cvi42®

v.6.2

DICOM Conformance Statement

circle CARDIOVASCULAR IMAGING

1 CONFORMANCE STATEMENT OVERVIEW

cvi42 is a vendor-independent workstation solution for comprehensive evaluation of Cardiovascular MR and CT images. It is designed to be used in clinical settings as well as for experimental and clinical research. **cvi42** has full functionality for viewing and simple measurements but is mostly focused on tools needed for clinical MR and CT, including short axis and long axis ventricular function analysis, myocardial tissue characterization, dynamic signal intensity analysis and evaluation of velocity encoded images and 4D volume visualization.

cvi42 supports several DICOM Service Classes, using the OFFIS DICOM Toolkit (DCMTK), to provide the following capabilities:

- Receive DICOM images and store them in the local system.
- Send DICOM images stored in the local system to a remote system.
- Query a PACS for particular studies and retrieve these studies for local storage.
- Read DICOM images from particular storage media and import them to the local system.
- Accept and process queries form remote DICOM applications for particular studies and send them to remote systems.

Table 1-1 provides an overview of the network services supported by cvi**42**. Table 1-2 lists all supported media services.

Table 1-1
NETWORK SERVICES

Networking SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
Computed Radiography Image Storage	Yes	Yes
CT Image Storage	Yes	Yes
Digital X-Ray Image Storage For Presentation	Yes	Yes
Digital X-Ray Image Storage For Processing	Yes	Yes
Enhanced CT Image Storage	Yes	Yes
Enhanced MR Image Storage	Yes	Yes
MR Image Storage	Yes	Yes
Multi-frame Single Bit SC Image Storage	Yes	Yes
Multi-frame Grayscale Byte SC Image Storage	Yes	Yes
Multi-frame Grayscale Word SC Image Storage	Yes	Yes
Multi-frame True Color SC Image Storage	Yes	Yes
Nuclear Medicine Image Storage	Yes	Yes
Encapsulated PDF Storage	Yes	Yes
Positron Emission Tomography Image Storage	Yes	Yes
Secondary Capture Image Storage	Yes	Yes
Surface Segmentation Object	Yes	Yes

Ultrasound Image Storage	Yes	Yes
Ultrasound Multi-frame Image Storage	Yes	Yes
X-Ray Angiographic Image Storage	Yes	Yes
Basic Text SR Storage	Yes	Yes
Query/Retrieve		
Study Root Query/Retrieve Information Model – FIND	Yes	Yes
Study Root Query/Retrieve Information Model – MOVE	Yes	Yes
Study Root Query/Retrieve Information Model – GET	Yes	No
Workflow Management		
Modality Worklist Information Model - FIND	Yes	No
Modality Performed Procedure Step SOP Class	Yes	No
Storage Commitment Push Model SOP Class	Yes	Yes

Table 1-2

MEDIA SERVICES

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
Compact Disc – Recordable		
Basic Cardiac X-Ray Angiographic Studies on CD-R Media	No	Yes
1024 X-Ray Angiographic Studies on CD-R Media	No	Yes
Ultrasound Single Frame for Image Display on CD-R	No	Yes
Ultrasound Multi-Frame for Image Display on CD-R	No	Yes
General Purpose CD-R Interchange	No	Yes
CT/MR Studies on CD-R	No	Yes
Digital Versatile Disc		
1024 X-Ray Angiographic Studies on DVD Media	No	Yes
CT/MR Studies on DVD Media	No	Yes
CT/MR Studies on DVD-RAM Media	No	Yes

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3 Introduction

This DICOM Conformance Statement specifies the behavior and functionality of the **cvi42** system, with regard to supported DICOM networking SOP Classes and Media Storage Application Profiles. **cvi42** is a workstation for comprehensive evaluation of Cardiovascular MR and CT images.

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3.1 Revision History

Document Version	Date of Issue	Author	Description
Version cmr42 2.1	2008-08-29	Jörg Riesmeier	Initial release of this document
Version cmr42 3.0	2009-09-26	Jörg Riesmeier	Added support for creating Secondary Capture images
Version cmr42 3.2	2010-06-14	Philipp Barckow	Added Anonymization Options
Version cmr42 3.3	2010-11-02	Shirantha Samarappuli	Document updated with 3.3 header (no changes to contents)
Version ct42 1.0	2011-04-19	Jörg Riesmeier	Added support for creating CT images
Version cvi42 4.0	2012-05-08	Philipp Barckow	Added support for creating MR images
Version cvi42 4.1	2013-04-16	Philipp Barckow	Added FIND-SCP, MOVE-SCP, GET-SCU, extended character set support
Version cvi42 5.0	2014-07-08	Philipp Barckow	Add additional attributes for removal during anonymization
Version cvi42 5.0	2014-09-04	Philipp Barckow	Add additional attributes for SOP generation
Version cvi42 5.1	2015-02-05	Shirantha Samarappuli	Version update, no changes to contents
Version cvi42 5.2	2015-09-11	Shirantha Samarappuli	Version update, no changes to contents
Version cvi42 5.3	2016-03-04	Philipp Barckow	Version update, added additional attributes for created SOP instances
Version cmr42 5.3	2016-08-16	Philipp Barckow	Add Philips private attribute for Inversion delay Time
Version cvi42 5.6	2017-02-24	Ronnie Louie	Version update, no changes to contents

Version cvi42 5.8	2017-10-20	Ronnie Louie	Version update, mailing address update, no changes to contents
Version cvi42 5.9	2018-03-09	Ronnie Louie	Version update, no changes to contents
Version cvi42 5.9	2018-03-29	Ben Park	Added STORAGE COMMITMENT-SCU/SCP, MPPS-SCU services
Version cvi42 5.9	2018-10-23	Lee Schnellback	Updated mailing address in section 3 and replaced logo on title page
Version cvi42 5.10	2018-11-30	Faustina Lu	Version update, no changes to contents
Version cvi42 5.11	2019-07-25	Ben Park	Version update. Updated Implementation Class UID and Implementation Version Name.
Version cvi42 5.12	2020-02-20	Ben Park	Updated properties for Specific Character Set.
Version cvi42 5.13	2020-07-21	Ben Park	Version update. Added Secondary Capture Device Software Version.
Version cvi42 5.13	2020-12-09	Ben Park	Updated Implementation Class UID and Implementation Version Name.
Version cvi42 5.13.5	2021-03-11	Ben Park	Updated CT/MR Image Module attributes.
Version cvi42 5.14.0	2022-03-14	Denny Abraham	Added support for Basic Text SR Storage.
Version cvi42 5.15.0	2022-08-03	Glen van de Mosselaer	Version update. Update Modules for Multi-Frame Secondary Capture IODs.
Version cvi42 5.16.0	2022-12-20	Randall Stafford	Version update. New GE inline processing support and Secondary Capture IODs.
Version cvi42 5.17.0	2023-03-21	Philmo Gu	Version Update. Added Source Image Sequence.
Version cvi42 6.0.0	2023-10-11	Elize Tran	Version Update. Added Window Center and Window Width for Grayscale SC. Updated Content Date anonymized value. Added Related Series Sequence tag to anonymization list.
Version cvi42 6.1.0	2024-04-22	Artem Knysh	Version update, no changes to contents
Version cvi42 6.1.2	2024-06-19	Derek Hann	Update company address
Version cvi42 6.2.0	2024-08-20	Philmo Gu	Version update. Added Image Comments and

			Referenced Image Sequence for created SOP instances.
Version cvi42 6.2.0	2024-11-28	Annik Olbrechts	Updated Series Description to Table 8.1-8 , Pixel Spacing to Table 8.1-13, and Acquisition Orientation, Phase Encoding Direction and Velocity Rescale to Table 8.2-7. Added Canon to Table 8.2-5.
Version cvi42 6.2.0	2024-12-03	Mostafa Vahedi	Added Surface Segmentation Object and Encapsulated PDF to tables 4.2-1, 4.2-6, 4.2-9, 4.2-13, and 5.2-2, and appendix sections 8.1.1.6, 8.1.1.7, 8.1.1.12, and 8.1.1.13
Version cvi42 6.2.0	2024-12-05	Shantanu Banik	Updated the Series Description field in Table 8.1-34
Version cvi42 6.2.1	2025-01-30	Valentin Zingan	Updated DICOM tags for created SOP instances
Version cvi42 6.2.2	2025-04-17	Rafael Bocaletto Maiolla	Added DICOM SR support

3.2 Audience

This document is written for the people that need to understand how **cvi42** will integrate into their healthcare facility. This includes both those responsible for overall imaging network policy and architecture, as well as integrators who need to have a detailed understanding of the DICOM features of the product. This document contains some basic DICOM definitions so that any reader may understand how this product implements DICOM features. However, integrators are expected to fully understand all the DICOM terminology, how the tables in this document relate to the product's functionality, and how that functionality integrates with other devices that support compatible DICOM features.

3.3 Remarks

The scope of this DICOM Conformance Statement is to facilitate integration between **cvi42** and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM Standard. DICOM by itself does not guarantee interoperability. The Conformance Statement does, however, facilitate a first-level comparison for interoperability between different applications supporting compatible DICOM functionality.

This Conformance Statement is not supposed to replace validation with other DICOM equipment to ensure proper exchange of intended information. In fact, the user should be aware of the following important issues:

- The comparison of different Conformance Statements is just the first step towards assessing interconnectivity and interoperability between the product and other DICOM conformant equipment.

- Test procedures should be defined and executed to validate the required level of interoperability with specific compatible DICOM equipment, as established by the healthcare facility.

3.4 Terms and Definitions

Informal definitions are provided for the following terms used in this Conformance Statement. The DICOM Standard [DICOM] is the authoritative source for formal definitions of these terms.

Abstract Syntax – the information agreed to be exchanged between applications, generally equivalent to a Service/Object Pair (SOP) Class. Examples: Verification SOP Class, Modality Worklist Information Model Find SOP Class, Computed Radiography Image Storage SOP Class.

Application Entity (AE) – an end point of a DICOM information exchange, including the DICOM network or media interface software; i. e., the software that sends or receives DICOM information objects or messages. A single device may have multiple Application Entities.

Application Entity Title – the externally known name of an Application Entity, used to identify a DICOM application to other DICOM applications on the network.

Application Context – the specification of the type of communication used between Application Entities. Example: DICOM network protocol.

Association – a network communication channel set up between Application Entities.

Attribute – a unit of information in an object definition; a data element identified by a tag. The information may be a complex data structure (Sequence), itself composed of lower level data elements. Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).

Information Object Definition (IOD) – the specified set of Attributes that comprise a type of data object; does not represent a specific instance of the data object, but rather a class of similar data objects that have the same properties. The Attributes may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C). Examples: MR Image IOD, CT Image IOD, Print Job IOD.

Joint Photographic Experts Group (JPEG) – a set of standardized image compression techniques, available for use by DICOM applications.

Media Application Profile – the specification of DICOM information objects and encoding exchanged on removable media (e. g., CDs)

Module – a set of Attributes within an Information Object Definition that are logically related to each other. Example: Patient Module includes Patient Name, Patient ID, Patient Birth Date, and Patient Sex.

Negotiation – first phase of Association establishment that allows Application Entities to agree on the types of data to be exchanged and how that data will be encoded.

Presentation Context – the set of DICOM network services used over an Association, as negotiated between Application Entities; includes Abstract Syntaxes and Transfer Syntaxes.

Protocol Data Unit (PDU) – a packet (piece) of a DICOM message sent across the network. Devices must specify the maximum size packet they can receive for DICOM messages.

Service Class Provider (SCP) – role of an Application Entity that provides a DICOM network service; typically, a server that performs operations requested by another Application Entity (Service Class User). Examples: Picture Archiving and Communication System (image storage SCP, and image query/retrieve SCP), Radiology Information System (modality worklist SCP).

Service Class User (SCU) – role of an Application Entity that uses a DICOM network service; typically, a client. Examples: imaging modality (image storage SCU, and modality worklist SCU), imaging workstation (image query/retrieve SCU)

Service/Object Pair (SOP) Class – the specification of the network or media transfer (service) of a particular type of data (object); the fundamental unit of DICOM interoperability specification. Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management.

Service/Object Pair (SOP) Instance – an information object; a specific occurrence of information exchanged in a SOP Class. Examples: a specific X-Ray image.

Tag – a 32-bit identifier for a data element, represented as a pair of four digit hexadecimal numbers, the "group" and the "element". If the "group" number is odd, the tag is for a private (manufacturer-specific) data element. Examples: (0010,0020) [Patient ID], (07FE,0010) [Pixel Data], (0019,0210) [private data element]

Transfer Syntax – the encoding used for exchange of DICOM information objects and messages. Examples: JPEG compressed (images), little endian explicit value representation.

Unique Identifier (UID) – a globally unique "dotted decimal" string that identifies a specific object or a class of objects; an ISO-8824 Object Identifier. Examples: Study Instance UID, SOP Class UID, SOP Instance UID.

Value Representation (VR) – the format type of an individual DICOM data element, such as text, an integer, a person's name, or a code. DICOM information objects can be transmitted with either explicit identification of the type of each data element (Explicit VR), or without explicit identification (Implicit VR); with Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element.

3.5 Basics of DICOM Communication

This section describes terminology used in this Conformance Statement for the non-specialist. The key terms used in the Conformance Statement are highlighted in italics below. This section is not a substitute for training about DICOM, and it makes many simplifications about the meanings of DICOM terms.

Two Application Entities (devices) that want to communicate with each other over a network using DICOM protocol must first agree on several things during an initial network "handshake". One of the two devices must initiate an Association (a connection to the other device), and ask if specific services, information, and encoding can be supported by the other device (Negotiation).

DICOM specifies a number of network services and types of information objects, each of which is called an Abstract Syntax for the Negotiation. DICOM also specifies a variety of methods for encoding data, denoted Transfer Syntaxes. The Negotiation allows the initiating Application Entity to propose combinations of Abstract Syntax and Transfer Syntax to be used on the Association; these combinations are called Presentation Contexts. The receiving Application Entity accepts the Presentation Contexts it supports.

For each Presentation Context, the Association Negotiation also allows the devices to agree on Roles – which one is the Service Class User (SCU - client) and which is the Service Class Provider (SCP - server). Normally the device initiating the connection is the SCU, i. e., the client system calls the server, but not always.

The Association Negotiation finally enables exchange of maximum network packet (PDU) size, security information, and network service options (called Extended Negotiation information).

The Application Entities, having negotiated the Association parameters, may now commence exchanging data. Common data exchanges include queries for worklists and lists of stored images, transfer of image objects and analyses (structured reports), and sending images to film printers. Each exchangeable unit of data is formatted by the sender in accordance with the appropriate Information Object Definition and sent using the negotiated Transfer Syntax. There is a Default Transfer Syntax that all systems must accept, but it may not be the most efficient for some use cases. Each transfer is explicitly acknowledged by the receiver with a Response Status indicating success, failure, or that query or retrieve operations are still in process.

Two Application Entities may also communicate with each other by exchanging media (such as a CD-R). Since there is no Association Negotiation possible, they both use a Media Application Profile that specifies “pre-negotiated” exchange media format, Abstract Syntax, and Transfer Syntax.

3.6 Abbreviations

The following list illustrates all abbreviations that are used in this document.

ACSE	Association Control Service Element
AE	Application Entity
CD-R	Compact Disc – Recordable
CT	Computed Tomography
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DVD	Digital Versatile Disc
FSC	File-Set Creator
FSR	File-Set Reader
FSU	File-Set Updater
IOD	Information Object Definition
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
ISO	International Standards Organization
JPEG	Joint Photographic Experts Group
MPPS	Modality Performed Procedure Step
MPR	Multiplanar Reconstruction
MWL	Modality Worklist
PACS	Picture Archiving and Communication System
PDU	Protocol Data Unit
SC	Secondary Capture
SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair
TCP/IP	Transmission Control Protocol / Internet Protocol
UID	Unique Identifier
US	Ultrasound

VM	Value Multiplicity
VR	Value Representation
XA	X-Ray Angiography

3.7 References

[DICOM] NEMA Standards Publication PS 3.1-18, Digital Imaging and Communications in Medicine (DICOM), 2009, available at http://medical.nema.org/

4 Networking

4.1 Implementation Model

4.1.1 Application Data Flow

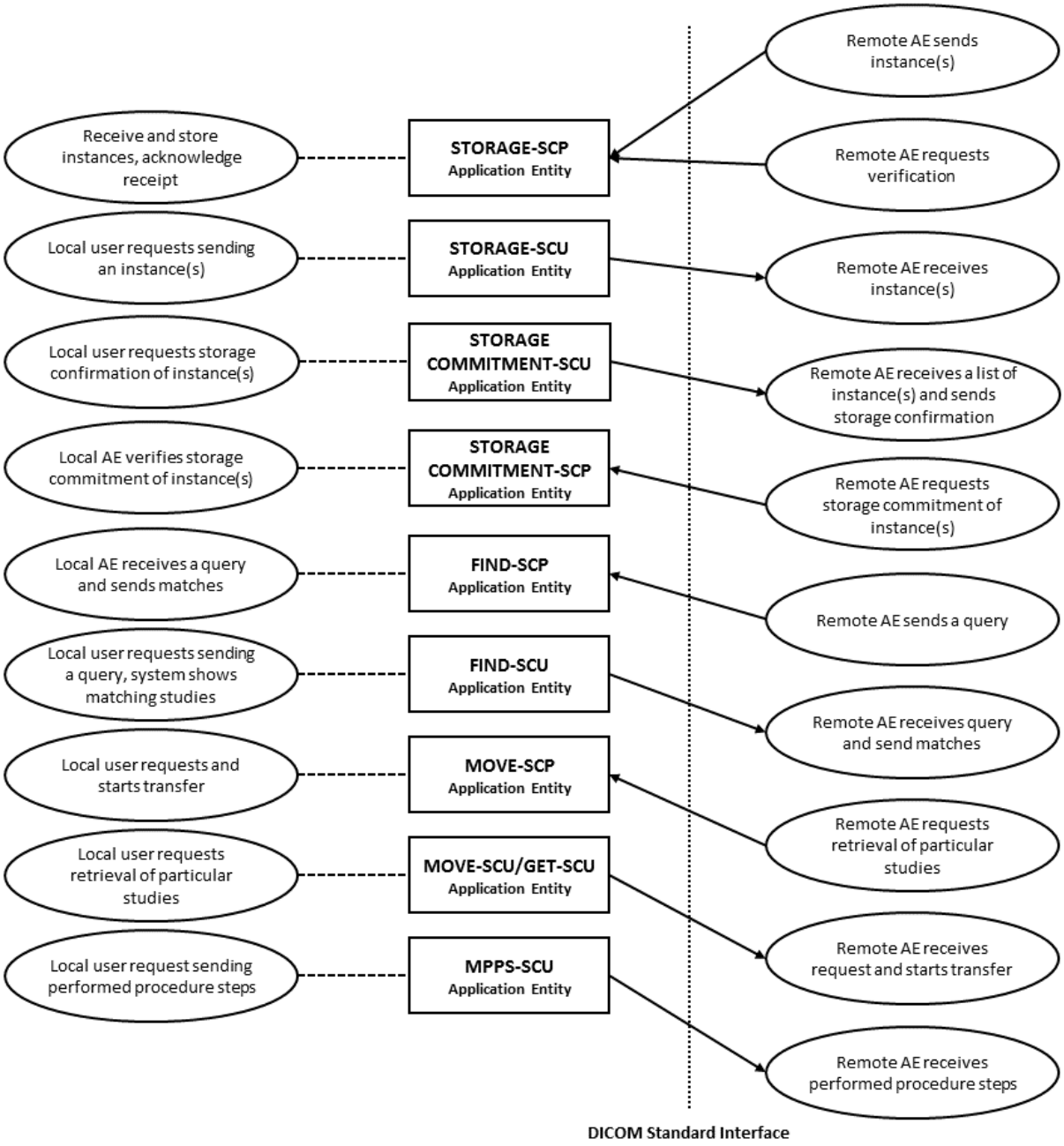

Figure 4-1. Application Data Flow Diagram

Conceptually, the networking services which are implemented in the **cvi42** system may be modeled as the following separate AEs.

4.1.2 Functional Definitions of AEs

4.1.2.1 STORAGE-SCP

STORAGE-SCP listens for connection requests at the port number configured for it. It will accept Presentation Contexts for Storage and Verification SOP Classes. Upon receipt of a Verification Request, STORAGE-SCP will respond with a successful Verification response. Upon receipt of a Storage Request, STORAGE-SCP will store the object that has been successfully received in the local system. The stored instances are subsequently listed and may be viewed through the user interface.

4.1.2.2 STORAGE-SCU

STORAGE-SCU is activated through the user interface when a user selects one or more instances from the local system and requests that they be sent to a remote AE. The remote AE is selected from a pre-configured list of communication partners.

4.1.2.3 STORAGE COMMITMENT-SCP

STORAGE COMMITMENT-SCP receives a list of instances from a remote AE and verifies the proper storage of all requested instances, creating a response message consisted of failed and succeeded instances. **cvi42** can either send back N-EVENT-REPORT requests on the same association from the previous N-ACTION request or create a new association request.

4.1.2.4 STORAGE COMMITMENT-SCU

STORAGE COMMITMENT-SCU ensures that previously sent images are properly stored in the remote AE. In **cvi42**, STORAGE COMMITMENT-SCU is triggered automatically after STORAGE-SCU finishes sending all images the remote AE. Users can adjust the number of retries and delay time between retries in the configuration.

4.1.2.5 FIND-SCP

cvi42 can act as a DICOM Q/R server. It answers Study Root Query/Retrieve Information Model queries from remote DICOM compatible applications. **cvi42** does not support Modality Worklist Information Model for FIND-SCP.

4.1.2.6 FIND-SCU

FIND-SCU is activated through the user interface when a user selects a remote AE (from a preconfigured list) and initiates a query on study level. Subsequently, the matching studies are presented to the user as a list from which studies can be selected for retrieval. **cvi42** supports Modality Worklist (MWL) Information Model for FIND-SCU. FIND-SCU for MWL is used in **cvi42** internally for querying scheduled procedure steps when loading a study.

