



DCMimport 3.0

DICOM Conformance Statement

Import and reconciliation of external DICOM studies

Version 3.0.1 · September 2026

Sup-C · Belgium · sup-c.com · info@sup-c.com

Copyright © 2026 Patrick Cleys (Sup-C). All rights reserved.

Contents

1 Conformance Statement Overview.....	3
2 Introduction.....	4
2.1 Revision history.....	4
2.2 Audience and remarks.....	4
2.3 Terms and abbreviations.....	4
2.4 References.....	4
3 Networking.....	5
3.1 Implementation model.....	5
3.2 AE specification.....	5
3.3 Network interfaces.....	9
3.4 Configuration.....	9
4 Media interchange.....	11
5 Support of character sets.....	12
6 Security.....	13
Appendix A IODs created by DCMimport.....	14
Appendix B Attribute coercion (reconciliation).....	15

1 Conformance Statement Overview

DCMimport imports DICOM studies from media (CD, DVD, USB, folders) and from other DICOM systems, reconciles the patient and order data with the local modality worklist or PACS (IHE Import Reconciliation Workflow) and sends the reconciled studies to one or more DICOM storage servers.

DCMimport has one Application Entity. As SCU it verifies connections, queries the worklist and the PACS and sends images. As SCP (the built-in gateway) it receives images and answers verification requests.

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
Storage SOP Classes (all known to fo-dicom 5.2.6, see 3.2.1.2)	Yes	Yes
Query/Retrieve		
Patient Root Query/Retrieve Information Model – FIND	Option	No
Study Root Query/Retrieve Information Model – FIND	Yes (default)	No
Workflow Management		
Modality Worklist Information Model – FIND	Yes	No
Verification		
Verification	Yes	Yes

Patient Root and Study Root are alternatives: Setup → Dicom Query Connection chooses one. DCMimport does not support C-MOVE, C-GET, Storage Commitment, MPPS or any print or retrieve service.

DCMimport reads DICOM files from media (chapter 4) but does not create media and does not claim conformance to a Media Storage Application Profile.

2 Introduction

2.1 Revision history

Version	Date	Description
3.0.0	September 2026	First conformance statement, for DCMimport 3.0.

2.2 Audience and remarks

This document is written for the people who connect DCMimport to a PACS, a RIS or worklist broker and to other DICOM systems. It assumes a working knowledge of DICOM.

The conformance statement alone does not guarantee interoperability. Test the connection with every system involved (Echo in Setup, a worklist and PACS query, a send) before clinical use.

DCMimport is built on fo-dicom 5.2.6. Where this statement says that a value is the fo-dicom default, DCMimport does not change it.

2.3 Terms and abbreviations

Term	Meaning
AE	Application Entity
IRWF	IHE Import Reconciliation Workflow
MWL	Modality Worklist
PDU	Protocol Data Unit
SCP / SCU	Service Class Provider / User
Working copy	The copy of an imported file in the data folder of DCMimport. Reconciliation changes only working copies, never the original media.

2.4 References

- NEMA PS3, Digital Imaging and Communications in Medicine (DICOM), current edition.
- IHE Radiology Technical Framework, Import Reconciliation Workflow (IRWF).
- DCMimport 3.0 Installation and User Manual.

3 Networking

3.1 Implementation model

3.1.1 Application data flow

Local real-world activity	DCMimport AE	Remote real-world activity
Echo (Setup, server window)	C-ECHO SCU	Verification by the remote AE
Get Dicom Worklist	MWL C-FIND SCU	Worklist provided by a RIS or broker
Query PACS	Q/R C-FIND SCU	Query answered by the PACS
Store Selected Patient	C-STORE SCU	Images stored by the PACS or another archive
Images appear in the tree (gateway)	C-STORE SCP, C-ECHO SCP	A modality or another system sends images

