

# AGFA HEALTHCARE DICOM Conformance Statement



## CR QS 3.5

Status: Released

Document number 001076 Revision 1.2

NodeID Livelink : 9970858

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## Conformance Statement Overview

The CR QS, implements the necessary DICOM services to facilitate receiving of unprocessed CR images from an AGFA Digitizer, performing image processing and sending the processed images to a remote storage or print device over a Medical Imaging Systems network. The QS may also acquire patient information from a Radiology Information System (RIS) for use in identifying processed images.

**Table 1.1-1: Network Services Supported**

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
<b>Transfer</b>		
Computed Radiography Image Storage	Yes, if license is enabled	No
<b>Workflow Management</b>		
Modality Worklist Information Model – FIND	Yes, if license is enabled	No
<b>Print Management</b>		
Basic Grayscale Print Management Meta SOP Class	Yes	No

**Table 1.1-2: Media Services Supported**

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
<b>Compact Disk – Recordable</b>		
General Purpose CD-R	Yes, if license is enabled	No

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# 1 INTRODUCTION

## 1.1 Revision Record

Revision Number	Date	Reason for Change
1.0	January 2006	Initial revision
1.1	May 12,2006	Post processing added
1.2	January 2007	Update DCS to give possible / default attributes of Film Box & Image box

## 1.2 Purpose and Intended Audience of this Document

This document is a DICOM Conformance Statement for the DICOM Services of the *CR QS* product.

The user of this document is involved with system integration and/or software design. We assume that the reader is familiar with the terminology and concepts that are used in the DICOM 3.0 standard and the IHE Technical Framework.

Readers not familiar with DICOM 3.0 terminology should first read the appropriate parts of the DICOM standard itself, prior to reading this conformance statement.

Although the use of this conformance statement in conjunction with the DICOM 3.0 standard is intended to facilitate communication with Agfa CR imaging equipment, it is not sufficient to guarantee, by itself, the inter-operation of the connection. The following issues need to be considered:

## 1.3 General Remarks

### 1.3.1 Integration and Validation Activities

The integration of any device into a system of interconnected devices goes beyond the scope of the DICOM 3.0 standard and this conformance statement when *interoperability* is desired. The responsibility for analyzing the applications requirements and developing a solution that integrates the Agfa equipment with other vendors' systems is the user's responsibility and should not be underestimated.

In some circumstances it might be necessary to perform a validation to make sure that functional interoperability between the Agfa equipment and non-Agfa devices works as expected. The user should ensure that any non-Agfa provider accepts responsibility for any validation required for their connection with the Agfa equipment.

### 1.3.2 Future Evolution

As the DICOM 3.0 standard evolves to meet the user's growing requirements and to incorporate new features and technologies, Agfa will follow the evolution of the standard. This evolution of the standard may require changes to devices that have implemented DICOM 3.0. The user should ensure that any non-Agfa provider, who connects with Agfa devices, also plans for future evolution of the DICOM standard. A refusal to do so may result in the loss of functionality and/or connectivity between the different products.

## 1.4 Acronyms and Abbreviations

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

AE	DICOM Application Entity
AET	Application Entity Title
ASCE	Association Control Service Element
CD-R	Compact Disk Recordable
DICOM	Digital Imaging and Communications in Medicine
FSC	File-Set Creator
FSU	File-Set Updater
FSR	File-Set Reader
GSDF	Grayscale Standard Display Function
GSPS	Grayscale Softcopy Presentation State
IE	Information Entity
IOD	(DICOM) Information Object Definition
ISO	International Standard Organization
MSPS	Modality Scheduled Procedure Step
PDU	DICOM Protocol Data Unit
SCU	DICOM Service Class User (DICOM client)
SCP	DICOM Service Class Provider (DICOM server)
SOP	DICOM Service-Object Pair
UID	Unique Identifier
VR	Value Representation