4.1.2.7 MOVE-SCP

cvi42 can act as a DICOM server. It answers MOVE-SCP requests from remote DICOM compatible applications and sends requested images.

4.1.2.8 MOVE-SCU

MOVE-SCU is activated through the user interface when a user selects particular studies from a list for retrieval. A connection to the remote AE is established to initiate the retrieval. The STORAGE-SCP AE receives the retrieved instances and stores them in the local system.

4.1.2.9 GET-SCU

GET-SCU is activated through the user interface when a user selects particular studies from a list for retrieval, if the remote AE is configured for C-GET support.

4.1.2.10 MPPS-SCU

MPPS-SCU sends the status of a study to a remote MPPS-SCP. In **cvi42**, MPPS-SCU is triggered when loading and closing a study. When a user loads a study, MPPS-SCU sends an N-CREATE message with value “IN PROGRESS”. When a user closes the study, it sends an N-SET message with value “COMPLETED”.

4.1.3 Sequencing of Real-World Activities

All SCP activities are performed asynchronously in the background and are not dependent on any sequencing. The only limitation is that the STORAGE-SCP only accepts one association at a time if configured accordingly (which is the default behavior).

All SCU activities are initiated in the user interface. For each remote AE, a new background is started which allows for multiple associations at the same time.

4.2 AE Specifications

4.2.1 STORAGE-SCP

4.2.1.1 SOP Classes

STORAGE-SCP provides standard conformance to the following DICOM SOP classes.

Table 4.2-1

SOP CLASSES FOR AE STORAGE-SCP

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	No	Yes
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	No	Yes
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	No	Yes
Digital X-Ray Image Storage For Presentation	1.2.840.10008.5.1.4.1.1.1.1.1	No	Yes
Digital X-Ray Image Storage For Processing	1.2.840.10008.5.1.4.1.1.1.1	No	Yes
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	No	Yes
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	No	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	No	Yes
Multi-frame Single Bit SC Image Storage	1.2.840.10008.5.1.4.1.1.7.1	No	Yes
Multi-frame Grayscale Byte SC Image Storage	1.2.840.10008.5.1.4.1.1.7.2	No	Yes
Multi-frame Grayscale Word SC Image Storage	1.2.840.10008.5.1.4.1.1.7.3	No	Yes
Multi-frame True Color SC Image Storage	1.2.840.10008.5.1.4.1.1.7.4	No	Yes
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	No	Yes

Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	No	Yes
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	No	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	No	Yes
Surface Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.5	No	Yes
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	No	Yes
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	No	Yes
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	No	Yes
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	No	Yes

4.2.1.2 Association Policies

4.2.1.2.1 General

STORAGE-SCP accepts but never initiates associations. The DICOM standard application context name, which is always proposed, is:

Table 4.2-2

DICOM APPLICATION CONTEXT

Application context name	1.2.840.10008.3.1.1.1

The PDU size is in the range 4096 to 131072 bytes. The default is 16384 bytes.

SOP Class extended negotiation is not supported.

4.2.1.2.2 Number of Associations

Table 4.2-3

NUMBER OF ASSOCIATIONS AS AN ASSOCIATION ACCEPTOR FOR AE STORAGE-SCP

Maximum number of simultaneous associations	Depends on the configuration

4.2.1.2.3 Asynchronous Nature

Asynchronous mode of operation is not supported.

4.2.1.2.4 Implementation Identifying Information

Table 4.2-4

DICOM IMPLEMENTATION CLASS AND VERSION FOR AE STORAGE-SCP

Implementation Class UID	1.3.6.1.4.1.53684.1.0.3.6.5
Implementation Version Name	CVI42_DCMTK_365

4.2.1.3 Association Initiation Policy

STORAGE-SCP does not initiate associations.

4.2.1.4 Association Acceptance Policy

STORAGE-SCP accepts any association for which at least one presentation context is accepted. The calling and called application entity titles are ignored. The responding application entity name will

always be identical to the called application entity title which was specified by the remote AE. Association requests may be rejected with the following status codes and reasons.

Table 4.2-5

ASSOCIATION REJECTION REASONS

Result	Source	Reason	Description
Rejected permanent	Provider, presentation related	Temporary congestion	Resource limitation: process creation failed
Rejected transient	User	Application context name not supported	Incorrect application context name

4.2.1.4.1 Activity – Remote AE sends instance(s)

4.2.1.4.1.1 Description and Sequencing of Activities

As one instance is received from a remote AE, STORAGE-SCP will store this instance in the local file system and insert a record into the local database. If the received instance is a duplicate of a previously received instance, the new instance will be discarded.

4.2.1.4.1.2 Accepted Presentation Contexts

Table 4.2-6

ACCEPTABLE PRESENTATION CONTEXTS FOR AE STORAGE-SCP AND REAL-WORLD ACTIVITY 'REMOTE AE SENDS INSTANCE(S)'

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian, Deflated Explicit VR LE, RLE Lossless, JPEG Baseline (P1), JPEG Extended (P2+4), JPEG Lossless (P14SV1), JPEG 2000 Lossless, JPEG 2000 Lossy	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2, 1.2.840.10008.1.2.1.99, 1.2.840.10008.1.2.5, 1.2.840.10008.1.2.4.50, 1.2.840.10008.1.2.4.51, 1.2.840.10008.1.2.4.70, 1.2.840.10008.1.2.4.90, 1.2.840.10008.1.2.4.91	SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian, Deflated Explicit VR LE, RLE Lossless, JPEG Baseline (P1),	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2, 1.2.840.10008.1.2.1.99, 1.2.840.10008.1.2.5,	SCP	None

		JPEG Extended (P2+4), JPEG Lossless (P14SV1), JPEG 2000 Lossless, JPEG 2000 Lossy	1.2.840.10008.1.2.4.50 , 1.2.840.10008.1.2.4.51 , 1.2.840.10008.1.2.4.70 , 1.2.840.10008.1.2.4.90 , 1.2.840.10008.1.2.4.91		
Digital X-Ray Image Storage For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian, Deflated Explicit VR LE, RLE Lossless, JPEG Baseline (P1), JPEG Extended (P2+4), JPEG Lossless (P14SV1), JPEG 2000 Lossless, JPEG 2000 Lossy	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2, 1.2.840.10008.1.2.1.99 , 1.2.840.10008.1.2.5, 1.2.840.10008.1.2.4.50 , 1.2.840.10008.1.2.4.51 , 1.2.840.10008.1.2.4.70 , 1.2.840.10008.1.2.4.90 , 1.2.840.10008.1.2.4.91	SCP	None
Digital X-Ray Image Storage For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian, Deflated Explicit VR LE, RLE Lossless, JPEG Baseline (P1), JPEG Extended (P2+4), JPEG Lossless (P14SV1), JPEG 2000 Lossless, JPEG 2000 Lossy	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2, 1.2.840.10008.1.2.1.99 , 1.2.840.10008.1.2.5, 1.2.840.10008.1.2.4.50 , 1.2.840.10008.1.2.4.51 , 1.2.840.10008.1.2.4.70 , 1.2.840.10008.1.2.4.90 , 1.2.840.10008.1.2.4.91	SCP	None
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian, Deflated Explicit VR LE, RLE Lossless, JPEG Baseline (P1), JPEG Extended (P2+4), JPEG Lossless (P14SV1), JPEG 2000 Lossless, JPEG 2000 Lossy	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2, 1.2.840.10008.1.2.1.99 , 1.2.840.10008.1.2.5, 1.2.840.10008.1.2.4.50 , 1.2.840.10008.1.2.4.51 , 1.2.840.10008.1.2.4.70 ,	SCP	None

			1.2.840.10008.1.2.4.90 , 1.2.840.10008.1.2.4.91		
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian, Deflated Explicit VR LE, RLE Lossless, JPEG Baseline (P1), JPEG Extended (P2+4), JPEG Lossless (P14SV1), JPEG 2000 Lossless, JPEG 2000 Lossy	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2, 1.2.840.10008.1.2.1.99 , 1.2.840.10008.1.2.5, 1.2.840.10008.1.2.4.50 , 1.2.840.10008.1.2.4.51 , 1.2.840.10008.1.2.4.70 , 1.2.840.10008.1.2.4.90 , 1.2.840.10008.1.2.4.91	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian, Deflated Explicit VR LE, RLE Lossless, JPEG Baseline (P1), JPEG Extended (P2+4), JPEG Lossless (P14SV1), JPEG 2000 Lossless, JPEG 2000 Lossy	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2, 1.2.840.10008.1.2.1.99 , 1.2.840.10008.1.2.5, 1.2.840.10008.1.2.4.50 , 1.2.840.10008.1.2.4.51 , 1.2.840.10008.1.2.4.70 , 1.2.840.10008.1.2.4.90 , 1.2.840.10008.1.2.4.91	SCP	None
Multi-frame Single Bit SC Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian, Deflated Explicit VR LE, RLE Lossless, JPEG Baseline (P1), JPEG Extended (P2+4), JPEG Lossless (P14SV1), JPEG 2000 Lossless, JPEG 2000 Lossy	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2, 1.2.840.10008.1.2.1.99 , 1.2.840.10008.1.2.5, 1.2.840.10008.1.2.4.50 , 1.2.840.10008.1.2.4.51 , 1.2.840.10008.1.2.4.70 , 1.2.840.10008.1.2.4.90 , 1.2.840.10008.1.2.4.91	SCP	None
Multi-frame Grayscale	1.2.840.10008.5.1.4.1.1.7.2	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian,	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2,	SCP	None

Byte SC Image Storage		Deflated Explicit VR LE, RLE Lossless, JPEG Baseline (P1), JPEG Extended (P2+4), JPEG Lossless (P14SV1), JPEG 2000 Lossless, JPEG 2000 Lossy	1.2.840.10008.1.2.1.99 , 1.2.840.10008.1.2.5, 1.2.840.10008.1.2.4.50 , 1.2.840.10008.1.2.4.51 , 1.2.840.10008.1.2.4.70 , 1.2.840.10008.1.2.4.90 , 1.2.840.10008.1.2.4.91		
Multi-frame Grayscale Word SC Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian, Deflated Explicit VR LE, RLE Lossless, JPEG Baseline (P1), JPEG Extended (P2+4), JPEG Lossless (P14SV1), JPEG 2000 Lossless, JPEG 2000 Lossy	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2, 1.2.840.10008.1.2.1.99 , 1.2.840.10008.1.2.5, 1.2.840.10008.1.2.4.50 , 1.2.840.10008.1.2.4.51 , 1.2.840.10008.1.2.4.70 , 1.2.840.10008.1.2.4.90 , 1.2.840.10008.1.2.4.91	SCP	None
Multi-frame True Color SC Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian, Deflated Explicit VR LE, RLE Lossless, JPEG Baseline (P1), JPEG Extended (P2+4), JPEG Lossless (P14SV1), JPEG 2000 Lossless, JPEG 2000 Lossy	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2, 1.2.840.10008.1.2.1.99 , 1.2.840.10008.1.2.5, 1.2.840.10008.1.2.4.50 , 1.2.840.10008.1.2.4.51 , 1.2.840.10008.1.2.4.70 , 1.2.840.10008.1.2.4.90 , 1.2.840.10008.1.2.4.91	SCP	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian, Deflated Explicit VR LE, RLE Lossless, JPEG Baseline (P1), JPEG Extended (P2+4), JPEG Lossless (P14SV1), JPEG 2000 Lossless,	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2, 1.2.840.10008.1.2.1.99 , 1.2.840.10008.1.2.5, 1.2.840.10008.1.2.4.50 ,	SCP	None

		JPEG 2000 Lossy	1.2.840.10008.1.2.4.51, 1.2.840.10008.1.2.4.70, 1.2.840.10008.1.2.4.90, 1.2.840.10008.1.2.4.91		
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian, Deflated Explicit VR LE, RLE Lossless	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2, 1.2.840.10008.1.2.1.99, 1.2.840.10008.1.2.5	SCP	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian, Deflated Explicit VR LE, RLE Lossless, JPEG Baseline (P1), JPEG Extended (P2+4), JPEG Lossless (P14SV1), JPEG 2000 Lossless, JPEG 2000 Lossy	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2, 1.2.840.10008.1.2.1.99, 1.2.840.10008.1.2.5, 1.2.840.10008.1.2.4.50, 1.2.840.10008.1.2.4.51, 1.2.840.10008.1.2.4.70, 1.2.840.10008.1.2.4.90, 1.2.840.10008.1.2.4.91	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian, Deflated Explicit VR LE, RLE Lossless, JPEG Baseline (P1), JPEG Extended (P2+4), JPEG Lossless (P14SV1), JPEG 2000 Lossless, JPEG 2000 Lossy	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2, 1.2.840.10008.1.2.1.99, 1.2.840.10008.1.2.5, 1.2.840.10008.1.2.4.50, 1.2.840.10008.1.2.4.51, 1.2.840.10008.1.2.4.70, 1.2.840.10008.1.2.4.90, 1.2.840.10008.1.2.4.91	SCP	None
Surface Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.5	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian, Deflated Explicit VR LE, RLE Lossless	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2, 1.2.840.10008.1.2.1.99	SCP	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian,	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2,	SCP	None

		Deflated Explicit VR LE, RLE Lossless, JPEG Baseline (P1), JPEG Extended (P2+4), JPEG Lossless (P14SV1), JPEG 2000 Lossless, JPEG 2000 Lossy	1.2.840.10008.1.2.1.99 , 1.2.840.10008.1.2.5, 1.2.840.10008.1.2.4.50 , 1.2.840.10008.1.2.4.51 , 1.2.840.10008.1.2.4.70 , 1.2.840.10008.1.2.4.90 , 1.2.840.10008.1.2.4.91		
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian, Deflated Explicit VR LE, RLE Lossless, JPEG Baseline (P1), JPEG Extended (P2+4), JPEG Lossless (P14SV1), JPEG 2000 Lossless, JPEG 2000 Lossy	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2, 1.2.840.10008.1.2.1.99 , 1.2.840.10008.1.2.5, 1.2.840.10008.1.2.4.50 , 1.2.840.10008.1.2.4.51 , 1.2.840.10008.1.2.4.70 , 1.2.840.10008.1.2.4.90 , 1.2.840.10008.1.2.4.91	SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian, Deflated Explicit VR LE, RLE Lossless, JPEG Baseline (P1), JPEG Extended (P2+4), JPEG Lossless (P14SV1), JPEG 2000 Lossless, JPEG 2000 Lossy	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2, 1.2.840.10008.1.2.1.99 , 1.2.840.10008.1.2.5, 1.2.840.10008.1.2.4.50 , 1.2.840.10008.1.2.4.51 , 1.2.840.10008.1.2.4.70 , 1.2.840.10008.1.2.4.90 , 1.2.840.10008.1.2.4.91	SCP	None
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian,	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCP	None

4.2.1.4.1.2.1 Extended Negotiation

No extended negotiation is performed.

4.2.1.4.1.3 SOP Specific Conformance

4.2.1.4.1.3.1 SOP Specific Conformance to Storage SOP Classes

STORAGE-SCP provides standard conformance to the Storage Service Class.

STORAGE-SCP will receive any supported DICOM instances transmitted on the open association provided that the correct presentation context is used. If an instance is received successfully, it is stored on the local file system and a record is inserted in the local database. For all supported storage SOP classes, no integrity checks of the received instances are performed beyond tests of a very basic structural integrity. In particular, the sending system is not prevented from transmitting incomplete or incorrect IODs. When storing an instance in the local system, group length values and sequence lengths of an instance are re-computed by STORAGE-SCP; these values may, therefore, be changed.

4.2.1.4.1.3.2 Presentation Context Acceptance Criterion

STORAGE-SCP will accept all presentation contexts which contain one of the supported SOP classes and one of the supported transfer syntaxes.

4.2.1.4.1.3.3 Transfer Syntax Selection Policies

In case of uncompressed transmission, the default behavior of STORAGE-SCP is to select for each presentation context containing a supported SOP class the explicit VR transfer syntax with the byte order matching the local machine byte order. If this transfer syntax is not available, the explicit VR transfer syntax with opposite byte order is selected. If this is also unavailable, implicit VR little endian is selected if available, otherwise the presentation context is rejected.

4.2.1.4.1.3.4 Response Status

STORAGE-SCP will behave as described in the Table below when generating the C-STORE response command message.

Table 4.2-7

RESPONSE STATUS FOR AE STORAGE-SCP AND
REAL-WORLD ACTIVITY 'REMOTE AE SENDS INSTANCE(S)'

Service Status	Further Meaning	Error Code	Behavior
Refused	Out of resources	A700	Application out of memory, file system or database write error (e. g. disk full or missing rights). The DICOM instance was not stored. An error message is output to the service logs.
Error	Data set does not match SOP class	A900	The SOP Class UID or SOP Instance UID in the C-STORE-RQ does not match the corresponding UID in the received dataset. The DICOM instance was stored anyway. An error message is output to the service logs.
	Cannot understand	C000	The received DICOM instance did not include a SOP Class UID or SOP Instance UID. The DICOM instance was stored anyway. An error message is output to the service logs.
Warning	Coercion of Data Elements	B000	Never sent, no coercion is ever performed.
	Data Set does not match SOP Class	B007	Never sent.

	Elements Discarded	B006	Never sent.
Success	Success	0000	The DICOM instance was successfully received and stored in the local system.

4.2.1.4.2 Activity – Remote AE requests Verification

4.2.1.4.2.1 Description and Sequencing of Activities

A remote AE sends an Echo Request to verify that STORAGE-SCP is awake and listening. STORAGE-SCP responds with success status as long as the request can be parsed.

4.2.1.4.2.2 Accepted Presentation Contexts

Table 4.2-8

ACCEPTABLE PRESENTATION CONTEXTS FOR AE STORAGE-SCP AND REAL-WORLD ACTIVITY 'REMOTE AE REQUESTS VERIFICATION'

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCP	None

4.2.1.4.2.2.1 Extended Negotiation

No extended negotiation is performed.

4.2.1.4.2.3 SOP Specific Conformance

4.2.1.4.2.3.1 SOP Specific Conformance to Verification SOP Classes

STORAGE-SCP provides standard conformance to the Verification Service Class.

4.2.1.4.2.3.2 Presentation Context Acceptance Criterion

STORAGE-SCP will accept all presentation contexts which contain the supported SOP class and one of the supported transfer syntaxes.

4.2.1.4.2.3.3 Transfer Syntax Selection Policies

The default behavior of STORAGE-SCP is to select for each presentation context containing a supported SOP class the explicit VR transfer syntax with the byte order matching the local machine byte order. If this transfer syntax is not available, the explicit VR transfer syntax with opposite byte order is selected. If this is also unavailable, implicit VR little endian is selected if available, otherwise the presentation context is rejected.

4.2.2 STORAGE-SCU

4.2.2.1 SOP Classes

STORAGE-SCU provides standard conformance to the following DICOM SOP classes.

Table 4.2-9

SOP CLASSES FOR AE STORAGE-SCU

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	Yes	No
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes	No
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	No
Digital X-Ray Image Storage For Presentation	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	No
Digital X-Ray Image Storage For Processing	1.2.840.10008.5.1.4.1.1.1.1	Yes	No
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Yes	No
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Yes	No
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	No
Multi-frame Single Bit SC Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Yes	No
Multi-frame Grayscale Byte SC Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Yes	No
Multi-frame Grayscale Word SC Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Yes	No
Multi-frame True Color SC Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Yes	No
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Yes	No
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Yes	No
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Yes	No
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	No
Surface Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.5	Yes	No
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes	No
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	No
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	No
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	Yes	No

4.2.2.2 Association Policies

4.2.2.2.1 General

STORAGE-SCU initiates but never accepts associations. The DICOM standard application context name, which is always proposed, is:

Table 4.2-10

DICOM APPLICATION CONTEXT

Application context name	1.2.840.10008.3.1.1.1

The PDU size is in the range 4096 to 131072 bytes. The default is 16384 bytes.

SOP Class extended negotiation is not supported.

4.2.2.2.2 Number of Associations

Table 4.2-11

NUMBER OF ASSOCIATIONS AS AN ASSOCIATION INITIATOR FOR AE STORAGE-SCU

Maximum number of simultaneous associations	Dependent on system specifications

4.2.2.2.3 Asynchronous Nature

Asynchronous mode of operation is not supported.

4.2.2.2.4 Implementation Identifying Information

Table 4.2-12

DICOM IMPLEMENTATION CLASS AND VERSION FOR AE STORAGE-SCU

Implementation Class UID	1.3.6.1.4.1.53684.1.0.3.6.5
Implementation Version Name	CVI42_DCMTK_365

4.2.2.3 Association Initiation Policy

STORAGE-SCU attempts to initiate a new association each time the user requests to send a group of instances. In case a large number of instances are to be sent, multiple subsequent associations are initiated each used to send only a part of the instances.

4.2.2.3.1 Activity – Local user requests sending instance(s)

4.2.2.3.1.1 Description and Sequencing of Activities

For each group of instances selected from the user interface to be transferred, a single attempt will be made to transmit it to the selected remote AE. If the send fails, no retry will be performed but an error message will be reported to the user.