3.1.2 Functional definition of the AE

- **Echo** sends a C-ECHO to the selected server and shows the result.
- **Get Dicom Worklist** sends one MWL C-FIND to the worklist connection with the request tags of Setup as return keys and their standard values as matching keys. The user selects one answer; its values fill the fields to reconcile.
- **Query PACS** sends one C-FIND at STUDY level (Study Root) or PATIENT level (Patient Root) to the query connection. Study Root answers are grouped per Patient ID and Issuer. The user selects a patient; only patient-level values are taken over.
- **Store Selected Patient** sends the checked images, reconciled or not, to all External Dicom Servers (or to one, chosen with the arrow). Several servers are served at the same time (Setup → External Dicom Servers → Servers at the same time, 1–8, default 2).
- **The gateway** listens on its port as long as DCMimport runs and the gateway is on (Setup → Dicom Server). Every image received is written to the data folder and added to the list in the tree, where it is handled like an imported image.

3.1.3 Sequencing of real-world activities

Reconciliation (Change Patient Data) is a local operation between a query and a send; it is described in Appendix B. Sending does not require a reconciliation first, and a query does not change any image by itself.

3.2 AE specification

DCMimport has one AE. Its AE title is set in Setup → Dicom Server (default **DCMIMPORT**) and is used as calling AE title for all associations it initiates and as called AE title of the gateway.

3.2.1 SOP classes

3.2.1.1 As SCU

SOP Class	UID
Verification	1.2.840.10008.1.1
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31
Patient Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1

SOP Class	UID
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1
Any Storage SOP Class	the SOP Class UID of the image being sent

3.2.1.2 As SCP

The gateway accepts Verification (1.2.840.10008.1.1) and every Storage SOP Class that fo-dicom 5.2.6 knows (270 SOP classes). That list covers all standard image, presentation state, structured report, waveform, raw data, encapsulated document and other storage SOP classes of the DICOM edition fo-dicom 5.2.6 is built on, and a number of well-known private storage SOP classes. Examples:

SOP Class	UID
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2
Ultrasound Image Storage / Multi-frame	1.2.840.10008.5.1.4.1.1.6.1 / .3.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128
Enhanced CT / MR Image Storage	1.2.840.10008.5.1.4.1.1.2.1 / .4.1
Video Photographic / Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1 / .1.1.1
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1
Basic Text / Enhanced / Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.11 / .22 / .33
Key Object Selection Document Storage	1.2.840.10008.5.1.4.1.1.88.59
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1
RT Plan / RT Structure Set / RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.5 / .3 / .2
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66

A presentation context with a SOP class that fo-dicom does not know (for example an unknown private SOP class) is rejected with *abstract syntax not supported*. The other presentation contexts of the association are handled normally.

3.2.2 Association policies

Item	Value
Application Context Name	1.2.840.10008.3.1.1.1
Implementation Class UID	1.3.6.1.4.1.30071.8 (fo-dicom)
Implementation Version Name	fo-dicom 5.2.6
Maximum PDU size received	262144 bytes (fo-dicom default)
Asynchronous operations	Not negotiated (window 1)
SOP class extended negotiation	Not supported
Association request timeout (SCU)	10 seconds

Number of associations. As SCU DCMimport opens one association per Echo or query. When sending, every server gets its own associations, one after another, each with up to 250 images; up to *Servers at the same*

time servers (default 2, at most 8) are sent to simultaneously. As SCP, the gateway supports multiple simultaneous associations. DCMimport does not impose a configurable fixed association limit.

3.2.3 Association initiation policy

Activity – Echo

One presentation context: Verification with Implicit VR Little Endian (1.2.840.10008.1.2). Success when the C-ECHO response has status Success (0000).

Activity – Get Dicom Worklist

One presentation context: Modality Worklist Information Model – FIND with Implicit VR Little Endian. One C-FIND request per search. Pending responses (FF00, FF01) are collected; a Failure status is shown to the user with its code. Cancel stops waiting for the answers.

The identifier contains every request tag of Setup → Dicom Worklist Request Tags (return key; matching key when it has a standard value), plus the return keys that DCMimport needs itself. Scheduled Procedure Step attributes (group 0040 below element 0100, and Modality) are sent inside the Scheduled Procedure Step Sequence.