4.2.2.3.1.2 Proposed Presentation Contexts

Table 4.2-13

PROPOSED PRESENTATION CONTEXTS FOR AE STORAGE-SCU AND
REAL-WORLD ACTIVITY 'LOCAL USER REQUESTS SENDING INSTANCE(S)'

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	JPEG Baseline (P1)	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Lossless (P14SV1)	1.2.840.10008.1.2.4.70	SCU	None
		Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	JPEG Baseline (P1)	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Lossless (P14SV1)	1.2.840.10008.1.2.4.70	SCU	None
		Implicit VR Little Endian,	1.2.840.10008.1.2,	SCU	None

		Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2		
Digital X-Ray Image Storage For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	JPEG Baseline (P1)	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Lossless (P14SV1)	1.2.840.10008.1.2.4.70	SCU	None
		Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	JPEG Baseline (P1)	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Lossless (P14SV1)	1.2.840.10008.1.2.4.70	SCU	None
		Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	JPEG Baseline (P1)	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Lossless (P14SV1)	1.2.840.10008.1.2.4.70	SCU	None
		Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None
Multi-frame Single Bit SC Image Storage	1.2.840.10008.5.1.4.1.1.7.1	JPEG Baseline (P1)	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Lossless (P14SV1)	1.2.840.10008.1.2.4.70	SCU	None
		Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None
Multi-frame Grayscale Byte SC Image Storage	1.2.840.10008.5.1.4.1.1.7.2	JPEG Baseline (P1)	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Lossless (P14SV1)	1.2.840.10008.1.2.4.70	SCU	None
		Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None
Multi-frame Grayscale Word SC Image Storage	1.2.840.10008.5.1.4.1.1.7.3	JPEG Baseline (P1)	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Lossless (P14SV1)	1.2.840.10008.1.2.4.70	SCU	None
		Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None
Multi-frame True Color SC Image Storage	1.2.840.10008.5.1.4.1.1.7.4	JPEG Baseline (P1)	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Lossless (P14SV1)	1.2.840.10008.1.2.4.70	SCU	None
		Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	JPEG Baseline (P1)	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Lossless (P14SV1)	1.2.840.10008.1.2.4.70	SCU	None
		Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None

Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian, Deflated Explicit VR LE, RLE Lossless	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2, 1.2.840.10008.1.2.1.99, 1.2.840.10008.1.2.5	SCU	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	JPEG Baseline (P1)	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Lossless (P14SV1)	1.2.840.10008.1.2.4.70	SCU	None
		Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	JPEG Baseline (P1)	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Lossless (P14SV1)	1.2.840.10008.1.2.4.70	SCU	None
		Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None
Surface Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.5	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian, Deflated Explicit VR LE, RLE Lossless	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2, 1.2.840.10008.1.2.1.99, 1.2.840.10008.1.2.5	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	JPEG Baseline (P1)	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Lossless (P14SV1)	1.2.840.10008.1.2.4.70	SCU	None
		RLE Lossless	1.2.840.10008.1.2.5	SCU	None
		Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	JPEG Baseline (P1)	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Lossless (P14SV1)	1.2.840.10008.1.2.4.70	SCU	None
		RLE Lossless	1.2.840.10008.1.2.5	SCU	None
		Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	JPEG Baseline (P1)	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Lossless (P14SV1)	1.2.840.10008.1.2.4.70	SCU	None
		Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None

STORAGE-SCU will always propose all Presentation Contexts, independently of the instances that are to be sent.

4.2.2.3.1.2.1 Extended Negotiation

No extended negotiation is performed.

4.2.2.3.1.3 SOP Specific Conformance

4.2.2.3.1.3.1 SOP Specific Conformance to Storage SOP Classes

STORAGE-SCU provides standard conformance to the Storage Service Class.

4.2.2.3.1.3.2 Presentation Context Acceptance Criterion

STORAGE-SCU does not accept associations.

4.2.2.3.1.3.3 Transfer Syntax Selection Policies

If offered a choice of transfer syntaxes in the accepted presentation contexts, the default behavior of STORAGE-SCU is to prefer the transfer syntax that is used for the DICOM file stored on the local system. If this transfer syntax is not available, an explicit VR uncompressed transfer syntax is selected. If this is also unavailable, implicit VR little endian is selected. Finally, any matching presentation context is accepted independent of the transfer syntax.

The default behavior may be modified by changing the configuration of STORAGE-SCU.

4.2.2.3.1.3.4 Response Status

STORAGE-SCU will behave as described in the Table below when receiving the C-STORE response command message.

Table 4.2-14

RESPONSE STATUS HANDLING BEHAVIOR FOR AE STORAGE-SCU AND REAL-WORLD ACTIVITY 'LOCAL USER REQUESTS SENDING INSTANCE(S)'

Service Status	Further Meaning	Error Code	Behavior
Refused	Out of resources	A7xx	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
Error	Data set does not match SOP class	A9xx	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
	Cannot understand	Cxxx	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
Warning		Bxxx	Transmission of the DICOM instance is considered successful. A warning message is output to the service logs. No message is posted to the user interface.
Success		0000	The DICOM instance was successfully received by the remote AE. No message is reported to the service logs or posted to the user interface.

Table 4.2-15

COMMUNICATION FAILURE BEHAVIOR FOR AE STORAGE-SCU AND
REAL-WORLD ACTIVITY 'LOCAL USER REQUESTS SENDING INSTANCE(S)'

Exception	Behavior
TCP/IP connection could not be established within the specified time range (configurable parameter).	An error message is reported to both the service logs and to the user interface.
ASCE response message could not be received within the specified time range (configurable parameter).	An error message is reported to both the service logs and to the user interface.
DIMSE response message could not be received within the specified time range (configurable parameter).	An error message is reported to both the service logs and to the user interface.
Association aborted by the SCP using A-ABORT or the network layers indicate communication loss (i. e. low-level TCP/IP socket closure)	An error message is reported to both the service logs and to the user interface.

4.2.2.4 Association Acceptance Policy

STORAGE-SCU does not accept associations.

4.2.3 STORAGE COMMITMENT-SCP

4.2.3.1 SOP Classes

STORAGE COMMITMENT-SCP provides standard conformance to the following DICOM SOP classes.

Table 4.2-16
SOP CLASSES FOR AE STORAGE COMMITMENT-SCP

SOP Class Name	SOP Class UID	SCU	SCP
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	No	Yes

4.2.3.2 Association Policies

4.2.3.2.1 General

STORAGE COMMITMENT-SCP accepts associations and supports both synchronous and asynchronous mode for sending response messages depending on the remote AE's behavior. The DICOM standard application context name, which is always proposed, is:

Table 4.2-17
DICOM APPLICATION CONTEXT

Application context name	1.2.840.10008.3.1.1.1

The PDU size is in the range 4096 to 131072 bytes. The default is 16384 bytes.

SOP Class extended negotiation is not supported.

4.2.3.2.2 Number of Associations

Table 4.2-18

NUMBER OF ASSOCIATIONS AS AN ASSOCIATION ACCEPTOR STORAGE COMMITMENT-SCP

Maximum number of simultaneous associations	Dependent on system specifications

4.2.3.2.3 Asynchronous Nature

STORAGE COMMITMENT-SCP may initiate a new association request if the remote AE releases the previous association. When **cvi42** completes the verification storage commitment of requested files, it creates a new association if required prior to sending N-EVENT-REPORT request. If the remote AE does not release the previous association, **cvi42** sends N-EVENT-REPORT request on the same association.

4.2.3.2.4 Implementation Identifying Information

Table 4.2-19

DICOM IMPLEMENTATION CLASS AND VERSION FOR AE STORAGE COMMITMENT-SCP

Implementation Class UID	1.3.6.1.4.1.53684.1.0.3.6.5
Implementation Version Name	CVI42_DCMTK_365

4.2.3.3 Association Initiation Policy

STORAGE COMMITMENT-SCP may initiate a new association if a remote AE releases an association after receiving N-ACTON-RSP. Please refer to 4.2.3.3 for the association initiation policy as the contents are identical.

4.2.3.4 Association Acceptance Policy

STORAGE COMMITMENT-SCP accepts any association for which at least one presentation context is accepted. Association requests may be rejected with the following status codes and reasons.

Table 4.2-20

ASSOCIATION REJECTION REASONS

Result	Source	Reason	Description
Rejected permanent	Provider, presentation related	Temporary congestion	Resource limitation: process creation failed
Rejected transient	User	Application context name not supported	Incorrect application context name

4.2.3.4.1 Activity – Remote AE requests storage commitment of instances

4.2.3.4.1.1 Description and Sequencing of Activities

As storage commitment request is received from a remote AE, STORAGE COMMITMENT-SCP will process the request and send a response to the remote system.
There are two steps in sending a response. First, STORAGE COMMITMENT-SCP sends N-ACTION response which is an acknowledgement of the request. Then after having processed all requests, an N-EVENT-REPORT request is sent which includes the processed dataset.

4.2.3.4.1.2 Accepted Presentation Contexts

Table 4.2-21

ACCEPTED PRESENTATION CONTEXTS FOR AE STORAGE COMMITMENT-SCP

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCP	None

4.2.3.4.1.2.1 Extended Negotiation

No extended negotiation is performed.

4.2.3.4.1.3 SOP Specific Conformance

4.2.3.4.1.3.1 SOP Specific Conformance to Storage Commitment Push Model SOP Classes

STORAGE COMMITMENT-SCP provides standard conformance to the Storage Commitment Service Class.

4.2.3.4.1.3.2 Response Status

STORAGE COMMITMENT-SCP will behave as described in the Table below, when generating the C-FIND response message.

Table 4.2-22

RESPONSE STATUS HANDLING BEHAVIOR FOR AE STORAGE COMMITMENT-SCP

Service Status	Further Meaning	Error Code	Behavior
Refused	Out of resources	A7xx	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
Error	Data set does not match SOP class	A9xx	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
	Cannot understand	Cxxx	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
Success		0000	The DICOM Storage Commitment response message was successfully received by the remote AE. No message is reported to the service logs or posted to the user interface.

4.2.4 STORAGE COMMITMENT-SCU

4.2.4.1 SOP Classes

STORAGE COMMITMENT-SCU provides standard conformance to the following DICOM SOP classes.

Table 4.2-23

SOP CLASSES FOR AE STORAGE COMMITMENT-SCU

SOP Class Name	SOP Class UID	SCU	SCP
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No

4.2.4.2 Association Policies

4.2.4.2.1 General

STORAGE COMMITMENT-SCU initiates but never accepts associations. The DICOM standard application context name, which is always proposed, is:

Table 4.2-24

DICOM APPLICATION CONTEXT

Application context name	1.2.840.10008.3.1.1.1

The PDU size is in the range 4096 to 131072 bytes. The default is 16384 bytes.

SOP Class extended negotiation is not supported.

4.2.4.2.2 Number of Associations

Table 4.2-25

NUMBER OF ASSOCIATIONS AS AN ASSOCIATION INITIATOR FOR AE STORAGE COMMITMENT-SCU

Maximum number of simultaneous associations	Dependent on system specifications

4.2.4.2.3 Asynchronous Nature

Asynchronous mode of operation is not supported.

4.2.4.2.4 Implementation Identifying Information

Table 4.2-26

DICOM IMPLEMENTATION CLASS AND VERSION FOR AE STORAGE-SCU

Implementation Class UID	1.3.6.1.4.1.53684.1.0.3.6.5
Implementation Version Name	CVI42_DCMTK_365

4.2.4.3 Association Initiation Policy

STORAGE COMMITMENT-SCU attempts to initiate a new association after each time the user has sent a group of instances using STORAGE-SCU application entity.

4.2.4.3.1 Activity –Local user requests storage confirmation of instance(s)

4.2.4.3.1.1 Description and Sequencing of Activities

After the user successfully sends a group of instances to a remote AE, STORAGE COMMITMENT-SCU will be invoked by transmitting a list that contains the group of instances previously sent. Retries will be performed based on the configuration parameters. User will be reported with a list of unsuccessful transmissions.

4.2.4.3.1.2 Proposed Presentation Contexts

Table 4.2-27

PROPOSED PRESENTATION CONTEXTS FOR AE STORAGE COMMITMENT-SCU AND REAL-WORLD ACTIVITY 'LOCAL USER REQUESTS STORAGE CONFIRMATION OF INSTANCES'

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None

STORAGE COMMITMENT-SCU will always propose all Presentation Contexts, independently of the instances that are to be sent.

4.2.4.3.1.2.1 Extended Negotiation

No extended negotiation is performed.

4.2.4.3.1.3 SOP Specific Conformance

4.2.4.3.1.3.1 SOP Specific Conformance to Storage Commitment Push Model SOP Classes

STORAGE COMMITMENT-SCU provides standard conformance to the Storage Commitment Service Class.

4.2.4.3.1.3.2 Presentation Context Acceptance Criterion

STORAGE COMMITMENT-SCU does not accept associations.

4.2.4.3.1.3.3 Transfer Syntax Selection Policies

The default preferred transfer syntax is either explicit VR little endian or explicit VR big endian depending on the byte order of the local system. If this is unavailable, implicit VR little endian is selected.

4.2.4.3.1.3.4 Response Status

STORAGE COMMITMENT-SCU will behave as described in the Table below when receiving the N-EVENT-REPORT response command message.

Table 4.2-28

RESPONSE STATUS HANDLING BEHAVIOR FOR AE STORAGE COMMITMENT-SCU AND REAL-WORLD ACTIVITY 'LOCAL USER REQUESTS STORAGE CONFIRMATION OF INSTANCES'

Service Status	Further Meaning	Error Code	Behavior
Refused	Syntax error	01	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
Error	Input file errors	2x	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
	Output file errors	4x	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
	Network errors	6x	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
Success		00	The list of DICOM Instance(s) was successfully stored or not stored at the remote AE If there are instances not properly stored, a message is reported to the service logs or posted to the user interface.

4.2.4.4 Association Acceptance Policy

In **cvi42**, STORAGE COMMITMENT-SCU does not accept new associations and is expected to receive N-EVENT-REPORT request on the same association as N-ACTION.

4.2.5 FIND-SCU

4.2.5.1 SOP Classes

FIND-SCU provides standard conformance to the following DICOM SOP classes.

Table 4.2-29

SOP CLASSES FOR AE FIND-SCU

SOP Class Name	SOP Class UID	SCU	SCP
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	No
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Yes	No

4.2.5.2 Association Policies

4.2.5.2.1 General

FIND-SCU initiates but never accepts associations. The DICOM standard application context name, which is always proposed, is:

Table 4.2-30

DICOM APPLICATION CONTEXT

Application context name	1.2.840.10008.3.1.1.1

The PDU size is in the range 4096 to 131072 bytes. The default is 16384 bytes.

SOP Class extended negotiation is not supported.

4.2.5.2.2 Number of Associations

Table 4.2-31

NUMBER OF ASSOCIATIONS AS AN ASSOCIATION INITIATOR FOR AE FIND-SCU

Maximum number of simultaneous associations	1

4.2.5.2.3 Asynchronous Nature

Asynchronous mode of operation is not supported.

4.2.5.2.4 Implementation Identifying Information

Table 4.2-32

DICOM IMPLEMENTATION CLASS AND VERSION FOR AE FIND-SCU

Implementation Class UID	1.3.6.1.4.1.53684.1.0.3.6.5
Implementation Version Name	CVI42_DCMTK_365

4.2.5.3 Association Initiation Policy

FIND-SCU attempts to initiate a new association each time the user requests sending a query.

4.2.5.3.1 Activity – Local user requests sending a query

4.2.5.3.1.1 Description and Sequencing of Activities

A single attempt will be made to query the remote AE. If the query fails, no retry will be performed but an error message will be reported to the user. In case no error occurs, the result of the query is presented to the user as a list of studies.

4.2.5.3.1.2 Proposed Presentation Contexts

Table 4.2-33

PROPOSED PRESENTATION CONTEXTS FOR AE FIND-SCU AND
REAL-WORLD ACTIVITY 'LOCAL USER REQUESTS SENDING A QUERY'

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
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, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None

Modality Worklist Information Model – FIND[1]	1.2.840.10008 .5.1.4.31	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None

By default, FIND-SCU will propose all uncompressed transfer syntaxes with local byte ordering first.

4.2.5.3.1.2.1 Extended Negotiation

No extended negotiation is performed. In particular, relational queries are not supported.

4.2.5.3.1.3 SOP Specific Conformance

4.2.5.3.1.3.1 SOP Specific Conformance to C-FIND SOP Classes

FIND-SCU provides standard conformance to the supported C-FIND SOP Class.

Only a single information model, Study Root, is supported. All queries are initiated at the highest level of the information model (the STUDY level). No C-CANCEL requests are ever issued.

Unexpected attributes returned in a C-FIND response (those not requested) are not shown to the user but reported to the service logs. Requested return attributes not returned by the SCP are ignored and left blank in the list on the user interface. Non-matching responses returned by the SCP due to unsupported matching keys are not filtered locally by the FIND-SCU and, thus, will still be presented in the list. No attempt is made to filter out duplicate responses.

Table 4.2-34
STUDY ROOT REQUEST IDENTIFIER FOR AE FIND-SCU

Attribute Name	Tag	Types of Matching
Specific Character Set	(0008,0005)	Single Value
Study Date	(0008,0020)	Universal, Single Value
Accession Number	(0008, 0050)	Universal, Wildcard
Modalities in Study	(0008,0061)	Single Value
Study Description	(0008,1030)	Universal, Wildcard
Patient's Name	(0010,0010)	Universal, Wildcard
Patient's ID	(0010,0020)	Universal, Wildcard
Patient's Birth Date	(0010,0030)	Universal, Single Value
Patient's Sex	(0010,0040)	Single Value
Study Instance UID	(0020,000D)	Single Value

At least one of the listed attributes must be supplied with a non-empty value in order for the query to be sent.

4.2.5.3.1.3.2 Presentation Context Acceptance Criterion

FIND-SCU does not accept associations.

4.2.5.3.1.3.3 Transfer Syntax Selection Policies

[1] Modality Worklist Information Model – FIND is only used for internal purposes and not provided as a user interface

Since FIND-SCU proposes a single presentation context only, the SCP is responsible for the transfer syntax selection.

4.2.5.3.1.3.4 Response Status

FIND-SCU will behave as described in the Table below when receiving the C-FIND response command message.

Table 4.2-35

RESPONSE STATUS HANDLING BEHAVIOR FOR AE FIND-SCU AND REAL-WORLD ACTIVITY 'LOCAL USER REQUESTS SENDING A QUERY'

Service Status	Further Meaning	Error Code	Behavior
Refused	Out of resources	A700	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
Failed	Data set does not match SOP class	A900	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
	Unable to process	Cxxx	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
Cancel	Matching terminated due to Cancel request	FE00	A warning message is output to the service logs. No message is posted to the user interface. Should never occur since Cancel requests are never issued.
Success	Matching is complete – No final identifier is supplied	0000	Current query is completed successfully; resulting list of studies is presented to the user.
Pending	Matches are continuing – Current match is supplied and any optional keys were supported in the same manner as required keys	FF00	Current match is added to the internal list of studies but not yet presented to the user.
	Matches are continuing – Warning that one or more optional keys were not supported for existence and/or matching for this identifier.	FF01	Current match is added to the internal list of studies but not yet presented to the user. A warning message is output to the service logs. No message is posted to the user interface.

Table 4.2-36

COMMUNICATION FAILURE BEHAVIOR FOR AE FIND-SCU AND REAL-WORLD ACTIVITY 'LOCAL USER REQUESTS SENDING A QUERY'

Exception	Behavior

TCP/IP connection could not be established within the specified time range (configurable parameter).	An error message is reported to both the service logs and to the user interface.
ASCE response message could not be received within the specified time range (configurable parameter).	An error message is reported to both the service logs and to the user interface.
DIMSE response message could not be received within the specified time range (configurable parameter).	An error message is reported to both the service logs and to the user interface.
Association aborted by the SCP using A-ABORT or the network layers indicate communication loss (i. e. low-level TCP/IP socket closure)	An error message is reported to both the service logs and to the user interface.

4.2.5.4 Association Acceptance Policy

FIND-SCU does not accept associations.

4.2.6 FIND-SCP

4.2.6.1 SOP Classes

FIND-SCP provides standard conformance to the following DICOM SOP classes.

Table 4.2-37

SOP CLASSES FOR AE FIND-SCP

SOP Class Name	SOP Class UID	SCU	SCP
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	No	Yes

4.2.6.2 Association Policies

4.2.6.2.1 General

FIND-SCP accepts but never initiates associations. The DICOM standard application context name, which is always proposed, is:

Table 4.2-38

DICOM APPLICATION CONTEXT

Application context name	1.2.840.10008.3.1.1.1

The PDU size is in the range 4096 to 131072 bytes. The default is 16384 bytes.

SOP Class extended negotiation is not supported.

4.2.6.2.2 Number of Associations

Table 4.2-39

NUMBER OF ASSOCIATIONS AS AN ASSOCIATION ACCEPTOR FIND-SCP

Maximum number of simultaneous associations	Dependent on system specifications

4.2.6.2.3 Asynchronous Nature

Asynchronous mode of operation is not supported.

4.2.6.2.4 Implementation Identifying Information

Table 4.2-40

DICOM IMPLEMENTATION CLASS AND VERSION FOR AE FIND-SCP

Implementation Class UID	1.3.6.1.4.1.53684.1.0.3.6.5
Implementation Version Name	CVI42_DCMTK_365

4.2.6.3 Association Initiation Policy

FIND-SCP does not initiate associations.

4.2.6.4 Association Acceptance Policy

FIND-SCP accepts any association for which at least one presentation context is accepted. Association requests may be rejected with the following status codes and reasons.

Table 4.2-41

ASSOCIATION REJECTION REASONS

Result	Source	Reason	Description
Rejected permanent	Provider, presentation related	Temporary congestion	Resource limitation: process creation failed
Rejected transient	User	Application context name not supported	Incorrect application context name

4.2.6.4.1 Activity – Remote AE sends a query request

4.2.6.4.1.1 Description and Sequencing of Activities

As query request is received from a remote AE, FIND-SCP will process the request and send a response to the remote system.

4.2.6.4.1.2 Accepted Presentation Contexts

Table 4.2-42

ACCEPTED PRESENTATION CONTEXTS FOR AE FIND-SCP

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
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, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None

4.2.6.4.1.2.1 Extended Negotiation

No extended negotiation is performed.

4.2.6.4.1.3 SOP Specific Conformance

4.2.6.4.1.3.1 SOP Specific Conformance to C-FIND SOP Classes

FIND-SCP provides standard conformance to the supported C-FIND SOP Class.