Attribute	Tag	Use
Specific Character Set	(0008,0005)	ISO_IR 100 or ISO_IR 192 when chosen in Setup; else absent
Patient's Name	(0010,0010)	Return key; matching key when typed in the search window (see below)
Patient ID	(0010,0020)	Return key; matching key when typed in the search window
Patient's Birth Date	(0010,0030)	Return key
Patient's Sex	(0010,0040)	Return key
Issuer of Patient ID	(0010,0021)	Return key
Accession Number	(0008,0050)	Return key
Referring Physician's Name	(0008,0090)	Return key
Study Instance UID	(0020,000D)	Return key
Requested Procedure ID	(0040,1001)	Return key
Requested Procedure Description	(0032,1060)	Return key
Scheduled Procedure Step Sequence	(0040,0100)	One item with the keys below
> Scheduled Procedure Step Start Date	(0040,0002)	Return key; range of today when <i>Today</i> is checked
> Modality	(0008,0060)	Return key; matching key when it has a standard value
> Scheduled Station AE Title	(0040,0001)	Return key; matching key when it has a standard value
> Scheduled Station Name	(0040,0010)	Return key (default request tag); matching key when it has a standard value
> Scheduled Procedure Step Location	(0040,0011)	Return key (default request tag)
Study ID	(0020,0010)	Return key (default request tag)
Study Description	(0008,1030)	Return key (default request tag)
Other request tags	as set in Setup	Return key; matching key when it has a standard value

Text typed in the search window is sent with wildcards on both sides (*text*), unless it contains * or ? itself; an empty field is a universal match. Answers without a value for a key are accepted.

Activity – Query PACS

One presentation context: Study Root (default) or Patient Root Query/Retrieve Information Model – FIND, with Implicit VR Little Endian. One C-FIND request at STUDY or PATIENT level. Relational queries are not used.

Attribute	Tag	Use
Query/Retrieve Level	(0008,0052)	STUDY (Study Root) or PATIENT (Patient Root)
Specific Character Set	(0008,0005)	ISO_IR 100 or ISO_IR 192 when chosen in Setup; else absent
Patient's Name	(0010,0010)	Matching key (wildcards as for the worklist), else universal
Patient ID	(0010,0020)	Matching key (wildcards as for the worklist), else universal
Patient's Birth Date	(0010,0030)	Matching key when given, else universal
Patient's Sex	(0010,0040)	Return key
Issuer of Patient ID	(0010,0021)	Return key
Study Instance UID, Study Date, Study Description, Modalities in Study	(0020,000D) (0008,0020) (0008,1030) (0008,0061)	Return keys, Study Root only
Number of Patient Related Studies	(0020,1200)	Return key, Patient Root only

Activity – Store Selected Patient

For every SOP class among the images to send, DCMimport proposes two presentation contexts:

- the SOP class with the transfer syntax in which the image is stored (the syntax of the media or of the sender; DCMimport does not compress);
- the SOP class with Implicit VR Little Endian.

When the SCP accepts only the Implicit VR Little Endian context for a compressed image, the image is decompressed for the transfer (tested with JPEG Lossless and JPEG 2000 Lossless: identical pixels).

Video (MPEG-2, MPEG-4 AVC/H.264, HEVC) cannot be decompressed and is proposed in its own transfer syntax only. When the SCP does not accept that syntax, the video is marked as failed and nothing is sent.

C-STORE status	Behaviour
Success (0000)	The image is marked as sent to that server (green in the tree).
Warning (B000, B007, B006)	Treated as success; the status is kept in the tooltip.
Failure (any other)	The image is marked as failed for that server (red), with the status. The Send button of the send window sends it again, only to the servers where it failed.
No response, association rejected or aborted, cancel	Every image of the batch without a response is marked failed with the reason.

DCMimport sends the working copy as it is: after reconciliation, with the changes of Appendix B. SOP Instance UIDs are never changed. Without a valid license (demo mode) Patient's Name and Patient ID of every image sent are replaced by DEMO_<timestamp> and ID_<timestamp> and all other occurrences of the real name and ID are removed; the working copy is not changed.

3.2.4 Association acceptance policy

The gateway accepts an association from any AE by default. Two options in Setup → Dicom Server restrict it:

Option	Effect
Accept only own AE-title	An association with another called AE title is rejected (permanent, service user, reason 7 <i>called AE title not recognized</i>).
Accept only known senders	An association from a calling AE title that is not in External Dicom Servers is rejected (permanent, service user, reason 3 <i>calling AE title not recognized</i>).

AE titles are compared without leading or trailing spaces and without regard to case. Every rejection is recorded in History with calling AE, called AE and IP address.

Activity – Receive images

For every proposed Storage or Verification presentation context, the gateway accepts one of the proposed transfer syntaxes, compressed ones included; decoding and conversion are limited to the transfer syntaxes supported by the included fo-dicom codecs. The choice depends on Setup → Dicom Server → Incoming Compression:

Incoming Compression	Transfer syntax accepted and stored
Do not change (default)	The first transfer syntax proposed by the SCU. The image is stored as received.
Uncompress	Explicit VR Little Endian, else Implicit VR Little Endian, when proposed; else the first proposed. A compressed image is decompressed to Explicit VR Little Endian before it is stored.
Jpeg Lossless	JPEG Lossless SV1 (1.2.840.10008.1.2.4.70) when proposed; else the first proposed. The image is compressed to JPEG Lossless SV1 before it is stored.

When decompressing or compressing is not possible, the image is stored as received. Images without Pixel Data are always stored as received.

C-STORE status	Meaning
Success (0000)	The image is written completely to the data folder. From then on it is kept, even when DCMimport stops before it appears in the tree (it is added at the next start).
Processing failure (0110)	The image could not be written (for example a full disk).

The gateway does not check the content of the image and does not reject duplicates. An image that is already in the list is handled as for an import (replaced when not yet reconciled or sent, else kept).

Activity – Verification

C-ECHO is answered with Success (0000).

3.3 Network interfaces

- TCP/IP through the network interface of Windows. IPv4; IPv6 when the address of a server is an IPv6 address or a name that resolves to one.
- The gateway listens on all interfaces on its port (default 4001). The setup creates a Windows Firewall rule that allows inbound connections for DCMimport.exe (any port).
- No TLS: DICOM connections are not encrypted. Use DCMimport inside the hospital network.

3.4 Configuration

Parameter	Where	Default
Own AE title	Setup → Dicom Server	DCMIMPORT

Parameter	Where	Default
Gateway on/off, port	Setup → Dicom Server	on, 4001
Accept only own AE-title / known senders	Setup → Dicom Server	off / off
Incoming Compression	Setup → Dicom Server	Do not change
Worklist server (AE title, host, port), character set	Setup → Dicom Worklist Connection	–
Worklist request tags and standard values	Setup → Dicom Worklist Request Tags	see 3.2.3
PACS (AE title, host, port), query model, character set	Setup → Dicom Query Connection	Study Root
Storage servers (name, AE title, host, port)	Setup → External Dicom Servers	–

The remote AE titles, hosts and ports are configured in DCMimport; DCMimport's calling AE title and, where required, the IP address of the computer must be registered in the PACS/worklist systems. Systems that send images to the DCMimport gateway need its AE title, IP address and gateway port.

4 Media interchange

DCMimport reads DICOM files from CD, DVD, USB media and folders (Quick Import, Import Folder → Import Dicom). It does not use the DICOMDIR: all files of the media or folder are read, in all subfolders, and every file with a DICOM header and a SOP Instance UID is imported. The DICOMDIR itself and other files are skipped.

The files are copied to working copies; the media are never written or changed. DCMimport does not write media and does not claim conformance to a Media Storage Application Profile as FSC, FSU or FSR.

5 Support of character sets

- Imported and received images keep their Specific Character Set. DCMimport reads all character sets that fo-dicom supports, including ISO 2022 code extensions.
- When a value written by reconciliation cannot be encoded in the character set of the image, the image is converted to ISO_IR 192 (UTF-8). Existing values are kept.
- Images created by DCMimport (Appendix A) use ISO_IR 192.
- Worklist and PACS queries are sent with ISO_IR 100, ISO_IR 192 or no Specific Character Set, as chosen per connection. Answers are decoded with the character set they declare.