Table 4.2-43

STUDY ROOT REQUEST IDENTIFIER FOR AE FIND-SCP

Attribute Name	Tag	Types of Matching
Study Date	(0008,0020)	Universal, Single Value
Accession Number	(0008, 0050)	Universal, Wildcard
Modalities in Study	(0008,0061)	None
Study Description	(0008,1030)	Universal, Wildcard
Patient's Name	(0010,0010)	Universal, Wildcard
Patient's ID	(0010,0020)	Universal, Wildcard
Patient's Birth Date	(0010,0030)	Universal, Single Value
Patient's Sex	(0010,0040)	None
Study Instance UID	(0020,000D)	None

4.2.6.4.1.3.2 Response Status

FIND-SCP will behave as described in the Table below, when generating the C-FIND response message.

Table 4.2-44

RESPONSE STATUS HANDLING BEHAVIOR FOR AE FIND-SCP

Service Status	Further Meaning	Error Code	Behavior
Refused	Out of resources	A700	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
Failed	Data set does not match SOP class	A900	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
	Unable to process	Cxxx	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
Cancel	Matching terminated due to Cancel request	FE00	A warning message is output to the service logs. No message is posted to the user interface. Should never occur since Cancel requests are never issued.
Success	Matching is complete – No final identifier is supplied	0000	Current query is completed successfully; resulting list of studies is send in a response.

4.2.7 MOVE-SCU, GET-SCU

4.2.7.1 SOP Classes

MOVE-SCU, GET-SCU provides standard conformance to the following DICOM SOP classes.

Table 4.2-45

SOP CLASSES FOR AE MOVE-SCU

SOP Class Name	SOP Class UID	SCU	SCP
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	No
Study Root Query/Retrieve Information Model – GET	1.2.840.10008.5.1.4.1.2.2.3	Yes	No

4.2.7.2 Association Policies

4.2.7.2.1 General

MOVE-SCU, GET-SCU initiates but never accepts associations. The DICOM standard application context name, which is always proposed, is:

Table 4.2-46

DICOM APPLICATION CONTEXT

Application context name	1.2.840.10008.3.1.1.1

The PDU size is in the range 4096 to 131072 bytes. The default is 16384 bytes.

SOP Class extended negotiation is not supported.

4.2.7.2.2 Number of Associations

Table 4.2-47

NUMBER OF ASSOCIATIONS AS AN ASSOCIATION INITIATOR FOR AE MOVE-SCU

Maximum number of simultaneous associations	1

4.2.7.2.3 Asynchronous Nature

Asynchronous mode of operation is not supported.

4.2.7.2.4 Implementation Identifying Information

Table 4.2-48

DICOM IMPLEMENTATION CLASS AND VERSION FOR AE MOVE-SCU

Implementation Class UID	1.3.6.1.4.1.53684.1.0.3.6.5
Implementation Version Name	CVI42_DCMTK_365

4.2.7.3 Association Initiation Policy

MOVE-SCU, GET-SCU attempts to initiate a new association each time the user requests retrieval of particular studies. Each study is retrieved using a separate association, i. e. if the user selects multiple studies multiple successive associations are initiated.

4.2.7.3.1 Activity – Local user requests sending a query

4.2.7.3.1.1 Description and Sequencing of Activities

A single attempt will be made to retrieve a study from the remote AE. If the retrieval fails, no retry will be performed but an error message will be reported to the user.

4.2.7.3.1.2 Proposed Presentation Contexts

Table 4.2-49

PROPOSED PRESENTATION CONTEXTS FOR AE MOVE-SCU, GET-SCU AND REAL-WORLD ACTIVITY 'LOCAL USER REQUESTS RETRIEVAL OF PARTICULAR STUDIES'

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
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, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None
Study Root Query/Retrieve Information Model – GET	1.2.840.10008.5.1.4.1.2.2.3	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None

By default, MOVE-SCU, GET-SCU will propose all uncompressed transfer syntaxes with local byte ordering first.

4.2.7.3.1.2.1 Extended Negotiation

No extended negotiation is performed.

4.2.7.3.1.3 SOP Specific Conformance

4.2.7.3.1.3.1 SOP Specific Conformance to C-MOVE, C-GET SOP Classes

MOVE-SCU provides standard conformance to the supported C-MOVE SOP Class.
GET-SCU provides standard conformance to the supported C-GET SOP Class.

Only a single information model, Study Root, is supported. All retrieval is performed at the highest level of the information model (the STUDY level). No C-CANCEL requests are ever issued.

The retrieval is performed from the same AE that was used for the query performed by FIND-SCU. The studies are retrieved to the local system by specifying the destination as the AE Title of the local STORAGE-SCP. This implies that the remote AE must be preconfigured to determine the

presentation address corresponding to the STORAGE-SCP. The STORAGE-SCP will accept storage requests addressed to it from anywhere, so no pre-configuration of the local AE to accept associations from the remote AE is necessary.

Table 4.2-50

STUDY ROOT REQUEST IDENTIFIER FOR AE MOVE-SCU

Attribute Name	Tag	Request Key
Study Instance UID	(0020,000D)	Single Study Instance UID

4.2.7.3.1.3.2 Presentation Context Acceptance Criterion

MOVE-SCU, GET-SCU does not accept associations.

4.2.7.3.1.3.3 Transfer Syntax Selection Policies

Since MOVE-SCU proposes a single presentation context only, the SCP is responsible for the transfer syntax selection.

4.2.7.3.1.3.4 Response Status

MOVE-SCU will behave as described in the Table below when receiving the C-MOVE response command message.

Table 4.2-51

RESPONSE STATUS HANDLING BEHAVIOR FOR AE MOVE-SCU AND
REAL-WORLD ACTIVITY 'LOCAL USER REQUESTS RETRIEVAL OF PARTICULAR STUDIES'

Service Status	Further Meaning	Error Code	Behavior
Refused	Out of resources – Unable to calculate number of matches	A700	Retrieval is terminated. An error message is reported to both the service logs and to the user interface.
	Out of resources – Unable to perform sub-operations	A701	Retrieval is terminated. An error message is reported to both the service logs and to the user interface.
	Move destination unknown	A801	Retrieval is terminated. An error message is reported to both the service logs and to the user interface.
Failed	Data set does not match SOP class	A900	Retrieval is terminated. An error message is reported to both the service logs and to the user interface.
	Unable to process	Cxxx	Retrieval is terminated. An error message is reported to both the service logs and to the user interface.
Cancel	Sub-operations terminated due to Cancel indication	FE00	A warning message is output to the service logs. No message is posted to the user interface. Should never occur since Cancel requests are never issued.
Warning	Sub-operations complete – One or more failures	B000	Retrieval is considered successful.

			A warning message is output to the service logs. No message is posted to the user interface.
Success	Sub-operations complete – No failures	0000	Current retrieval is completed successfully
Pending	Sub-operations are continuing	FF00	Retrieval continues

Table 4.2-52
COMMUNICATION FAILURE BEHAVIOR FOR AE MOVE-SCU AND
REAL-WORLD ACTIVITY 'LOCAL USER REQUESTS RETRIEVAL OF PARTICULAR STUDIES'

Exception	Behavior
TCP/IP connection could not be established within the specified time range (configurable parameter).	An error message is reported to both the service logs and to the user interface.
ASCE response message could not be received within the specified time range (configurable parameter).	An error message is reported to both the service logs and to the user interface.
DIMSE response message could not be received within the specified time range (configurable parameter).	An error message is reported to both the service logs and to the user interface.
Association aborted by the SCP using A-ABORT or the network layers indicate communication loss (i. e. low-level TCP/IP socket closure)	An error message is reported to both the service logs and to the user interface.

4.2.7.3.1.3.5 Sub-operation dependent behavior

Since the C-MOVE operation is dependent on completion of C-STORE sub-operations that are occurring on a separate association, the question of failure of operations on the other association(s) must be considered.

MOVE-SCU completely ignores whatever activities are taking place in relation to the STORAGE-SCP AE that is receiving the retrieved instances. Once the C-MOVE has been initiated, it runs to completion (or failure) as described in the C-MOVE response command message(s). There is no attempt by MOVE-SCU to confirm that instances have actually been successfully received or locally stored.

Whether or not completely or partially successfully retrievals are made available in the local system to the user is purely dependent on the success or failure of the C-STORE sub-operations, not on any explicit action by MOVE-SCU.

Whether or not the remote AE attempts to retry any failed C-STORE sub-operations is beyond the control of MOVE-SCU.

If the association on which the C-MOVE was issued is aborted for any reason, whether or not the C-STORE sub-operations continue is dependent on the remote AE; the local STORAGE-SCP will continue to accept associations and storage operations regardless.

4.2.7.4 Association Acceptance Policy

MOVE-SCU does not accept associations.

4.2.8 MOVE-SCP

4.2.8.1 SOP Classes

MOVE-SCP provides standard conformance to the following DICOM SOP classes.

Table 4.2-53

SOP CLASSES FOR AE MOVE-SCP

SOP Class Name	SOP Class UID	SCU	SCP
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	No

4.2.8.2 Association Policies

4.2.8.2.1 General

MOVE-SCP accepts but never initiates associations. The DICOM standard application context name, which is always proposed, is:

Table 4.2-54

DICOM APPLICATION CONTEXT

Application context name	1.2.840.10008.3.1.1.1

The PDU size is in the range 4096 to 131072 bytes. The default is 16384 bytes.

SOP Class extended negotiation is not supported.

4.2.8.2.2 Number of Associations

Table 4.2-55

NUMBER OF ASSOCIATIONS AS AN ASSOCIATION INITIATOR FOR AE MOVE-SCP

Maximum number of simultaneous associations	Dependent on system specifications

4.2.8.2.3 Asynchronous Nature

Asynchronous mode of operation is not supported.

4.2.8.2.4 Implementation Identifying Information

Table 4.2-56

DICOM IMPLEMENTATION CLASS AND VERSION FOR AE MOVE-SCP

Implementation Class UID	1.3.6.1.4.1.53684.1.0.3.6.5
Implementation Version Name	CVI42_DCMTK_365

4.2.8.3 Association Initiation Policy

MOVE-SCP does not initiate associations.

4.2.8.4 Association Acceptance Policy

MOVE-SCP accepts any association for which at least one presentation context is accepted. Association requests may be rejected with the following status codes and reasons.

Table 4.2-57

ASSOCIATION REJECTION REASONS

Result	Source	Reason	Description
Rejected permanent	Provider, presentation related	Temporary congestion	Resource limitation: process creation failed
Rejected transient	User	Application context name not supported	Incorrect application context name

4.2.8.4.1 Activity – Remote AE sends instance(s)

4.2.8.4.1.1 Description and Sequencing of Activities

As move or get request is received from a remote AE, MOVE-SCP, GET-SCP will process the request and send a response to the remote system.

4.2.8.4.1.2 Accepted Presentation Contexts

Table 4.2-58

ACCEPTED PRESENTATION CONTEXTS FOR AE FIND-SCP

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
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, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCP	None
Study Root Query/Retrieve Information Model – GET	1.2.840.10008.5.1.4.1.2.2.3	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCP	None

4.2.8.4.1.2.1 Extended Negotiation

No extended negotiation is performed.

4.2.8.4.1.3 SOP Specific Conformance

4.2.8.4.1.3.1 SOP Specific Conformance to C-MOVE SOP Classes

MOVE-SCP provides standard conformance to the supported C-MOVE SOP Class.

Table 4.2-59

STUDY ROOT REQUEST IDENTIFIER FOR AE MOVE-SCP, GET-SCP

Attribute Name	Tag	Types of Matching
Study Date	(0008,0020)	Universal, Single Value
Accession Number	(0008, 0050)	Universal, Wildcard
Modalities in Study	(0008,0061)	None
Study Description	(0008,1030)	Universal, Wildcard
Patient's Name	(0010,0010)	Universal, Wildcard
Patient's ID	(0010,0020)	Universal, Wildcard
Patient's Birth Date	(0010,0030)	Universal, Single Value
Patient's Sex	(0010,0040)	None
Study Instance UID	(0020,000D)	None

4.2.8.4.1.3.2 Response Status

MOVE-SCP will behave as described in the Table below, when generating the C-FIND response message.

Table 4.2-60

RESPONSE STATUS HANDLING BEHAVIOR FOR AE MOVE-SCP

Service Status	Further Meaning	Error Code	Behavior
Refused	Out of resources	A700	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
Failed	Data set does not match SOP class	A900	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
	Unable to process	Cxxx	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
Cancel	Matching terminated due to Cancel request	FE00	A warning message is output to the service logs. No message is posted to the user interface. Should never occur since Cancel requests are never issued.
Success	Matching is complete – No final identifier is supplied	0000	Current query is completed successfully; resulting list of studies is send in a response.

4.2.9 MPPS-SCU

4.2.9.1 SOP Classes

MPPS-SCU provides standard conformance to the following DICOM SOP classes.

Table 4.2- 61

SOP CLASSES FOR AE MPPS-SCU

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

4.2.9.2 Association Policies

4.2.9.2.1 General

MPPS-SCU initiates but never accepts associations. The DICOM standard application context name, which is always proposed, is:

Table 4.2- 62

DICOM APPLICATION CONTEXT

Application context name	1.2.840.10008.3.1.1.1

The PDU size is in the range 4096 to 131072 bytes. The default is 16384 bytes.

SOP Class extended negotiation is not supported.

4.2.9.2.2 Number of Associations

Table 4.2- 63

NUMBER OF ASSOCIATIONS AS AN ASSOCIATION INITIATOR FOR AE MPPS-SCU

Maximum number of simultaneous associations	1

4.2.9.2.3 Asynchronous Nature

Asynchronous mode of operation is not supported.

4.2.9.2.4 Implementation Identifying Information

Table 4.2- 64

DICOM IMPLEMENTATION CLASS AND VERSION FOR AE MPPS-SCU

Implementation Class UID	1.3.6.1.4.1.53684.1.0.3.6.5
Implementation Version Name	CVI42_DCMTK_365

4.2.9.3 Association Initiation Policy

MPPS-SCU attempts to initiate a new association each time the user performs a procedure step.

4.2.9.3.1 Activity – Local user requests sending performed procedure steps

4.2.9.3.1.1 Description and Sequencing of Activities

When the user initially loads a study, a single attempt will be made to query the MWL-SCP using FIND-SCU. If the returned value is sufficient to notify the corresponding MPPS-SCP, MPPS-SCU sends an N-CREATE-RQ with status “IN PROGRESS” and waits for an N-CREATE-RSP. If MWL-SCP failed to respond or responded with insufficient data, MPPS-SCU is not invoked.
When the user finishes all post processing procedure steps by closing the current study, MPPS-SCU sends an N-SET-RQ with status “COMPLETED” to the remote host.

4.2.9.3.1.2 Proposed Presentation Contexts

Table 4.2- 65

PROPOSED PRESENTATION CONTEXTS FOR AE MPPS-SCU AND REAL-WORLD ACTIVITY 'LOCAL USER REQUESTS SENDING PERFORMED PROCEDURE STEPS'

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian, Explicit VR Little Endian, Explicit VR Big Endian	1.2.840.10008.1.2, 1.2.840.10008.1.2.1, 1.2.840.10008.1.2.2	SCU	None

By default, MPPS-SCU will propose all uncompressed transfer syntaxes with local byte ordering first.

4.2.9.3.1.2.1 Extended Negotiation

No extended negotiation is performed.

4.2.9.3.1.3 SOP Specific Conformance

4.2.9.3.1.3.1 SOP Specific Conformance to Modality Performed Procedure Step SOP Classes

MPPS-SCU provides standard conformance to the supported Modality Performed Procedure Step SOP Class

4.2.9.3.1.3.2 Presentation Context Acceptance Criterion

MPPS-SCU does not accept associations.

4.2.9.3.1.3.3 Transfer Syntax Selection Policies

Since MPPS-SCU proposes a single presentation context only, the SCP is responsible for the transfer syntax selection.

4.2.9.3.1.3.4 Response Status

MPPS-SCU will behave as described in the Table below when receiving the N-CREATE or N-SET response command message.

Table 4.2- 66

RESPONSE STATUS HANDLING BEHAVIOR FOR AE MPPS-SCU AND REAL-WORLD ACTIVITY 'LOCAL USER REQUESTS SENDING PERFORMED PROCEDURE STEPS'

Service Status	**Further Meaning**	**Error Code**	**Behavior**
Refused	Syntax error	01	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
Error	Input message errors	2x	This is treated as a permanent failure.

			An error message is reported to both the service logs and to the user interface.
	SCP return errors	3x 4x	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
	Network errors	6x	This is treated as a permanent failure. An error message is reported to both the service logs and to the user interface.
Success		00	N-CREATE or N-SET request has been sent successfully; result is reported to the service log

4.2.9.4 Association Acceptance Policy

MPPS-SCU does not accept associations.

4.3 Physical Network interfaces

4.3.1 Physical Network Interface

The DICOM applications of **cvi42** are indifferent to the physical medium over which TCP/IP is used.

4.3.2 Additional Protocols

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

4.3.3 IPv4 and IPv6 Support

cvi42 only supports IPv4 connections.

4.4 Configuration

The configuration can be changed by the user in the preferences dialog. Details are described in the user manual.

4.4.1 AE Title / Presentation Address Mapping

The Calling AE Title of the local AEs is configurable in the preferences dialog. The mapping of the logical name by which remote AEs are described in the user interface to Called AE Titles as well as presentation address (hostname or IP address and port number) is configurable in the preferences dialog.

4.4.1.1 Local AE Titles

Table 4.4-1

AE TITLE CONFIGURATION TABLE

Application Entity	Default AE Title	Default TCP/IP Port

STORAGE-SCP	CVI42	2000
STORAGE-SCU	CVI42	–
STORAGE COMMITMENT-SCP	CVI42	2000
STORAGE COMMITMENT-SCU	CVI42	-
FIND-SCP	CVI42	2000
FIND-SCU	CVI42	–
MOVE-SCP	CVI42	2000
MOVE-SCU	CVI42	–
GET-SCU	CVI42	–
MPPS-SCU	CVI42	-

4.4.1.2 Remote AE Titles

The AE Title, host name or IP address and port number of remote AEs are configured in the preferences dialog.

4.4.2 Configurable Parameters

Concerning the STORAGE-SCP application entity, the following parameters are configurable at installation time. For additional parameters, see the user manual.

Table 4.4-2

CONFIGURABLE PARAMETERS FOR AE STORAGE-SCP

Parameter	Configurable	Default Value
Run background process with STORAGE-SCP	Yes	Enabled
Time-out for ACSE messages	Yes	60 seconds
Time-out for DIMSE messages	Yes	60 seconds
Maximum PDU size the AE can receive	No	16384
Maximum number of simultaneous associations	No	Dependent on system specifications

Concerning the STORAGE-SCU application entity, the following parameters are configurable at installation time.

Table 4.4-3

CONFIGURABLE PARAMETERS FOR AE STORAGE-SCU

Parameter	Configurable	Default Value
Time-out waiting for response to TCP/IP connect request	Yes	60 seconds
Time-out for ACSE messages	Yes	60 seconds
Time-out for DIMSE messages	Yes	60 seconds
Maximum number of instances sent in one association	No	20
Maximum PDU size the AE can receive	Yes	16384

Maximum PDU size the AE actually sends	Yes	As negotiated
Proposed network transfer syntaxes	Yes	See 4.2.2.3.1.2
Proposed networking SOP Classes	Yes	See 4.2.2.3.1.2

Concerning the STORAGE COMMITMENT-SCP application entity, the following parameters are configurable at installation time.

Table 4.4-4

CONFIGURABLE PARAMETERS FOR AE STORAGE COMMITMENT-SCP

Parameter	Configurable	Default Value
Enable or disable STORAGE COMMITMENT-SCP	Yes	Enabled

Concerning the STORAGE COMMITMENT-SCU application entity, the following parameters are configurable at installation time.

Table 4.4-5

CONFIGURABLE PARAMETERS FOR AE STORAGE COMMITMENT-SCU

Parameter	Configurable	Default Value
Enable or disable STORAGE COMMITMENT-SCU	Yes	Disabled
Maximum number of retries	Yes	3
Delay between retries (seconds)	Yes	300
Time-out waiting for response to TCP/IP connect request	Yes	60 seconds
Time-out for ACSE messages	Yes	60 seconds
Time-out for DIMSE messages	Yes	60 seconds
Maximum PDU size the AE can receive	No	16384

Concerning the FIND-SCU application entity, the following parameters are configurable at installation time.

Table 4.4-6

CONFIGURABLE PARAMETERS FOR AE FIND-SCU

Parameter	Configurable	Default Value
Time-out waiting for response to TCP/IP connect request	Yes	60 seconds
Time-out for ACSE messages	Yes	60 seconds
Time-out for DIMSE messages	Yes	60 seconds
Maximum PDU size the AE can receive	Yes	16384
Proposed network transfer syntaxes	Yes	See 4.2.3.3.1.2

Concerning the MOVE-SCU application entity, the following parameters are configurable at installation time.

Table 4.4-7

CONFIGURABLE PARAMETERS FOR AE MOVE-SCU

Parameter	Configurable	Default Value
Time-out waiting for response to TCP/IP connect request	Yes	60 seconds
Time-out for ACSE messages	Yes	60 seconds
Time-out for DIMSE messages	Yes	60 seconds
Maximum PDU size the AE can receive	Yes	16384
Proposed network transfer syntaxes	Yes	See 4.2.4.3.1.2

Concerning the MPPS-SCU application entity, the following parameters are configurable at installation time.

Table 4.4-8

CONFIGURABLE PARAMETERS FOR AE MPPS-SCU

Parameter	Configurable	Default Value
Enable or disable MPPS-SCU	Yes	Disabled
Set default MPPS server	Yes	None
Set default MWL server	Yes	None
Time-out for ACSE messages	Yes	60 seconds
Time-out for DIMSE messages	Yes	60 seconds

5 MEDIA Storage

5.1 Implementation Model

5.1.1 Application Data Flow Diagram

Conceptually, the media storage service which is implemented in the **cvi42** system may be modeled as follows:

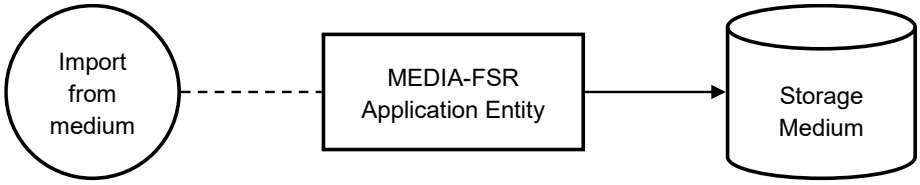

Figure 5-1. Application Data Flow Diagram

The MEDIA-FSR application entity reads DICOM images from a storage medium. The local real-world activity "Import from medium" is executed on user's request.

5.1.2 Functional Definition of AEs

5.1.2.1 Functional Definition of the MEDIA-FSR Application Entity

MEDIA-FSR is activated through the user interface to select a medium for import. All DICOM images that are referenced from the DICOMDIR on the storage medium are imported into the local database. In case the DICOMDIR file is missing, MEDIA-FSR scans all files on the storage medium and imports those DICOM images that are supported by the system.

5.1.3 Sequencing of Real-World Activities

All activities of the MEDIA-FSR application entity are sequentially initiated in the user interface, and another activity may not be initiated until the prior activity has completed.

5.1.4 File Meta Information for Implementation Class and Version

Not applicable.

5.2 AE Specifications

5.2.1 MEDIA-FSR

The MEDIA-FSR application entity provides standard conformance to the DICOM Interchange Option of the Media Storage Service Class. The application profiles and roles are the following.

Table 5.2-1

SUPPORTED APPLICATION PROFILES FOR AE MEDIA-FSR

Application Profiles Supported	Real-World Activity	Role	SC Option
STD-XABC-CD	Import from medium	FSR	Interchange
STD-XA1K-CD	Import from medium	FSR	Interchange
STD-XA1K-DVD	Import from medium	FSR	Interchange
STD-US-ID-SF-CD	Import from medium	FSR	Interchange
STD-US-ID-MF-CD	Import from medium	FSR	Interchange
STD-GEN-CD	Import from medium	FSR	Interchange
STD-CTMR-CD	Import from medium	FSR	Interchange
STD-CTMR-DVD	Import from medium	FSR	Interchange
STD-CTMR-DVD-RAM	Import from medium	FSR	Interchange

5.2.1.1 File Meta Information

Not applicable.

5.2.1.2 Real-World Activities

5.2.1.2.1 Activity – Import from medium

The MEDIA-FSR application entity acts as an FSR using the interchange option when requested to import SOP instances from a storage medium to the local system.

5.2.1.2.1.1 Media Storage Application Profiles

As listed in Table 5.2-1, MEDIA-FSR supports the STD-XABC-CD, STD-XA1K-CD, STD-XA1K-DVD, STD-US-ID-SF-CD, STD-US-ID-MF-CD, STD-GEN-CD, STD-CTMR-CD, STD-CTMR-DVD and STD-CTMR-DVD-RAM application profile for import.

5.2.1.2.1.2 Options

The MEDIA-FSR application entity supports the following SOP classes and transfer syntaxes.

Table 5.2-2

IODS, SOP CLASSES AND TRANSFER SYNTAXES FOR AE MEDIA-FSR

Information Object Definition	SOP Class UID	Transfer Syntax	Transfer Syntax UID
Media Storage Directory Storage	1.2.840.10008.1.3.10	Explicit VR Little Endian	1.2.840.10008.1.2.1
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Explicit VR Little Endian, JPEG Lossless (P14SV1)	1.2.840.10008.1.2.1, 1.2.840.10008.1.2.4.70
Digital X-Ray Image Storage For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1

Digital X-Ray Image Storage for Presentation	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Explicit VR Little Endian, JPEG Lossless (P14SV1)	1.2.840.10008.1.2.1, 1.2.840.10008.1.2.4.70
Multi-frame Single Bit SC Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
Multi-frame Grayscale Byte SC Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Explicit VR Little Endian	1.2.840.10008.1.2.1
Multi-frame Grayscale Word SC Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Explicit VR Little Endian	1.2.840.10008.1.2.1
Multi-frame True Color SC Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Explicit VR Little Endian	1.2.840.10008.1.2.1
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Explicit VR Little Endian	1.2.840.10008.1.2.1
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Explicit VR Little Endian	1.2.840.10008.1.2.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian, JPEG Lossless (P14SV1)	1.2.840.10008.1.2.1, 1.2.840.10008.1.2.4.70
Surface Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.5	Explicit VR Little Endian	1.2.840.10008.1.2.1
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian, RLE Lossless	1.2.840.10008.1.2.1, 1.2.840.10008.1.2.5
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian, RLE Lossless, JPEG Baseline (P1)	1.2.840.10008.1.2.1, 1.2.840.10008.1.2.5, 1.2.840.10008.1.2.4.50
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian, JPEG Baseline (P1), JPEG Extended (P2+4) JPEG Lossless (P14SV1)	1.2.840.10008.1.2.1, 1.2.840.10008.1.2.4.50, 1.2.840.10008.1.2.4.51, 1.2.840.10008.1.2.4.70
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	Explicit VR Little Endian	1.2.840.10008.1.2.1

5.3 Augmented and Private Application Profiles

The MEDIA-FSR application entity does not use any augmented or private application profiles.

5.4 Media Configuration

Concerning the MEDIA-FSR application entity, there are no configurable parameters.

6 Support of extended character sets

cvi42 does support extended character sets.

Table 8.1

Supported extended character sets

ISO_IR 100	Latin alphabet No. 1
ISO_IR 101	Latin alphabet No. 2
ISO_IR 109	Latin alphabet No. 3
ISO_IR 110	Latin alphabet No. 4
ISO_IR 144	Cyrillic
ISO_IR 127	Arabic
ISO_IR 126	Greek
ISO_IR 138	Hebrew
ISO_IR 148	Latin alphabet No. 5
ISO_IR 13	Japanese
ISO_IR 166	Thai
ISO 2022 IR 6	Default repertoire
ISO 2022 IR 100	Latin alphabet No. 1
ISO 2022 IR 101	Latin alphabet No. 2
ISO 2022 IR 109	Latin alphabet No. 3
ISO 2022 IR 110	Latin alphabet No. 4
ISO 2022 IR 144	Cyrillic
ISO 2022 IR 127	Arabic
ISO 2022 IR 126	Greek
ISO 2022 IR 138	Hebrew
ISO 2022 IR 148	Latin alphabet No. 5
ISO 2022 IR 13	Japanese
ISO 2022 IR 166	Thai
ISO 2022 IR 87	Japanese
ISO 2022 IR 159	Japanese
ISO 2022 IR 149	Korean
ISO_IR 192	Unicode in UTF-8
GB18030	GB18030

7 SECURITY

7.1 Security Profiles

7.1.1 TLS Secure Transport

Setting	Configurable	Default Value
DICOM TLS Port	Yes	2762

The DICOM TLS port can be configured in the “Network” tab in the cvi42 admin settings. The DICOM TLS implementation inherits the same key management strategy as the general TLS connection in the application. The application supports TLS on ingoing and outgoing connections.

The application uses the non-downgrading BCP 195 TLS Profile. It will only negotiate TLS 1.2 or newer and supports the following ciphers.

- TLS_DHE_RSA_WITH_AES_128_GCM_SHA256
- TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256
- TLS_DHE_RSA_WITH_AES_256_GCM_SHA384
- TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384

7.2 Association Level Security

The STORAGE-SCP accepts associations from all remote AEs in the default configuration, i. e. there is no restriction to certain AE titles and/or IP addresses. The STORAGE-SCP can be configured to accept only associations from known AEs.

7.3 Application Level Security

cvi42 does not support any application level security.

8 Annexes

8.1 IOD Contents

8.1.1 Created SOP Instances

8.1.1.1 Anonymization of SOP Instances

cvi42 supports the anonymization of instances (supported storage SOP classes only) and, thereby, derives a new, anonymized version from an existing instance. The anonymization is based on the Basic Application Level Confidentiality Profile defined in the DICOM standard, but **cvi42** does not claim conformance to these profiles (see section 7.1) since the original attribute values are not retained in an encrypted manner.

Table 8.1-1

MODIFIED FIELDS IN ANONYMIZED SOP INSTANCE

Attribute Name	Tag	Comment
Instance Creation Date	(0008,0012)	Replaced by an empty value if present
Instance Creation Time	(0008,0013)	Replaced by an empty value if present
Instance Creator UID	(0008,0014)	Replaced by an empty value if present
SOP Instance UID	(0008,0018)	Replaced by a new value
Accession Number	(0008,0050)	Replaced by an empty value if present
Institution Name	(0008,0080)	Replaced by an empty value if present
Institution Address	(0008,0081)	Replaced by an empty value if present
Referring Physician's Name	(0008,0090)	Replaced by an empty value if present
Referring Physician's Address	(0008,0092)	Replaced by an empty value if present
Referring Physician's Telephone Numbers	(0008,0094)	Replaced by an empty value if present
Station Name	(0008,1010)	Replaced by an empty value if present
Study Description	(0008,1030)	Replaced by an empty value if present
Series Description	(0008,103E)	Replaced by "Series Description"
Institutional Department Name	(0008,1040)	Replaced by an empty value if present
Physician(s) of Record	(0008,1048)	Replaced by an empty value if present

Performing Physicians' Name	(0008,1050)	Replaced by an empty value if present
Name of Physician(s) Reading Study	(0008,1060)	Replaced by an empty value if present
Operators' Name	(0008,1070)	Replaced by an empty value if present
Admitting Diagnoses Description	(0008,1080)	Replaced by an empty value if present
Derivation Description	(0008,2111)	Replaced by an empty value if present
Patient's Name	(0010,0010)	Replaced by a dummy value
Patient ID	(0010,0020)	Replaced by an empty value if present
Patient's Birth Date	(0010,0030)	Replaced by an empty value if present
Patient's Birth Time	(0010,0032)	Replaced by an empty value if present
Patient's Sex	(0010,0040)	Replaced by an empty value if present
Other Patient IDs	(0010,1000)	Replaced by an empty value if present
Other Patient Names	(0010,1001)	Replaced by an empty value if present
Patient's Age	(0010,1010)	Replaced by an empty value if present
Patient's Size	(0010,1020)	Replaced by an empty value if present
Patient's Weight	(0010,1030)	Replaced by an empty value if present
Ethnic Group	(0010,2160)	Replaced by an empty value if present
Occupation	(0010,2180)	Replaced by an empty value if present
Additional Patient History	(0010,21B0)	Replaced by an empty value if present
Patient Comments	(0010,4000)	Replaced by an empty value if present
Device Serial Number	(0018,1000)	Replaced by an empty value if present
Protocol Name	(0018,1030)	Replaced by an empty value if present
Study Instance UID	(0020,000D)	Replaced by a new value
Series Instance UID	(0020,000E)	Replaced by a new value

Study ID	(0020,0010)	Replaced by an empty value if present
Frame of Reference UID	(0020,0052)	Replaced by a new value
Image Comments	(0020,4000)	Replaced by an empty value if present
Request Attributes Sequence	(0040,0275)	Replaced by an empty sequence if present
Storage Media File Set UID	(0088,0140)	Replaced by an empty value if present
Additional Attributes		
Study Date	(0008,0020)	Replaced by an empty value if present
Series Date	(0008,0021)	Replaced by an empty value if present
Acquisition Date	(0008,0022)	Replaced by an empty value if present
Content Date	(0008,0023)	Replaced by "19700101"
Study Time	(0008,0030)	Replaced by an empty value if present
Series Time	(0008,0031)	Replaced by an empty value if present
Institution Code Sequence	(0008,0082)	Replaced by an empty value if present
Operator Identification Sequence	(0008,1072)	Replaced by an empty value if present
Physicians of Record Identification Sequence	(0008,1049)	Replaced by an empty sequence if present
Performing Physician Identification Sequence	(0008,1052)	Replaced by an empty sequence if present
Physician(s) Reading Study Identification Sequence	(0008,1062)	Replaced by an empty sequence if present
Referring Physician Identification Sequence	(0008,0096)	Replaced by an empty sequence if present
Referenced Patient Sequence	(0008,1120)	Replaced by an empty sequence if present
Referenced SOP Instance UID	(0008,1155)	Replaced by a new value
Related Series Sequence	(0008,1250)	Replaced by a new value
Issuer of Patient ID	(0010,0021)	Replaced by an empty value if present
Type Of Patient ID	(0010,0022)	Replaced by an empty value if present
Issuer Of Patient ID Qualifiers Sequence	(0010,0024)	Replaced by an empty sequence if present

Patient Insurance Plan Code Sequence	(0010,0050)	Replaced by an empty sequence if present
Patient Primary Language Code Sequence	(0010,0101)	Replaced by an empty sequence if present
Patient Primary Language Modifier Code Sequence	(0010,0102)	Replaced by an empty sequence if present
Other Patient IDs Sequence	(0010,1002)	Replaced by an empty sequence if present
Patient Birth Name	(0010,1005)	Replaced by an empty value if present
Patient Mother Birth Name	(0010,1060)	Replaced by an empty value if present
Military Rank	(0010,1080)	Replaced by an empty value if present
Branch Of Service	(0010,1081)	Replaced by an empty value if present
Medical Record Locator	(0010,1090)	Replaced by an empty value if present
Medical Alerts	(0010,2000)	Replaced by an empty value if present
Allergies	(0010,2110)	Replaced by an empty value if present
Country Of Residence	(0010,2150)	Replaced by an empty value if present
Region Of Residence	(0010,2152)	Replaced by an empty value if present
Patient Telephone Numbers	(0010,2154)	Replaced by an empty value if present
Smoking Status	(0010,21A0)	Replaced by an empty value if present
Pregnancy Status	(0010,21C0)	Replaced by an empty value if present
Last Menstrual Date	(0010,21D0)	Replaced by an empty value if present
Patient Religious Preference	(0010,21F0)	Replaced by an empty value if present
Patient Species Description	(0010,2201)	Replaced by an empty value if present
Patient Species Code Sequence	(0010,2202)	Replaced by an empty sequence if present
Patient Sex Neutered	(0010,2203)	Replaced by an empty value if present
Patient Breed Description	(0010,2292)	Replaced by an empty value if present

Patient Breed Code Sequence	(0010,2293)	Replaced by an empty sequence if present
Breed Registration Sequence	(0010,2294)	Replaced by an empty sequence if present
Breed Registration Number	(0010,2295)	Replaced by an empty value if present
Breed Registry Code Sequence	(0010,2296)	Replaced by an empty sequence if present
Responsible Person	(0010,2297)	Replaced by an empty value if present
Responsible Person Role	(0010,2298)	Replaced by an empty value if present
Responsible Organization	(0010,2299)	Replaced by an empty value if present
Requesting Physician Identification Sequence	(0032,1031)	Replaced by an empty sequence if present
Requesting Physician	(0032,1032)	Replaced by an empty value if present
Requesting Service	(0032,1033)	Replaced by an empty value if present
Requesting Service Code Sequence	(0032,1034)	Replaced by an empty sequence if present
Requested Procedure Description	(0032,1060)	Replaced by an empty value if present
Requested Procedure Code Sequence	(0032,1064)	Replaced by an empty sequence if present
Requested Contrast Agent	(0032,1070)	Replaced by an empty value if present
Study Status ID	(0032,000A)	Replaced by an empty value if present
Study Priority ID	(0032,000C)	Replaced by an empty value if present
Study ID Issuer	(0032,0012)	Replaced by an empty value if present
Study Verified Date	(0032,0032)	Replaced by an empty value if present
Study Verified Time	(0032,0033)	Replaced by an empty value if present
Study Read Date	(0032,0034)	Replaced by an empty value if present
Study Read Time	(0032,0035)	Replaced by an empty value if present
Scheduled Study Start Date	(0032,1000)	Replaced by an empty value if present

Scheduled Study Start Time	(0032,1001)	Replaced by an empty value if present
Scheduled Study Stop Date	(0032,1010)	Replaced by an empty value if present
Scheduled Study Stop Time	(0032,1011)	Replaced by an empty value if present
Scheduled Study Location	(0032,1020)	Replaced by an empty value if present
Scheduled Study Location AE Title	(0032,1021)	Replaced by an empty value if present
Reason For Study	(0032,1030)	Replaced by an empty value if present
Study Arrival Date	(0032,1040)	Replaced by an empty value if present
Study Arrival Time	(0032,1041)	Replaced by an empty value if present
Study Completion Date	(0032,1050)	Replaced by an empty value if present
Study Completion Time	(0032,1051)	Replaced by an empty value if present
Study Component Status ID	(0032,1055)	Replaced by an empty value if present
Study Comments	(0032,4000)	Replaced by an empty value if present
Referenced Patient Alias Sequence	(0038,0004)	Replaced by an empty sequence if present
Visit Status ID	(0038,0008)	Replaced by an empty value if present
Admission ID	(0038,0010)	Replaced by an empty value if present
Issuer Of Admission ID Sequence	(0038,0014)	Replaced by an empty sequence if present
Route Of Admissions	(0038,0016)	Replaced by an empty value if present
Admitting Date	(0038,0020)	Replaced by an empty value if present
Admitting Time	(0038,0021)	Replaced by an empty value if present
Special Needs	(0038,0050)	Replaced by an empty value if present
Service Episode ID	(0038,0060)	Replaced by an empty value if present
Service Episode Description	(0038,0062)	Replaced by an empty value if present

Issuer Of Service Episode ID Sequence	(0038,0064)	Replaced by an empty sequence if present
Pertinent Documents Sequence	(0038,0100)	Replaced by an empty sequence if present
Current Patient Location	(0038,0300)	Replaced by an empty value if present
Patient Institution Residence	(0038,0400)	Replaced by an empty value if present
Patient State	(0038,0500)	Replaced by an empty value if present
Patient Clinical Trial Participation Sequence	(0038,0502)	Replaced by an empty sequence if present
Visit Comments	(0038,4000)	Replaced by an empty value if present
Issuer Of Admission ID	(0038,0011)	Replaced by an empty value if present
Scheduled Admission Date	(0038,001A)	Replaced by an empty value if present
Scheduled Admission Time	(0038,001B)	Replaced by an empty value if present
Scheduled Discharge Date	(0038,001C)	Replaced by an empty value if present
Scheduled Discharge Time	(0038,001D)	Replaced by an empty value if present
Scheduled Patient Institution Residence	(0038,001E)	Replaced by an empty value if present
Discharge Date	(0038,0030)	Replaced by an empty value if present
Discharge Time	(0038,0032)	Replaced by an empty value if present
Discharge Diagnosis Description	(0038,0040)	Replaced by an empty value if present
Discharge Diagnosis Code Sequence	(0038,0044)	Replaced by an empty sequence if present
Issuer Of Service Episode ID	(0038,0061)	Replaced by an empty value if present
Scheduled Station AE Title	(0040,0001)	Replaced by an empty value if present
Scheduled Procedure Step Start Date	(0040,0002)	Replaced by an empty value if present
Scheduled Procedure Step Start Time	(0040,0003)	Replaced by an empty value if present
Scheduled Procedure Step End Date	(0040,0004)	Replaced by an empty value if present

Scheduled Procedure Step End Time	(0040,0005)	Replaced by an empty value if present
Scheduled Performing Physician Name	(0040,0006)	Replaced by an empty value if present
Scheduled Procedure Step Description	(0040,0007)	Replaced by an empty value if present
Scheduled Protocol Code Sequence	(0040,0008)	Replaced by an empty value if present
Scheduled Procedure Step ID	(0040,0009)	Replaced by an empty value if present
Stage Code Sequence	(0040,000A)	Replaced by an empty sequence if present
Scheduled Performing Physician Identification Sequence	(0040,000B)	Replaced by an empty sequence if present
Scheduled Station Name	(0040,0010)	Replaced by an empty value if present
Scheduled Procedure Step Location	(0040,0011)	Replaced by an empty value if present
Pre Medication	(0040,0012)	Replaced by an empty value if present
Scheduled Procedure Step Status	(0040,0020)	Replaced by an empty value if present
Order Placer Identifier Sequence	(0040,0026)	Replaced by an empty sequence if present
Order Filler Identifier Sequence	(0040,0027)	Replaced by an empty sequence if present
Local Namespace Entity ID	(0040,0031)	Replaced by an empty value if present
Universal Entity ID	(0040,0032)	Replaced by an empty value if present
Universal Entity ID Type	(0040,0033)	Replaced by an empty value if present
Identifier Type Code	(0040,0035)	Replaced by an empty value if present
Assigning Facility Sequence	(0040,0036)	Replaced by an empty sequence if present
Assigning Jurisdiction Code Sequence	(0040,0039)	Replaced by an empty sequence if present
Assigning Agency Or Department Code Sequence	(0040,003A)	Replaced by an empty sequence if present
Scheduled Procedure Step Sequence	(0040,0100)	Replaced by an empty sequence if present
Referenced Non Image Composite SOP Instance Sequence	(0040,0220)	Replaced by an empty sequence if present

Performed Station AE Title	(0040,0241)	Replaced by an empty value if present
Performed Station Name	(0040,0242)	Replaced by an empty value if present
Performed Location	(0040,0243)	Replaced by an empty value if present
Performed Procedure Step Start Date	(0040,0244)	Replaced by an empty value if present
Performed Procedure Step Start Time	(0040,0245)	Replaced by an empty value if present
Performed Procedure Step End Date	(0040,0250)	Replaced by an empty value if present
Performed Procedure Step End Time	(0040,0251)	Replaced by an empty value if present
Performed Procedure Step Status	(0040,0252)	Replaced by an empty value if present
Performed Procedure Step ID	(0040,0253)	Replaced by an empty value if present
Performed Procedure Step Description	(0040,0254)	Replaced by an empty value if present
Performed Procedure Type Description	(0040,0255)	Replaced by an empty value if present
Performed Protocol Code Sequence	(0040,0260)	Replaced by an empty sequence if present
Performed Protocol Type	(0040,0261)	Replaced by an empty value if present
Scheduled Step Attributes Sequence	(0040,0270)	Replaced by an empty sequence if present
Request Attributes Sequence	(0040,0275)	Replaced by an empty sequence if present
Comments On The Performed Procedure Step	(0040,0280)	Replaced by an empty value if present
Performed Procedure Step Discontinuation Reason Code Sequence	(0040,0281)	Replaced by an empty sequence if present
Quantity Sequence	(0040,0293)	Replaced by an empty sequence if present
Quantity	(0040,0294)	Replaced by an empty value if present
Billing Item Sequence	(0040,0296)	Replaced by an empty sequence if present
Total Time Of Fluoroscopy	(0040,0300)	Replaced by an empty value if present
Total Number Of Exposures	(0040,0301)	Replaced by an empty value if present