6 Security

- No secure transport (TLS), no user identity negotiation and no audit trail messages (ATNA).
- The gateway can be restricted to its own AE title and to known senders (3.2.4).
- DCMimport records imports, reconciliations, sends, removals and rejected associations in its local History.
- The data folder holds patient data. Protect and clean it according to the policies of the organization (see the user manual, chapter 11).

Appendix A IODs created by DCMimport

DCMimport creates new SOP instances only when a user imports non-DICOM files (Import Folder → Import Jpeg/Bmp and Import MPeg). The patient is chosen by the user; the instances belong to a new study and series.

Source	SOP Class	Transfer syntax
JPEG, BMP, PNG or TIFF image	Secondary Capture Image Storage (1.2.840.10008.5.1.4.1.1.7)	Explicit VR Little Endian, RGB 8 bit
MP4 (H.264) or MPEG-2 video	Video Photographic Image Storage (1.2.840.10008.5.1.4.1.1.77.1.4.1)	The MPEG-4 AVC/H.264 or MPEG-2 syntax of the video (1.2.840.10008.1.2.4.100-.104); the stream is not re-encoded

Attribute	Tag	Value
Specific Character Set	(0008,0005)	ISO_IR 192
SOP Instance UID	(0008,0018)	New, 2.25 (UUID-derived)
Study / Series Instance UID	(0020,000D) / (0020,000E)	New per import
Patient's Name, Patient ID	(0010,0010) / (0010,0020)	As entered by the user
Patient's Birth Date, Patient's Sex	(0010,0030) / (0010,0040)	Empty; filled in by reconciliation
Study Date / Time, Content Date / Time		Time of the import
Study ID, Accession Number, Referring Physician's Name		Empty; filled in by reconciliation
Study Description	(0008,1030)	<i>Imported images or Imported video</i>
Modality	(0008,0060)	OT (images), XC (video)
Conversion Type	(0008,0064)	WSD (images)
Series Description	(0008,103E)	File name (video)
Image Type	(0008,0008)	DERIVED\SECONDARY (video)

Appendix B Attribute coercion (reconciliation)

Change Patient Data changes the working copies of the selected patient, study or series (a series always with its whole study) according to the IHE Import Reconciliation Workflow. Only attributes with a new value are changed. SOP, series and study instance UIDs are never changed.

Attribute	Change
Attributes in the request tag list	Replaced by the new value. The default list: Patient's Name, Patient ID, Patient's Birth Date, Patient's Sex, Issuer of Patient ID, Study ID, Accession Number, Study Description, Referring Physician's Name, Scheduled Procedure Step Start Date, Scheduled Station Name and Scheduled Procedure Step Location.
Study ID (0020,0010), Study Description (0008,1030)	From the worklist: Requested Procedure ID and Requested Procedure Description.
Request Attributes Sequence (0040,0275)	Request tags of group 0040 (for example Scheduled Station Name, Scheduled Procedure Step Location, Scheduled Procedure Step ID) are written into one item of this sequence, not at the top level.
Original Attributes Sequence (0400,0561)	One item per reconciliation, added to existing items: Modified Attributes Sequence (0400,0550) with the previous values, Source of Previous Values (0400,0564) = the Institution Name of the image, Attribute Modification DateTime (0400,0562), Modifying System (0400,0563) = <i>SUP-C DCMIMPORT</i> , Reason for the Attribute Modification (0400,0565) = <i>COERCE</i> .
Other Patient IDs Sequence (0010,1002)	When Patient ID changes: one item with the previous Patient ID, its Issuer of Patient ID and Type of Patient ID (0010,0022) = <i>TEXT</i> .
Specific Character Set (0008,0005)	ISO_IR 192 when a new value does not fit the existing character set (chapter 5).

Values containing a backslash are refused, so that a value never becomes two DICOM values. DCMimport does not add private attributes.