Entrance Dose	(0040,0302)	Replaced by an empty value if present
Exposed Area	(0040,0303)	Replaced by an empty value if present
Distance Source To Entrance	(0040,0306)	Replaced by an empty value if present
Exposure Dose Sequence	(0040,030E)	Replaced by an empty value if present
Comments On Radiation Dose	(0040,0310)	Replaced by an empty value if present
X Ray Output	(0040,0312)	Replaced by an empty value if present
Half Value Layer	(0040,0314)	Replaced by an empty value if present
Organ Dose	(0040,0316)	Replaced by an empty value if present
Organ Exposed	(0040,0318)	Replaced by an empty value if present
Billing Procedure Step Sequence	(0040,0320)	Replaced by an empty sequence if present
Film Consumption Sequence	(0040,0321)	Replaced by an empty sequence if present
Billing Supplies And Devices Sequence	(0040,0324)	Replaced by an empty sequence if present
Performed Series Sequence	(0040,0340)	Replaced by an empty sequence if present
Comments On The Scheduled Procedure Step	(0040,0400)	Replaced by an empty value if present
Protocol Context Sequence	(0040,0440)	Replaced by an empty sequence if present
Content Item Modifier Sequence	(0040,0441)	Replaced by an empty sequence if present
Scheduled Specimen Sequence	(0040,0500)	Replaced by an empty sequence if present
Container Identifier	(0040,0512)	Replaced by an empty value if present
Issuer Of The Container Identifier Sequence	(0040,0513)	Replaced by an empty sequence if present
Alternate Container Identifier Sequence	(0040,0515)	Replaced by an empty sequence if present
Container Type Code Sequence	(0040,0518)	Replaced by an empty sequence if present
Container Description	(0040,051A)	Replaced by an empty value if present

Container Component Sequence	(0040,0520)	Replaced by an empty sequence if present
Specimen Identifier	(0040,0551)	Replaced by an empty value if present
Specimen UID	(0040,0554)	Replaced by an empty value if present
Acquisition Context Sequence	(0040,0555)	Replaced by an empty sequence if present
Acquisition Context Description	(0040,0556)	Replaced by an empty value if present
Specimen Description Sequence	(0040,0560)	Replaced by an empty sequence if present
Issuer Of The Specimen Identifier Sequence	(0040,0562)	Replaced by an empty sequence if present
Specimen Type Code Sequence	(0040,059A)	Replaced by an empty sequence if present
Specimen Short Description	(0040,0600)	Replaced by an empty value if present
Specimen Detailed Description	(0040,0602)	Replaced by an empty value if present
Specimen Preparation Sequence	(0040,0610)	Replaced by an empty sequence if present
Specimen Preparation Step Content Item Sequence	(0040,0612)	Replaced by an empty sequence if present
Specimen Localization Content Item Sequence	(0040,0620)	Replaced by an empty sequence if present
Requested Procedure ID	(0040,1001)	Replaced by an empty value if present
Reason For The Requested Procedure	(0040,1002)	Replaced by an empty value if present
Requested Procedure Priority	(0040,1003)	Replaced by an empty value if present
Patient Transport Arrangements	(0040,1004)	Replaced by an empty value if present
Requested Procedure Location	(0040,1005)	Replaced by an empty value if present
Confidentiality Code	(0040,1008)	Replaced by an empty value if present
Reporting Priority	(0040,1009)	Replaced by an empty value if present
Reason For Requested Procedure Code Sequence	(0040,100A)	Replaced by an empty sequence if present
Names Of Intended Recipients Of Results	(0040,1010)	Replaced by an empty value if present

Intended Recipients Of Results Identification Sequence	(0040,1011)	Replaced by an empty value if present
Reason For Performed Procedure Code Sequence	(0040,1012)	Replaced by an empty sequence if present
Person Identification Code Sequence	(0040,1101)	Replaced by an empty sequence if present
Person Address	(0040,1102)	Replaced by an empty value if present
Person Telephone Numbers	(0040,1103)	Replaced by an empty value if present
Requested Procedure Comments	(0040,1400)	Replaced by an empty value if present
Issue Date Of Imaging Service Request	(0040,2004)	Replaced by an empty value if present
Issue Time Of Imaging Service Request	(0040,2005)	Replaced by an empty value if present
Order Entered By	(0040,2008)	Replaced by an empty value if present
Order Enterer Location	(0040,2009)	Replaced by an empty value if present
Order Callback Phone Number	(0040,2010)	Replaced by an empty value if present
Placer Order Number Imaging Service Request	(0040,2016)	Replaced by an empty value if present
Filler Order Number Imaging Service Request	(0040,2017)	Replaced by an empty value if present
Imaging Service Request Comments	(0040,2400)	Replaced by an empty value if present
Confidentiality Constraint On Patient Data Description	(0040,3001)	Replaced by an empty value if present
General Purpose Scheduled Procedure Step Status	(0040,4001)	Replaced by an empty value if present
General Purpose Performed Procedure Step Status	(0040,4002)	Replaced by an empty value if present
General Purpose Scheduled Procedure Step Priority	(0040,4003)	Replaced by an empty value if present
Scheduled Processing Applications Code Sequence	(0040,4004)	Replaced by an empty sequence if present
Scheduled Procedure Step Start Date Time	(0040,4005)	Replaced by an empty value if present
Multiple Copies Flag	(0040,4006)	Replaced by an empty value if present
Performed Processing Applications Code Sequence	(0040,4007)	Replaced by an empty sequence if present

Human Performer Code Sequence	(0040,4009)	Replaced by an empty sequence if present
Scheduled Procedure Step Modification Date Time	(0040,4010)	Replaced by an empty value if present
Expected Completion Date Time	(0040,4011)	Replaced by an empty value if present
Resulting General Purpose Performed Procedure Steps Sequence	(0040,4015)	Replaced by an empty sequence if present
Referenced General Purpose Scheduled Procedure Step Sequence	(0040,4016)	Replaced by an empty sequence if present
Scheduled Workitem Code Sequence	(0040,4018)	Replaced by an empty sequence if present
Performed Workitem Code Sequence	(0040,4019)	Replaced by an empty sequence if present
Input Availability Flag	(0040,4020)	Replaced by an empty value if present
Input Information Sequence	(0040,4021)	Replaced by an empty sequence if present
Relevant Information Sequence	(0040,4022)	Replaced by an empty sequence if present
Referenced General Purpose Scheduled Procedure Step Transaction UID	(0040,4023)	Replaced by an empty value if present
Scheduled Station Name Code Sequence	(0040,4025)	Replaced by an empty sequence if present
Scheduled Station Class Code Sequence	(0040,4026)	Replaced by an empty sequence if present
Scheduled Station Geographic Location Code Sequence	(0040,4027)	Replaced by an empty sequence if present
Performed Station Name Code Sequence	(0040,4028)	Replaced by an empty sequence if present
Performed Station Class Code Sequence	(0040,4029)	Replaced by an empty sequence if present
Performed Station Geographic Location Code Sequence	(0040,4030)	Replaced by an empty sequence if present
Requested Subsequent Workitem Code Sequence	(0040,4031)	Replaced by an empty sequence if present
Non DICOM Output Code Sequence	(0040,4032)	Replaced by an empty sequence if present
Output Information Sequence	(0040,4033)	Replaced by an empty sequence if present
Scheduled Human Performers Sequence	(0040,4034)	Replaced by an empty sequence if present
Actual Human Performers Sequence	(0040,4035)	Replaced by an empty sequence if present

Human Performer Organization	(0040,4036)	Replaced by an empty value if present
Human Performer Name	(0040,4037)	Replaced by an empty value if present
Raw Data Handling	(0040,4040)	Replaced by an empty value if present
Entrance Dose In mGy	(0040,8302)	Replaced by an empty value if present
Verifying Organization	(0040,A027)	Replaced by an empty value if present
Verification Date Time	(0040,A030)	Replaced by an empty value if present
Observation Date Time	(0040,A032)	Replaced by an empty value if present
Value Type	(0040,A040)	Replaced by an empty value if present
Concept Name Code Sequence	(0040,A043)	Replaced by an empty sequence if present
Continuity Of Content	(0040,A050)	Replaced by an empty value if present
Verifying Observer Sequence	(0040,A073)	Replaced by an empty sequence if present
Verifying Observer Name	(0040,A075)	Replaced by an empty value if present
Author Observer Sequence	(0040,A078)	Replaced by an empty sequence if present
Participant Sequence	(0040,A07A)	Replaced by an empty sequence if present
Custodial Organization Sequence	(0040,A07C)	Replaced by an empty sequence if present
Participation Type	(0040,A080)	Replaced by an empty value if present
Participation Date Time	(0040,A082)	Replaced by an empty value if present
Observer Type	(0040,A084)	Replaced by an empty value if present
Verifying Observer Identification Code Sequence	(0040,A088)	Replaced by an empty sequence if present
Referenced Waveform Channels	(0040,A0B0)	Replaced by an empty value if present
Date Time	(0040,A120)	Replaced by an empty value if present
Date	(0040,A121)	Replaced by an empty value if present

Time	(0040,A122)	Replaced by an empty value if present
Person Name	(0040,A123)	Replaced by an empty value if present
UID	(0040,A124)	Replaced by an empty value if present
Concept Code Sequence	(0040,A168)	Replaced by an empty sequence if present
Purpose Of Reference Code Sequence	(0040,A170)	Replaced by an empty sequence if present
Annotation Group Number	(0040,A180)	Replaced by an empty value if present
Modifier Code Sequence	(0040,A195)	Replaced by an empty sequence if present
Measured Value Sequence	(0040,A300)	Replaced by an empty sequence if present
Numeric Value Qualifier Code Sequence	(0040,A301)	Replaced by an empty sequence if present
Numeric Value	(0040,A30A)	Replaced by an empty value if present
Predecessor Documents Sequence	(0040,A360)	Replaced by an empty sequence if present
Referenced Request Sequence	(0040,A370)	Replaced by an empty sequence if present
Performed Procedure Code Sequence	(0040,A372)	Replaced by an empty sequence if present
Current Requested Procedure Evidence Sequence	(0040,A375)	Replaced by an empty sequence if present
Pertinent Other Evidence Sequence	(0040,A385)	Replaced by an empty sequence if present
HL7 Structured Document Reference Sequence	(0040,A390)	Replaced by an empty sequence if present
Completion Flag	(0040,A491)	Replaced by an empty value if present
Completion Flag Description	(0040,A492)	Replaced by an empty value if present
Verification Flag	(0040,A493)	Replaced by an empty value if present
Archive Requested	(0040,A494)	Replaced by an empty value if present
Preliminary Flag	(0040,A496)	Replaced by an empty value if present
Content Template Sequence	(0040,A504)	Replaced by an empty sequence if present

Identical Documents Sequence	(0040,A525)	Replaced by an empty sequence if present
Content Sequence	(0040,A730)	Replaced by an empty sequence if present
Waveform Annotation Sequence	(0040,B020)	Replaced by an empty sequence if present
Template Identifier	(0040,DB00)	Replaced by an empty value if present
Referenced Content Item Identifier	(0040,DB73)	Replaced by an empty value if present
HL7 Instance Identifier	(0040,E001)	Replaced by an empty value if present
HL7 Document Effective Time	(0040,E004)	Replaced by an empty value if present
HL7 Document Type Code Sequence	(0040,E006)	Replaced by an empty sequence if present
Retrieve URI	(0040,E010)	Replaced by an empty value if present
Retrieve Location UID	(0040,E011)	Replaced by an empty value if present

The various UIDs are replaced in a way that the original hierarchy of Study, Series and Instance is preserved. Also the new Frame of Reference UID is assigned in a consistent manner.

Private data elements can be removed completely from the anonymized instance if the system is configured accordingly.

For all Secondary Capture SOP classes, the instances are only anonymized if the element value of Burned in Annotation (0028,0301) is “NO”. If the element is missing or the value if “YES”, the instance is skipped and a warning message is reported to the user.
The processing of some attribute values during instance anonymization can be disabled if the system is configured accordingly. In this case, a warning message containing all skipped instance attributes is reported to the user.

Table 8.1-2

OPTIONALLY MODIFIED FIELDS IN ANONYMIZED SOP INSTANCE

Attribute Name	**Tag**
Institution Name	(0008,0080)
Institution Address	(0008,0081)
Study Description	(0008,1030)
Series Description	(0008,103E)
Patient’s Birth Date	(0010,0030)
Patient’s Sex	(0010,0040)
Patient’s Age	(0010,1010)
Patient’s Size	(0010,1020)

Patient's Weight	(0010,1030)
Ethnic Group	(0010,2160)
Protocol Name	(0018,1030)
Study Date	(0008,0020)
Series Date	(0008,0021)
Acquisition Date	(0008,0022)
Study Time	(0008,0030)
Series Time	(0008,0031)

8.1.1.2 Multi-frame Grayscale Byte SC Image IOD

cvi42 creates Multi-frame Grayscale Byte SC Image IOD objects containing the results of a quantitative evaluation in text format. The following tables describe the modules and attributes of the underlying IOD. Most attributes that are never present in a created SOP instance are omitted from the tables in order to increase the readability.

Table 8.1-3

MULTI-FRAME GRAYSCALE BYTE SC IMAGE IOD MODULES

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8.1-10	Always
	Clinical Trial Subject	–	Never
Study	General Study	Table 8.1-7	Always
	Patient Study	Table 8.1-54	Not always
	Clinical Trial Study	–	Never
Series	General Series	Table 8.1-8	Always
	Clinical Trial Series	–	Never
Equipment	General Equipment	Table 8.1-9	Always
	SC Equipment	Table 8.1-10	Always
Frame of Reference	Frame of Reference	–	Never
	Synchronization	–	Never
Image	General Image	Table 8.1-11	Always
	Image Pixel	Table 8.1-20	Always
	Image Plane[2] *(selected attributes only)*	Table 8.1-13	Not always
	Cine	–	Never
	Multi-frame	Table 8.1-12	Always
	Frame Pointers	–	Never
	Device	–	Never
	Specimen	–	Never
	Multi-frame Functional Groups	Table 8.1-14	Not Always

[2] According to the DICOM standard, this module is not required for this IOD (also see Section 8.5).

Multi-frame Dimension	–	Never
SC Image	–	Never
SC Multi-frame Image	Table 8.1-21	Always
SC Multi-frame Vector	–	Never
VOI LUT	Table 8.1-23	Not Always
SOP Common	Table 8.1-22	Always
Frame Extraction	–	Never

8.1.1.3 Multi-frame Grayscale Word SC Image IOD

cvi42 creates Multi-frame Grayscale Word SC Image objects showing the results of a quantitative evaluation in a graphical presentation (e. g. polar map, diagram). The following tables describe the modules and attributes of the underlying IOD. Most attributes that are never present in a created SOP instance are omitted from the tables in order to increase the readability.

Table 8.1-3

MULTI-FRAME GRAYSCALE WORD SC IMAGE IOD MODULES

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8.1-10	Always
	Clinical Trial Subject	–	Never
Study	General Study	Table 8.1-7	Always
	Patient Study	Table 8.1-54	Not Always
	Clinical Trial Study	–	Never
Series	General Series	Table 8.1-8	Always
	Clinical Trial Series	–	Never
Equipment	General Equipment	Table 8.1-9	Always
	SC Equipment	Table 8.1-10	Always
Frame of Reference	Frame of Reference	–	Never
	Synchronization	–	Never
Image	General Image	Table 8.1-11	Always
	Image Pixel	Table 8.1-24	Always
	Image Plane[3] *(selected attributes only)*	Table 8.1-13	Not always
	Cine	–	Never
	Multi-frame	Table 8.1-12	Always
	Frame Pointers	–	Never
	Device	–	Never
	Specimen	–	Never
	Multi-frame Functional Groups	Table 8.1-14	Not Always
	Multi-frame Dimension	–	Never

[3] According to the DICOM standard, this module is not required for this IOD (also see Section 8.5).

SC Image	–	Never
SC Multi-frame Image	Table 8.1-25	Always
SC Multi-frame Vector	–	Never
VOI LUT	Table 8.1-27	Not Always
SOP Common	Table 8.1-26	Always
Frame Extraction	–	Never

8.1.1.4 Multi-frame True Color SC Image IOD

cvi42 creates Multi-frame True Color SC Image objects containing parts of the original images with additional drawings (e. g. contours, overlays). The system also creates Multi-frame True Color SC Image objects with a proprietary stream of a **cvi42** workspace file, stored in private attributes. In this case, the pixel data contains textual information on the creation date and a user defined description.

The following tables describe the modules and attributes of the underlying IOD. Most attributes that are never present in a created SOP instance are omitted from the tables in order to increase the readability.

Table 8.1-5

MULTI-FRAME TRUE COLOR SC IMAGE IOD MODULES

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8.1-10	Always
	Clinical Trial Subject	–	Never
Study	General Study	Table 8.1-7	Always
	Patient Study	Table 8.1-54	Not Always
	Clinical Trial Study	–	Never
Series	General Series	Table 8.1-8	Always
	Clinical Trial Series	–	Never
Equipment	General Equipment	Table 8.1-9	Always
	SC Equipment	Table 8.1-10	Always
Frame of Reference	Frame of Reference	–	Never
	Synchronization	–	Never
Image	General Image	Table 8.1-11	Always
	Image Pixel	Table 8.1-26	Always
	Image Plane[4] *(selected attributes only)*	Table 8.1-13	Not always
	Cine	–	Never
	Multi-frame	Table 8.1-12	Always
	Frame Pointers	–	Never
	Device	–	Never
	Specimen	–	Never

[4] According to the DICOM standard, this module is not required for this IOD (also see Section 8.5).

	Multi-frame Functional Groups	Table 8.1-14	Not Always
	Multi-frame Dimension	–	Never
	SC Image	–	Never
	SC Multi-frame Image	Table 8.1-29	Always
	SC Multi-frame Vector	–	Never
	SOP Common	Table 8.1-30	Always
	Frame Extraction	–	Never
	Private Data	Table 8.1-31	Only for workspace objects

8.1.1.5 CT Image IOD/MR Image IOD

cvi42 creates CT or MR Image objects that are generated from volume datasets by means of Multiplanar Reconstruction (MPR). The following tables describe the modules and attributes of the underlying IOD. Most attributes that are never present in a created SOP instance are omitted from the tables in order to increase the readability.

Table 8.1-5

CT IMAGE/MR IMAGE IOD MODULES

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8.1-30	Always
	Clinical Trial Subject	–	Never
Study	General Study	Table 8.1-31	Always
	Patient Study	Table 8.1-54	Not Always
	Clinical Trial Study	–	Never
Series	General Series	Table 8.1-32	Always
	Clinical Trial Series	–	Never
Frame of Reference	Frame of Reference	Table 8.1-33	Always
Equipment	General Equipment	Table 8.1-34	Always
Image	General Image	Table 8.1-35	Always
	General Reference	Table 8.1-44	Always
	Image Pixel	Table 8.1-36	Always
	Image Plane	Table 8.1-37	Always
	Contrast/Bolus	–	Never
	Device	–	Never
	Specimen	–	Never
	CT Image/MR Image	Table 8.1-38/39	Always
	Overlay Plane	–	Never
	VOI LUT	–	Never
	SOP Common	Table 8.1-40	Always

8.1.1.6 Encapsulated PDF IOD

Cvi42 creates Encapsulated PDF objects containing a PDF copy of a generated report. The following tables describe the modules and attributes of the underlying IOD. Most attributes that are never present in a created SOP instance are omitted from the tables in order to increase the readability.

Table 8.1-4

ENCAPSULATED PDF IOD MODULES

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8.1-17	Always
	Clinical Trial Subject	–	Never
Study	General Study	Table 8.1-18	Always
	Patient Study	–	Never
	Clinical Trial Study	–	Never
Series	Encapsulated Document Series	Table 8.1-19	Always
	Clinical Trial Series	–	Never
Equipment	General Equipment	Table 8.1-20	Always
	SC Equipment	Table 8.1-21	Always
Encapsulated Document	Encapsulated Document	Table 8.1-22	Always
	SOP Common	Table 8.1-23	Always

8.1.1.7 Surface Segmentation IOD

Cvi42 creates Surface Segmentation objects from user generated structures. The following tables describe the modules and attributes of the underlying IOD. Most attributes that are never present in a created SOP instance are omitted from the tables to increase the readability.

Table 8.1-5

SURFACE SEGMENTATION IOD MODULES

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8.1-24	Always
	Clinical Trial Subject	–	Never
Study	General Study	Table 8.1-25	Always
	Patient Study	–	Never
	Clinical Trial Study	–	Never
Series	General Series	Table 8.1-26	Always
	Segmentation Series	Table 8.1-27	Always
	Clinical Trial Series	–	Never
Frame of Reference	Frame of Reference	Table 8.1-28	Always
Equipment	General Equipment	Table 8.1-29	Always
	Enhanced General Equipment	Table 8.1-30	

Image	Surface Segmentation	Table 8.1-31	Always
	Surface Mesh	Table 8.1-32	Always
	Common Instance Reference	Table 8.1-33	Always
	SOP Common	Table 8.1-34	Always

8.1.1.8 Common Secondary Capture Image Modules

Table 8.1-6

PATIENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Patient's Name	(0010,0010)	PN	From original DICOM image	Always
Patient ID	(0010,0020)	LO	From original DICOM image	Always, might be empty
Issuer of Patient ID	(0010,0021)	LO	From original DICOM image	Always, might be empty
Type of Patient ID	(0010,0022)	CS	From original DICOM image	Always, might be empty
Patient's Birth Date	(0010,0030)	DA	From original DICOM image	Always, might be empty
Patient's Sex	(0010,0040)	CS	From original DICOM image	Always, might be empty
Other Patient IDs	(0010,1000)	LO	From original DICOM image	Always, might be empty

Table 8.1-7

GENERAL STUDY MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Study Date	(0008,0020)	DA	From original DICOM image	Always, might be empty
Study Time	(0008,0030)	TM	From original DICOM image	Always, might be empty
Accession Number	(0008,0050)	SH	From original DICOM image	Always, might be empty
Referring Physician's Name	(0008,0090)	PN	From original DICOM image	Always, might be empty
Study Description	(0008,1030)	LO	From original DICOM image	Always, might be empty
Study Instance UID	(0020,000D)	UI	From original DICOM image	Always

Study ID	(0020,0010)	SH	From original DICOM image	Always, might be empty

Table 8.1-8

GENERAL SERIES MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Series Instance UID	(0020,000E)	UI	Generated automatically	Always
Series Number	(0020,0011)	IS	Generated automatically	Always
Laterality	(0020,0060)	CS		Empty
Patient Position	(0018,5100)	CS		Never
Series Description	(0008,103E)	LO	User Defined Description	Always
Modality	(0008,0060)	CS	See Table 8.1-10	

Table 8.1-9

GENERAL EQUIPMENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Manufacturer	(0008,0070)	LO	“CircleCVI”	Always
Manufacturer’s Model Name	(0008,1090)	LO	“cvi42”	Always
Institution Name	(0008,0080)	LO	From original DICOM image	Always, might be empty
Station Name	(0008,1010)	SH	From original DICOM image	Always, might be empty
Software Versions	(0018,1020)	LO	Current cvi42 version	Always

Table 8.1-10

SC EQUIPMENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Conversion Type	(0008,0064)	CS	“WSD”	Always
Modality	(0008,0060)	CS	From original DICOM image	Always
Secondary Capture Device Software Version	(0018,1018)	LO	Current cvi42 version	Always

Table 8.1-11

GENERAL IMAGE MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Image Type	(0008,0008)	CS		Never

Content Date	(0008,0023)	DA	Date of the content creation	Always
Content Time	(0008,0033)	TM	Time of the content creation	Always
Instance Number	(0020,0013)	IS	Sequential number increased for each instance within a series	Always
Patient Orientation	(0020,0020)	CS		Empty

Table 8.1-12
MULTI-FRAME MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Number of Frames	(0008,0008)	IS	Number of frames present in the Pixel Data attribute	Always
Frame Increment Pointer	(0028,0009)	AT	See Table 8.1-21	

Table 8.1-13
IMAGE PLANE MODULE OF CREATED SOP INSTANCES (SELECTED ATTRIBUTES)

Attribute Name	Tag	VR	Value	Presence of Value
Image Orientation (Patient)	(0020,0037)	DS		Always
Image Position (Patient)	(0020,0032)	DS		Always
Pixel Spacing	(0028,0030)	DS		Not Always

Table 8.1-14
MULTI-FRAME FUNCTIONAL GROUPS MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Content Date	(0008,0023)	DA	See Table 8.1-11	Always
Content Time	(0008,0033)	TM	See Table 8.1-11	Always
Instance Number	(0020,0013)	IS	See Table 8.1-11	Always
SOP Instance UID of Concatenation Source	(0020,0242)	UI		Never
Concatenation UID	(0020,9161)	UI		Never
In-concatenation Number	(0020,9162)	US		Never
In-concatenation Total Number	(0020,9163)	US		Never
Concatenation Frame Offset Number	(0020,9228)	UL		Never
Stereo Pairs Present	(0022,0028)	CS		Never
Number of Frames	(0028,0008)	IS	See Table 8.1-12	Always

Representative Frame Number	(0028,6010)	US		Never
Shared Functional Groups Sequence	(5200,9229)	SQ	One sequence item, see Table 8.1-15	Always
Per-frame Functional Groups Sequence	(5200,9230)	SQ	One sequence item per frame, see Table 8.1-15	Always

Table 8.1-15

SHARED/PER-FRAME FUNCTIONAL GROUPS SEQUENCE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Plane Position Sequence	(0020,9113)	SQ	One sequence item, see Table 8.1-17	Always
Plane Orientation Sequence	(0020,9116)	SQ	One sequence item, see Table 8.1-18	Always
Pixel Measures Sequence	(0028,9110)	SQ	One sequence item, see Table 8.1-19	Always

Table 8.1-17

PLANE POSITION SEQUENCE ITEM OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Image Position (Patient)	(0020,0032)	DS	Empty for Shared Functional Groups Sequence Item, Image Position for Per-Frame Functional Groups Sequence (if known)	Not Always

Table 8.1-18

PLANE ORIENTATION SEQUENCE ITEM OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Image Orientation (Patient)	(0020,0037)	DS	Empty for Shared Functional Groups Sequence Item, Image Orientation for Per-Frame Functional Groups Sequence (if known)	Not Always

Table 8.1-19

PIXEL MEASURES SEQUENCE ITEM OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Slice Thickness	(0018,0050)	DS	Empty for Shared Functional Groups	Not Always

			Sequence Item, Slice Thickness for Per-Frame Functional Groups Sequence (if known)	
Spacing Between Slices	(0018,0088)	DS	Empty for Shared Functional Groups Sequence Item, Spacing Between Slices for Per-Frame Functional Groups Sequence (if known)	Not Always
Pixel Spacing	(0028,0030)	DS		Not Always

Table 8.1-54

PATIENT STUDY MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Pregnancy Status	(0010,21C0)	US	From original DIOCM image	Not Always

8.1.1.9 Multi-frame Grayscale Byte SC Image Modules

Table 8.1-20

IMAGE PIXEL MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Samples Per Pixel	(0028,0002)	US	1	Always
Photometric Interpretation	(0028,0004)	CS	“MONOCHROME2”	Always
Planar Configuration	(0028,0006)	US		Never
Rows	(0028,0010)	US	Depends on the height of the image	Always
Columns	(0028,0011)	US	Depends on the width of the image	Always
Pixel Aspect Ratio	(0028,0034)	IS		Never
Bits Allocated	(0028,0100)	US	8	Always
Bits Stored	(0028,0101)	US	8	Always
High Bit	(0028,0102)	US	7	Always
Pixel Representation	(0028,0103)	US	0	Always
Pixel Data	(7FE0,0010)	OW	Depends on the content of the image	Always

Table 8.1-21

SC MULTI-FRAME IMAGE MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Frame Increment Pointer	(0028,0009)	AT		Never
Burned in Annotation	(0028,0301)	CS	“YES”	Always
Rescale Intercept	(0028,1052)	DS	0	Always
Rescale Slope	(0028,1053)	DS	1	Always
Rescale Type	(0028,1054)	LO	“US”	Always
Presentation LUT Shape	(2050,0020)	CS	“IDENTITY”	Always

Table 8.1-22

SOP COMMON MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Specific Character Set	(0008,0005)	CS	“ISO_IR 100” if original DICOM image is “ISO_IR 100” or empty, otherwise “ISO_IR 192”	Always
SOP Class UID	(0008,0016)	UI	“1.2.840.10008.5.1.4.1.1.7.2 “	Always
SOP Instance UID	(0008,0018)	UI	Generated automatically	Always
Contributing Equipment Sequence	(0018,A001)	SQ	From original DIOCM image	Always

Table 8.1-23

VOI LUT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Window Center	(0008,1050)	DS	127	Never in cvi42, Always in CoreCT
Window Width	(0008,1051)	DS	255	Never in cvi42, Always in CoreCT

8.1.1.10 Multi-frame Grayscale Word SC Image Modules

Table 8.1-24

IMAGE PIXEL MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Samples Per Pixel	(0028,0002)	US	1	Always

Photometric Interpretation	(0028,0004)	CS	“MONOCHROME2”	Always
Planar Configuration	(0028,0006)	US		Never
Rows	(0028,0010)	US	Depends on the height of the image	Always
Columns	(0028,0011)	US	Depends on the width of the image	Always
Pixel Aspect Ratio	(0028,0034)	IS		Never
Bits Allocated	(0028,0100)	US	16	Always
Bits Stored	(0028,0101)	US	16	Always
High Bit	(0028,0102)	US	15	Always
Pixel Representation	(0028,0103)	US	0	Always
Pixel Data	(7FE0,0010)	OW	Depends on the content of the image	Always

Table 8.1-25

SC MULTI-FRAME IMAGE MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Frame Increment Pointer	(0028,0009)	AT		Never
Burned in Annotation	(0028,0301)	CS	“YES”	Always
Rescale Intercept	(0028,1052)	DS	0	Always
Rescale Slope	(0028,1053)	DS	1	Always
Rescale Type	(0028,1054)	LO	“US”	Always
Presentation LUT Shape	(2050,0020)	CS	“IDENTITY”	Always

Table 8.1-26

SOP COMMON MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Specific Character Set	(0008,0005)	CS	“ISO_IR 100” if original DICOM image is “ISO_IR 100” or empty, otherwise “ISO_IR 192”	Always
SOP Class UID	(0008,0016)	UI	“1.2.840.10008.5.1.4.1.1.7.3 “	Always
SOP Instance UID	(0008,0018)	UI	Generated automatically	Always
Contributing Equipment Sequence	(0018,A001)	SQ	From original DIOCM image	Always

Table 8.1-27

VOI LUT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Window Center	(0008,1050)	DS	127	Never in cvi42, Always in CoreCT
Window Width	(0008,1051)	DS	255	Never in cvi42, Always in CoreCT

8.1.1.11 Multi-frame True Color SC Image Modules

Table 8.1-28

IMAGE PIXEL MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Samples Per Pixel	(0028,0002)	US	3	Always
Photometric Interpretation	(0028,0004)	CS	“RGB”	Always
Planar Configuration	(0028,0006)	US	0	Always
Rows	(0028,0010)	US	Depends on the height of the image	Always
Columns	(0028,0011)	US	Depends on the width of the image	Always
Pixel Aspect Ratio	(0028,0034)	IS		Never
Bits Allocated	(0028,0100)	US	8	Always
Bits Stored	(0028,0101)	US	8	Always
High Bit	(0028,0102)	US	7	Always
Pixel Representation	(0028,0103)	US	0	Always
Pixel Data	(7FE0,0010)	OW	Depends on the content of the image	Always

Table 8.1-29

SC MULTI-FRAME IMAGE MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Frame Increment Pointer	(0028,0009)	AT		Never
Pixel Spacing	(0028,0030)	DS	Calculated pixel spacing	Only if applicable
Burned in Annotation	(0028,0301)	CS	“YES”	Always

Table 8.1-30

SOP COMMON MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Specific Character Set	(0008,0005)	CS	“ISO_IR 100” if original DICOM image is “ISO_IR 100” or empty, otherwise “ISO_IR 192”	Always
SOP Class UID	(0008,0016)	UI	“1.2.840.10008.5.1.4.1.1.7.4“	Always
SOP Instance UID	(0008,0018)	UI	Generated automatically	Always
Contributing Equipment Sequence	(0018,A001)	SQ	From original DIOCM image	Always

Table 8.1-31

PRIVATE DATA MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Private Creator	(0025,0010)	LO	"CVI42 CIRCLECVI”	Always
Workspace ID	(0025,1010)	LO	User defined workspace identifier	Always
Workspace Time String	(0025,1020)	LO	Time stamp of workspace generation	Always
Workspace Stream	(0025,1030)	OB	Proprietary stream of a **cvi42** workspace file	Always

8.1.1.12 Encapsulated PDF Modules

Table 8.1-17

PATIENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Patient’s Name	(0010,0010)	PN	rom original DICOM image	Always
Patient ID	(0010,0020)	LO	rom original DICOM image	lways, might be empty
Issuer of Patient ID	(0010,0021)	LO	rom original DICOM image	Always, might be empty
Type of Patient ID	(0010,0022)	CS	rom original DICOM image	Always, might be empty
Patient’s Birth Date	(0010,0030)	DA	rom original DICOM image	Always, might be empty
Patient’s Sex	(0010,0040)	CS	rom original DICOM image	Always, might be empty
Other Patient IDs	(0010,1000)	LO	rom original DICOM image	Always, might be empty

Ethnic Group	(0010,2160)	SH	rom original DICOM image	Always, might be empty

Table 8.1-18
GENERAL STUDY MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Study Date	(0008,0020)	DA	rom original DICOM image	Always, might be empty
Study Time	(0008,0030)	TM	rom original DICOM image	Always, might be empty
Accession Number	(0008,0050)	SH	rom original DICOM image	Always, might be empty
Referring Physician's Name	(0008,0090)	PN	rom original DICOM image	Always, might be empty
Study Description	(0008,1030)	LO	rom original DICOM image	Always, might be empty
Study Instance UID	(0020,000D)	UI	rom original DICOM image	Always
Study ID	(0020,0010)	SH	rom original DICOM image	Always, might be empty

Table 8.1-19
ENCAPSULATED DOCUMENT SERIES MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Series Instance UID	(0020,000E)	UI	Generated automatically	Always
Series Number	(0020,0011)	IS	902	Always
Modality	(0008,0060)	CS	"DOC"	Always
Series Description	(0008,103E)	LO	"TruPlan Report"	Always

Table 8.1-20
GENERAL EQUIPMENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Manufacturer	(0008,0070)	LO	"Circle CVI"	Always
Institution Name	(0008,0080)	LO	From original DICOM image	Never
Station Name	(0008,1010)	SH	From original DICOM image	Never
Manufacturer's Model Name	(0008,1090)	LO	"TruPlan"	Always
Software Versions	(0018,1020)	LO	Current **TruPlan** version	Always
Device Serial Number	(00181,1000)	LO	Current **TruPlan** version	Always

Table 8.1-21

SC EQUIPMENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Conversion Type	(0008,0064)	CS	“WSD”	Always
Modality	(0008,0060)	CS	“DOC”	Always

Table 8.1-22

ENCAPSULATED DOCUMENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Content Date	(0008,0023)	DA	Date of the content creation	Always
Content Time	(0008,0033)	TM	Time of the content creation	Always
Instance Number	(0020,0013)	IS	1	Always
Burned In Annotation	(0028,0301)	CS	“YES”	Always
Document Title	(0042,0010)	ST	“TruPlan Report”	Always
Concept Name Code Sequence	(0040,A043)	SQ		Always, might be empty
MIME Type of Encapsulated Document	(0042,0012)	LO	“application/pdf”	Always

Table 8.1-23

SOP COMMON MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Specific Character Set	(0008,0005)	CS	"ISO_IR 100”	Always
SOP Class UID	(0008,0016)	UI	“1.2.840.10008.5.1.4.1.1.104.1“	Always
SOP Instance UID	(0008,0018)	UI	Generated automatically	Always

8.1.1.13 Surface Segmentation Modules

Table 8.1-24

PATIENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Patient’s Name	(0010,0010)	PN	rom original DICOM image	Always
Patient ID	(0010,0020)	LO	rom original DICOM image	lways, might be empty
Patient’s Birth Date	(0010,0030)	DA	rom original DICOM image	Always, might be empty
Patient’s Sex	(0010,0040)	CS	rom original DICOM image	Always, might be empty

Table 8.1-25

GENERAL STUDY MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Study Date	(0008,0020)	DA	rom original DICOM image	Always, might be empty
Study Time	(0008,0030)	TM	rom original DICOM image	Always, might be empty
Accession Number	(0008,0050)	SH	rom original DICOM image	Always, might be empty
Referring Physician's Name	(0008,0090)	PN	rom original DICOM image	Always, might be empty
Study Instance UID	(0020,000D)	UI	rom original DICOM image	Always
Study ID	(0020,0010)	SH	rom original DICOM image	Empty

Table 8.1-26

GENERAL SERIES MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Series Instance UID	(0020,000E)	UI	Generated automatically	Always
Series Number	(0020,0011)	IS	See Table 8.1-27	
Series Description	(0008,103E)	LO		Always
Modality	(0008,0060)	CS	See Table 8.1-27	

Table 8.1-27

SEGMENTATION SERIES MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Series Number	(0020,0011)	IS	"902"	Always
Modality	(0008,0060)	CS	"SEG"	Always

Table 8.1-28

FRAME OF REFERENCE MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Frame of Reference UID	(0020,0052)	UI	From original DICOM image	Always
Position Reference Indicator	(0020,1040)	LO	From original DICOM image	Always

Table 8.1-29

GENERAL EQUIPMENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Manufacturer	(0008,0070)	LO	“CircleCVI”	Always
Manufacturer’s Model Name	(0008,1090)	LO	"TruPlan”	Always
Software Versions	(0018,1020)	LO	Current **TruPlan** version	Always

Table 8.1-30

ENHANCED GENERAL EQUIPMENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Manufacturer	(0008,0070)	LO	“CircleCVI”	Always
Manufacturer’s Model Name	(0008,1090)	LO	"TruPlan”	Always
Device Serial Number	(0018,1000)	LO	Current **TruPlan** version	Always
Software Versions	(0018,1020)	LO	Current **TruPlan** version	Always

Table 8.1-31

SURFACE SEGMENTATION MODULE OF CREATED SOP INSTANCES

Attribute Name			Tag	VR	Value	Presence of Value
Content Date			(0008,0023)	DA	Date of the content creation	Always
Content Time			(0008,0033)	TM	Time of the content creation	Always
Instance Number			(0020,0013)	IS	1	Always
Content Label			(0070,0087)	CS	“TRUPLAN_SSO”	Always
Content Description			(0070,0081)	LO		Always
Content Creator’s Name			(0070,0084)	PN		Empty
Segment Sequence			(0062,0002)	SQ	Sequence of segment data	Always
	Segment Number		(0062,0004)	US		Always
	Segment Label		(0062,0005)	LO		Always
	Segment Algorithm Type		(0062,0008)	CS	“AUTOMATIC”	Always
	Segmented Property Category Code Sequence		(0062,0003)	SQ		Always
		Code Value	(0008,0100)	SH	“91723000”	Always
		Code Scheme Designator	(0008,0102)	SH	“SCT”	Always
		Code Meaning	(0008,0104)	LO	"Anatomical Structure"	Always
	Segmented Property Type Code Sequence		(0062,000F)	SQ		Always
		Code Value	(0008,0100)	SH	“122485”	Always
		Code Scheme Designator	(0008,0102)	SH	“DCM”	Always
		Code Meaning	(0008,0104)	LO	"Sphere"	Always
	Anatomic Region Sequence		(0008,2218)	SQ		Always
		Code Value	(0008,0100)	SH	“T-D0010”	Always
		Code Scheme Designator	(0008,0102)	SH	“SRT”	Always
		Code Meaning	(0008,0104)	LO	"Entire Body"	Always
	Surface Count		(0066,002A)	UL		Always
	Referenced Surface Sequence		(0066,002B)	SQ		Always
		Referenced Surface Number	(0066,002C)	UL		Always

		Segment Surface Generation Algorithm Identification Sequence			(0066,002D)	SQ		Always
			Algorithm version		(0066,0031)	LO	“1”	Always
			Algorithm Name		(0066,0036)	LO	“Manual Processing”	Always
			Algorithm Family Code Sequence					
				Code Value	(0008,0100)	SH	“123109”	Always
				Code Scheme Designator	(0008,0102)	SH	“DCM”	Always
				Code Meaning	(0008,0104)	LO	" Manual Processing "	Always
		Segment Surface Source Instance Sequence			(0066,002E)	SQ		Always
			Referenced SOP Class UID		(0008,1150)	UI	From original DICOM image	Always
			Referenced SOP Instance UID		(0008,1155)	UI	From original DICOM image	Always

Table 8.1-32

SURFACE MESH OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value

Number Of Surfaces			(0066,0001)	UL		Always
Surface Sequence			(0066,0002)	SQ		Always
	Surface Number		(0066,0003)	UL		Always
	Surface Processing		(0066,0009)	CS		Empty
	Recommended Display Grayscale Value		(0062,000C)	US		Always
	Recommended Display CIELab Value		(0062,000D)	US		Always
	Recommended Presentation Opacity		(0066,000C)	FL	.0	Always
	Recommended Presentation Type		(0066,000D)	CS	SURFACE”	Always
	Finite Volume		(0066,000E)	CS	UNKOWN”	Always
	Manifold		(0066,0010)	CS	UNKOWN”	Always
	Surface Comments		(0066,0004)	LT		Empty
	Surface Points Sequence		(0066,0011)	SQ		Always
		Number Of Surface Points	(0066,0015)	UL		Always
		Point Coordinates Data	(0066,0016)	OF		Always
	Surface Points Normals Sequence		(0066,0012)	SQ		Optional
		Number Of Vectors	(0066,001E)	UL		Optional
		Vector Dimensionality	(0066,001F)	US		Optional
		Vector Coordinate Data	(0066,0021)	OF		Optional
	Surface Mesh Primitives Sequence		(0066,0013)	SQ		Always

		Triangle Point Index List	(0066,0023)	OW		If number of indices ≤ 65535
		Edge Point Index List	(0066,0024)	OW		Empty
		Vertex Point Index List	(0066,0025)	OW		Empty
		Triangle Strip Sequence	(0066,0026)	SQ		Empty
		Triangle Fan Sequence	(0066,0027)	SQ		Empty
		Line Sequence	(0066,0028)	SQ		Empty
		Facet Sequence	(0066,0034)	SQ		Empty
		Long Triangle Point Index List	(0066,0041)	OL		Always
		Long Edge Point Index List	(0066,0042)	OL		Empty
		Long Vertex Point Index List	(0066,0043)	OL		Empty

Table 8.1-33

COMMON INSTANCE REFERENCE MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Referenced Series Sequence	(0008,1115)	SQ		Always

	Series Instance UID		(0020,000E)	UI	From original DICOM image	Always
	Referenced Instance Sequence		(0008,114A)	SQ		Always
		Referenced SOP Class UID	(0008,1150)	UI	From original DICOM image	Always
		Referenced SOP Instance UID	(0008,1155)	UI	From original DICOM image	Always

Table 8.1-34

SOP COMMON MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Specific Character Set	(0008,0005)	CS	"ISO_IR 192”	Always
SOP Class UID	(0008,0016)	UI	“1.2.840.10008.5.1.4.1.1.66.5“	Always
SOP Instance UID	(0008,0018)	UI	Generated automatically	Always

8.1.1.14 CT/MR Image Modules

Table 8.1-32

PATIENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Patient’s Name	(0010,0010)	PN	From original DICOM image	Always
Patient ID	(0010,0020)	LO	From original DICOM image	Always, might be empty
Patient’s Birth Date	(0010,0030)	DA	From original DICOM image	Always, might be empty
Patient’s Sex	(0010,0040)	CS	From original DICOM image	Always, might be empty

Table 8.1-33

GENERAL STUDY MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Study Date	(0008,0020)	DA	From original DICOM image	Always, might be empty

Study Time	(0008,0030)	TM	From original DICOM image	Always, might be empty
Accession Number	(0008,0050)	SH		Empty
Referring Physician's Name	(0008,0090)	PN		Empty
Study Description	(0008,1030)	LO	From original DICOM image	Always, might be empty
Study Instance UID	(0020,000D)	UI	From original DICOM image	Always
Study ID	(0020,0010)	SH		Empty

Table 8.1-34

GENERAL SERIES MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Series Instance UID	(0020,000E)	UI	Generated automatically	Always
Series Number	(0020,0011)	IS	Generated automatically	Always
Laterality	(0020,0060)	CS		Empty
Series Description	(0008,103E)	LO	cvi42: MR - Module specific description appended with "cvi42" CT - "cvi42 Derived Images" coreCT: Module or view specific description or series classification prepended to the original series description.	Always
Patient Position	(0018,5100)	CS	From original DICOM image	Always
Modality	(0008,0060)	CS	"CT" or "MR"	Always

Table 8.1-35

GENERAL EQUIPMENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Manufacturer	(0008,0070)	LO	CT - "CircleCVI" MR - "CircleCVI via original manufacturer"	Always
Manufacturer's Model Name	(0008,1090)	LO	"cvi42"	Always
Software Versions	(0018,1020)	LO	Current cvi42 version	Always

Table 8.1-36

FRAME OF REFERENCE MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Frame of Reference UID	(0020,0052)	UI	Generated automatically	Always
Position Reference Indicator	(0020,1040)	LO		Empty

Table 8.1-37

GENERAL IMAGE MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Image Type	(0008,0008)	CS	See Table 8.1-40/41	
Content Date	(0008,0023)	DA	Date of the content creation	Always
Content Time	(0008,0033)	TM	Time of the content creation	Always
Instance Number	(0020,0013)	IS	Sequential number increased for each instance within a series	Always
Image Comments	(0020,0040)	LT	MR – From original DICOM image or Module specific image comments CT – "cvi42 resliced Type: <...> Orientation: <...>" for resliced series generated on the server	Might be empty
Presentation LUT Shape	(2050,0020)	CS	"IDENTITY"	Always

Table 8.1-38

IMAGE PIXEL MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Samples Per Pixel	(0028,0002)	US	See Table 8.1-40/41	
Photometric Interpretation	(0028,0004)	CS	See Table 8.1-40/41	
Planar Configuration	(0028,0006)	US		Never
Rows	(0028,0010)	US	Depends on the height of the image	Always
Columns	(0028,0011)	US	Depends on the width of the image	Always
Pixel Aspect Ratio	(0028,0034)	IS		Never
Bits Allocated	(0028,0100)	US	See Table 8.1-40/41	
Bits Stored	(0028,0101)	US	See Table 8.1-40/41	

High Bit	(0028,0102)	US	See Table 8.1-40/41	
Pixel Representation	(0028,0103)	US	0	Always
Pixel Data	(7FE0,0010)	OW	Depends on the content of the image	Always
Red Palette Color Lookup Table Descriptor	(0028,1101)	US or SS	From original DICOM image. MR only	Not Always in cvi42, never in CoreCT
Green Palette Color Lookup Table Descriptor	(0028,1102)	US or SS	From original DICOM image. MR only	Not Always in cvi42, never in CoreCT
Blue Palette Color Lookup Table Descriptor	(0028,1103)	US or SS	From original DICOM image. MR only	Not Always in cvi42, never in CoreCT
Red Palette Color Lookup Table Data	(0028,1201)	OW	From original DICOM image. MR only	Not Always in cvi42, never in CoreCT
Green Palette Color Lookup Table Data	(0028,1202)	OW	From original DICOM image. MR only	Not Always in cvi42, never in CoreCT
Blue Palette Color Lookup Table Data	(0028,1203)	OW	From original DICOM image. MR only	Not Always in cvi42, never in CoreCT

Table 8.1-39

IMAGE PLANE MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Pixel Spacing	(0028,0030)	DS		Always
Image Orientation (Patient)	(0020,0037)	DS		Always
Image Position (Patient)	(0020,0032)	DS		Always
Slice Thickness	(0018,0050)	DS		Always
Slice Location	(0020,1041)	DS		Always

Table 8.1-40

CT IMAGE MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Image Type	(0008,0008)	CS	“DERIVED\SECONDARY\ AXIAL”	Always
Samples Per Pixel	(0028,0002)	US	1	Always
Photometric Interpretation	(0028,0004)	CS	“MONOCHROME2”	Always
Bits Allocated	(0028,0100)	US	16	Always
Bits Stored	(0028,0101)	US	16	Always
High Bit	(0028,0102)	US	15	Always
Rescale Intercept	(0028,1052)	DS		Always

Rescale Slope	(0028,1053)	DS	"1"	Always
Rescale Type	(0028,1054)	LO		Never
KVP	(0018,0060)	DS	From original DICOM image	Always, might be empty
Acquisition Number	(0020,0012)	IS	From original DICOM image	Always, might be empty

Table 8.1-41

MR IMAGE MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Image Type	(0008,0008)	CS	"DERIVED\SECONDARY\ OTHER"	Always
Samples Per Pixel	(0028,0002)	US	1	Always
Photometric Interpretation	(0028,0004)	CS	"MONOCHROME2"	Always
Bits Allocated	(0028,0100)	US	16	Always
Bits Stored	(0028,0101)	US	16	Always
High Bit	(0028,0102)	US	15	Always
Rescale Intercept	(0028,1052)	DS		Always
Rescale Slope	(0028,1053)	DS	"1"	Always
Rescale Type	(0028,1054)	LO		Never
Acquisition Number	(0020,0012)	IS	From original DICOM image	Always, might be empty

Table 8.1-42

SOP COMMON MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Specific Character Set	(0008,0005)	CS	"ISO_IR 100" if original DICOM image is "ISO_IR 100" or empty, otherwise "ISO_IR 192"	Always
SOP Class UID	(0008,0016)	UI	"1.2.840.10008.5.1.4.1.1.2"	Always
SOP Instance UID	(0008,0018)	UI	Generated automatically	Always
Contributing Equipment Sequence	(0018,A001)	SQ	From original DIOCM image	Always

Table 8.1-43

GENERAL REFERENCE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Referenced Image Sequence	(0008,1140)	SQ		Might be empty
> Referenced SOP Class UID	(0008,1150)	UI	Copied from the first slice of referenced DICOM volume	Always
> Referenced SOP Instance UID	(0008,1155)	UI	Copied from the first slice of referenced DICOM volume	Always
Source Image Sequence	(0008,2112)	SQ		Might be empty
> Referenced SOP Class UID	(0008,1150)	UI	From Referenced DICOM	Always
> Referenced SOP Instance UID	(0008,1155)	UI	From Referenced DICOM	Always

8.1.1.15 Storage Commitment IOD

Table 8.1-44

N-EVENT-REPORT ATTRIBUTES OF STORAGE COMMITMENT PUSH MODEL SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Instance Creation Date	(0008,0012)	DA	Date of content creation	Always
Instance Creation Time	(0008,0013)	TM	Time of content creation	Always
Transaction UID	(0008,1195)	UI	Generated automatically	Always
Failed SOP Sequence	(0008,1198)	SQ	List of storage commitment failed instances	Might be empty
Referenced SOP Sequence	(0008,1199)	SQ	List of storage commitment succeeded instances	Might be empty

8.1.1.16 Modality Performed Procedure Step IOD

Table 8.1-45

N-CREATE/N-SET ATTRIBUTES OF
MODALITY PERFORMED PROCEDURE STEP SOP INSTANCES

Attribute Name	Tag	N-CREATE		N-SET	
		Value	Presence of Value	Value	Presence of Value

Procedure Code Sequence	(0008,1032)		Empty		Empty
Referenced Patient Sequence	(0008,1120)		Always, might be empty		Never
Patient's Name	(0010,0010)	From image or MWL-SCP	Always, might be empty		Never
Patient ID	(0010,0020)	From image or MWL-SCP	Always, might be empty		Never
Patient's Birth Date	(0010,0030)	From image or MWL-SCP	Always, might be empty		Never
Patient's Sex	(0010,0040)	From image or MWL-SCP	Always, might be empty		Never
Study ID	(0020,0010)	From MWL-SCP	Always, might be empty		Never
Performed Station AE Title	(0040,0241)	Configuration	Always		Never
Performed Station Name	(0040,0242)	"cvi42"	Always, might be empty		Never
Performed Location	(0040,0243)		Empty		Never
Performed Procedure Step Start Date	(0040,0244)	Date of content creation	Always		Never
Performed Procedure Step Start Time	(0040,0245)	Time of content creation	Always		Never
Performed Procedure Step End Date	(0040,0250)	Date of content creation	Always, might be empty	Date of content creation	Always, might be empty
Performed Procedure Step End Time	(0040,0251)	Time of content creation	Always, might be empty	Time of content creation	Always, might be empty
Performed Procedure Step Status	(0040,0252)	"IN PROGRESS"	Always	"COMPLETED"	Always
Performed Procedure Step ID	(0040,0253)	From MWL-SCP	Always		Never
Performed Procedure Step Description	(0040,0254)	"Post-processing", "Report"	Always, might be empty	"Post-processing", "Report"	Always, might be empty

Performed Procedure Type Description	(0040,0255)		Empty		Empty
Performed Protocol Code Sequence	(0040,0260)		Empty		Empty
Scheduled Step Attributes Sequence	(0040,0270)	From MWL-SCP	Always		Never
>Accession Number	(0008,0050)	From image or MWL-SCP	Always, might be empty		Never
>Referenced Study Sequence	(0008,1110)		Always, might be empty		Never
>Study Instance UID	(0020,000D)	From image or MWL-SCP	Always		Never
>Requested Procedure Description	(0032,1060)	From MWL-SCP	Always, might be empty		Never
>Scheduled Procedure Step Description	(0040,0007)	From MWL-SCP	Always, might be empty		Never
>Scheduled Protocol Code Sequence	(0040,0008)	From MWL-SCP	Always, might be empty		Never
>Scheduled Procedure Step ID	(0040,0009)	From MWL-SCP	Always, might be empty		Never
>Requested Procedure ID	(0040,1001)	From MWL-SCP	Always, might be empty		Never
Performed Series Sequence	(0040,0340)		Always, might be empty		Always, might be empty
>Performing Physician Name	(0008,1050)		Empty		Empty
>Protocol Name	(0018,1030)	“Post-processing”, “Report”	Always	“Post-processing”, “Report”	Always
>Operator’s Name	(0008,1070)		Empty		Empty
>Series Instance UID	(0002,000E)	Generated automatically	Always	Generated automatically	Always
>Series Description	(0008,103E)		Empty		Empty
>Retrieve AE Title	(0008,0054)		Empty		Empty
>Referenced Image Sequence	(0008,1140)		Empty		Empty

>Referenced Non-Image Composite SOP Instance Sequence	(0040,0220)		Empty		Empty
Modality	(0080,0060)	From image or MWL-SCP	Always		Never

8.1.1.17 Basic Text SR IOD

cvi42 creates a Basic Text Structured Report from a generated report. The following tables describe the modules and attributes of the underlying IOD. Attributes that are never present in a created SOP instance are omitted from the tables to increase readability.

Table 8.1-46

BASIC TEXT SR IOD MODULES

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8.1-47	Always
	Clinical Trial Subject	–	Never
Study	General Study	Table 8.1-48	Always
	Patient Study	–	Never
	Clinical Trial Study	–	Never
Series	SR Document Series	Table 8.1-49	Always
	Clinical Trial Series	–	Never
Equipment	General Equipment	Table 8.1-50	Always
SR Document	SR Document General	Table 8.1-51	Always
	SR Document Content	Table 8.1-52	Alwflays
	SOP Common	Table 8.1-53	Always

Table 8.1-47

PATIENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Patient's Name	(0010,0010)	PN	From original DICOM image	Always
Patient ID	(0010,0020)	LO	From original DICOM image	lways, might be empty
Issuer of Patient ID	(0010,0021)	LO	From original DICOM image	Not Always
Patient's Birth Date	(0010,0030)	DA	From original DICOM image	Always, might be empty
Patient's Sex	(0010,0040)	CS	From original DICOM image	Always, might be empty

Table 8.1-48

GENERAL STUDY MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Study Date	(0008,0020)	DA	From original DICOM image	Always, might be empty
Study Time	(0008,0030)	TM	From original DICOM image	Always, might be empty
Accession Number	(0008,0050)	SH	From original DICOM image	Always, might be empty
Study Description	(0008,1030)	LO	From original DICOM image	Always, might be empty
Study Instance UID	(0020,000D)	UI	From original DICOM image	Always
Study ID	(0020,0010)	SH	From original DICOM image	Always, might be empty

Table 8.1-49

SR DOCUMENT SERIES MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Series Instance UID	(0020,000E)	UI	Generated automatically	Always
Series Number	(0020,0011)	IS	Starts in 1000	Always
Modality	(0008,0060)	CS	“SR”	Always
Series Description	(0008,103E)	LO	“cvi42 Report (<Report State>)” e.g. “cvi42 Report (Preliminary Report)”	Always
Series Date	(0008,0021)	DA	Date of series creation	Always
Series Time	(0008,0031)	TM	Time of series creation	Always

Table 8.1-50

GENERAL EQUIPMENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Manufacturer	(0008,0070)	LO	“Circle CVI”	Always
Manufacturer’s Model Name	(0008,1090)	LO	Current cvi42 version	Always

Table 8.1-51

SR DOCUMENT GENERAL MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Instance Number	(0020,0013)	IS	1	Always

Preliminary Flag	(0040,a496)	CS	“PRELIMINARY” or “FINAL”	Always
Completion Flag	(0040,A491)	CS	“PARTIAL” or “COMPLETE”	Always
Verification Flag	(0040,A493)	CS	“UNVERIFIED” or “VERIFIED”	Always
Content Date	(0008,0023)	DA	Date of the content creation	Always
Content Time	(0008,0033)	TM	Time of the content creation	Always
Verifying Observer Sequence	(0040,A073)	SQ		Not Always
> Verifying Observer Name	(0040,A075)	PN	Reporter Name	Not Always
> Verifying Observer Identification Code Sequence	(0040,A088)	SQ	-	Not Always, Empty
> Verifying Organization	(0040,A027)	LO	-	Not Always, Empty
> Verification DateTime	(0040,A030)	DT	Last Report State change Date and Time	Not Always

Table 8.1-52
SR DOCUMENT CONTENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Value Type	(0040,A040)	CS	One of "TEXT", "NUM", "CODE", "DATE", "TIME", "DATETIME", "PNAME", "CONTAINER"	Always
Concept Name Code Sequence	(0040,A043)	SQ		Always
Text Value	(0040,A160)	UT		Not Always
DateTime	(0040,A120)	DT		Not Always
Date	(0040,A121)	DA		Not Always
Time	(0040,A122)	TM		Not Always
Person Name	(0040,A123)	PN		Not Always
Measured Value Sequence	(0040,A300)	SQ		Not Always
> Numeric Value	(0040,A30A)	DS		Not Always
> Measurement Units Code Sequence	(0040,08EA)	SQ		Not Always
>> Code Value	(0008,0100)	SH		Not Always
>> Coding Scheme Designator	(0008,0102)	SH	“UCUM”	Not Always
>> Code Meaning	(0008,0104)	LO		Not Always
Concept Code Sequence	(0040,A168)	SQ		Not Always

> Code Value	(0008,0100)	SH		Not Always
> Coding Scheme Designator	(0008,0102)	SH	“UCUM”	Not Always
> Code Meaning	(0008,0104)	LO		Not Always
Continuity of Content	(0040,A050)	CS	“SEPARATE” or “CONTINUOUS”	Not Always
Content Sequence	(0040,A730)	SQ		Not Always
> Relationship Type	(0040,A010)	CS	One of "CONTAINS", "HAS OBS CONTEXT", "HAS ACQ CONTEXT", "HAS CONCEPT MOD", "HAS PROPERTIES", "INFERRED FROM", "SELECTED FROM"	Not Always

Table 8.1-53

SOP COMMON MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value
Specific Character Set	(0008,0005)	CS	"ISO_IR 192”	Always
SOP Class UID	(0008,0016)	UI	“1.2.840.10008.5.1.4.1.1.88.11”	Always
SOP Instance UID	(0008,0018)	UI	Generated automatically	Always

8.1.2 Usage of Attribute from Received IODs

The STORAGE-SCP application entity makes use of the following attributes from an incoming DICOM object.

Table 8.1-71

USED FIELDS IN RECEIVED IOD FOR AE STORAGE-SCP

Attribute Name	Tag	Comment
SOP Class UID	(0008,0016)	Used to determine whether SOP Class is supported by the application
SOP Instance UID	(0008,0018)	Used to derive local filename
Study Instance UID	(0020,000D)	Used for the local database
Series Instance UID	(0020,000E)	Used for the local database

All three attributes listed in Table 8.1-40 must be present in the received instances with non-empty values in order to be processed by the system.

8.1.3 Attribute Mapping

cvi42 does not use any attribute mapping.

8.1.4 Coerced / Modified Fields

cvi42 does not modify any fields.

The anonymization of existing SOP instances is described in section 8.1.1.1.

8.2 Data Dictionary of Private Attributes

The private attributes added to created SOP instances are listed in Table 8.2-1. **cvi42** reserves blocks of private attributes in group 0x0025. Further details on the usage of these private attributes are described in Section 8.1.

Table 8.2-1

DATA DICTIONARY OF PRIVATE ATTRIBUTES IN CREATED SOP INSTANCES

Tag	Attribute Name	VR	VM	Attribute Description
(0025,0010)	Private Creator	LO	1	Identification of the creator of the group of private data elements
(0025,1010)	Workspace ID	LO	1	User defined workspace identifier
(0025,1020)	Workspace Time String	LO	1	Time stamp of workspace generation
(0025,1030)	Workspace Stream	OB	1	Proprietary stream of a **cvi42** workspace file, containing information on display setting and contour definitions

The following private attributes are supported in received SOP Instances.

Table 8.2-2

DATA DICTIONARY OF PRIVATE ATTRIBUTES FOR GENERAL ELECTRICS DEVICES

Tag	Attribute Name	VR	VM
(0019,109C)	Pulse Sequence Name	LO	1
(0019,10CC)	Velocity Encoding	SS	1
(0019,10E2)	Velocity Encode Scale	DS	1
(0043,1030)	Vas Collapse Flag	SS	1
(0043,1032)	Raw Data Type	SS	1
(0043,102D)	Image Filter Mode	SH	1
(0043,10CA)	DL Recon Strength	LO	1

Table 8.2-3

DATA DICTIONARY OF PRIVATE ATTRIBUTES FOR PHILIPS DEVICES

Tag	Attribute Name	VR	VM
(2001,101A)	PC Velocity	FL	1-n
(2005,10A0)	Perfusion Time	FL	1
(2005,1409)	Original Rescale Intercept	DS	1
(2005,140A)	Original Rescale Slope	DS	1
(2005,140B)	Original Rescale Type	LO	1
(2005,1572)	Inversion Delay Time	FL	1

Table 8.2-4

DATA DICTIONARY OF PRIVATE ATTRIBUTES FOR SIEMENS DEVICES

Tag	Attribute Name	VR	VM
(0029,1010)	CSA Image Header Info	OB	1
(0029,1020)	CSA Series Header Info	OB	1
(0051,1016)	Image Type	LO	1
(0021,11FE)	Function Sequence	SQ	1
(0021,1129)	Velocity Description	SH	1

Table 8.2-5

DATA DICTIONARY OF PRIVATE ATTRIBUTES FOR CANON/TOSHIBA DEVICES

Tag	Attribute Name	VR	VM
(700D,1000)	Velocity Encoded Scale Factor	DS	1

Table 8.2-6

DATA DICTIONARY OF PRIVATE ATTRIBUTES FOR HITACHI DEVICES

Tag	Attribute Name	VR	VM
(0029,1016)	Target Velocity	LO	1
(0029,1017)	Velocity Encoded Axis	LO	1
(0029,1062)	Flow Encoded	CS	1

(0029,1075)	Flow Image Type	CS	1

Table 8.2-7
DATA DICTIONARY OF PRIVATE ATTRIBUTES FOR UIH DEVICES

Tag	Attribute Name	VR	VM
(0065,1012)	Velocity Direction	LO	1
(0065,102B)	Velocity Encoded	LT	1
(0065,1002)	Acquisition Orientation	LO	1
(0065,1005)	Phase Encoding Direction	SH	1
(0051,1014)	Velocity Rescale	SH	1

The Private Creator element is not checked for the supported private groups, but the value of the Manufacturer (0008,0070) data element. Please note that this behavior conforms to the specifications of the two device manufacturers.

8.3 Coded Terminology and Templates

cvi42 does not use any coded terminology or templates.

8.4 Grayscale Image Consistency

cvi42 does not make use of the DICOM Grayscale Standard Display Function.

8.5 Standard Extended / Specialized / Private SOP Classes

cvi42 uses a standard extended SOP class for the various Secondary Capture Images by adding selected attributes from the Image Plane Module. In addition, the system uses a private data module for the Multi-frame True Color SC Image IOD. See section 8.1.1 for details.

The system does not support any specialized or private SOP classes.

8.6 Private Transfer Syntaxes

cvi42 does not use any private transfer syntaxes.