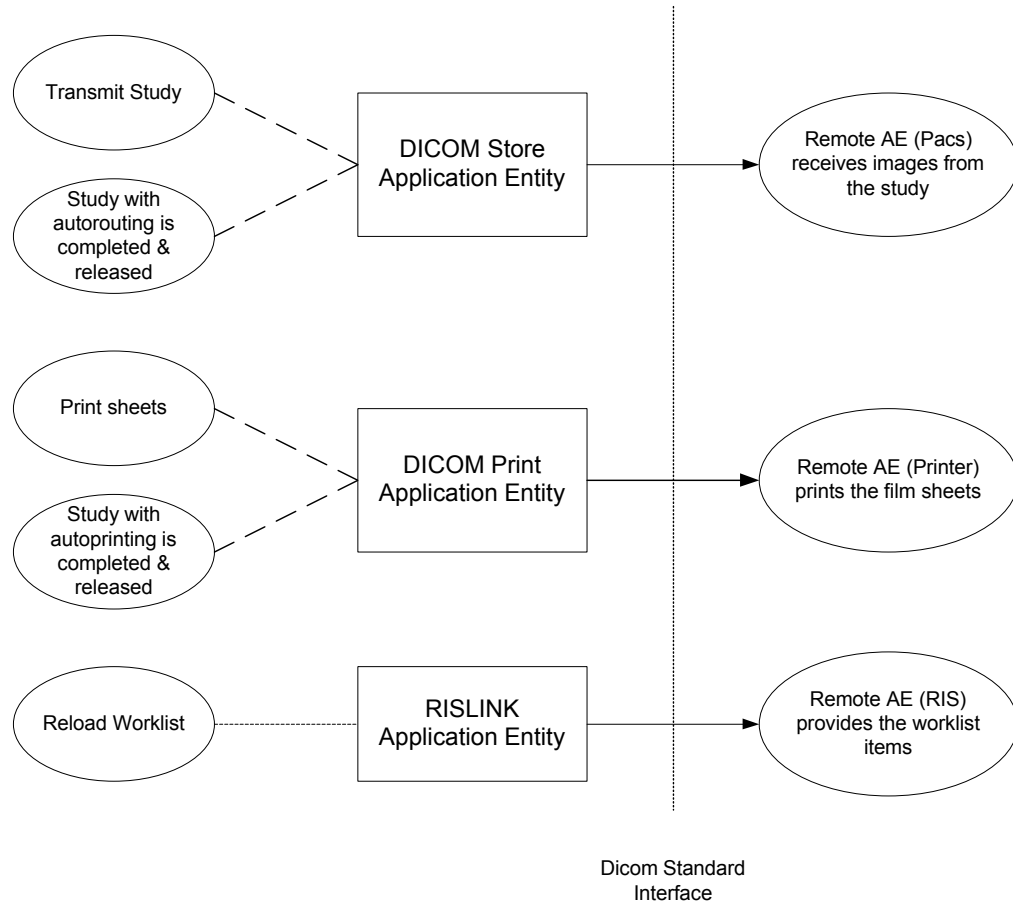
## 1.5 Related Documents

- ACR-NEMA Digital Imaging and Communications in Medicine (DICOM) V3.0. 2004

## 2 NETWORKING

### 2.1 Implementation Model

#### 2.1.1 Application Data Flow Diagram



**Figure 2.1-1: Functional Overview – Application Data Flow**

- The DICOM Store AE sends images to a remote AE (e.g a PACS system). It can be activated manually (Transmit Study) or automatically (Auto routing on completion of a study)
- The DICOM Print AE prints sheets on a remote printer. It can be activated manually (Print Study or via Print Composer) or automatically (Auto printing on completion of a study)
- The RISLINK AE receives Worklist information from a remote AE (e.g. a RIS system). It is activated manually with a Query RIS request in ID Viewer

## **2.1.2 Functional Definitions of AE's**

### **2.1.2.1 Functional Capability of DICOM Store AE**

The existence of a send-job in the queue will activate the DICOM Store AE. An association request is sent to the destination AE and upon successful negotiation of a Presentation Context the image transfer is started. If the association cannot be opened, the study's routing status will get a "FAILED" state, another attempt will not be initiated automatically.

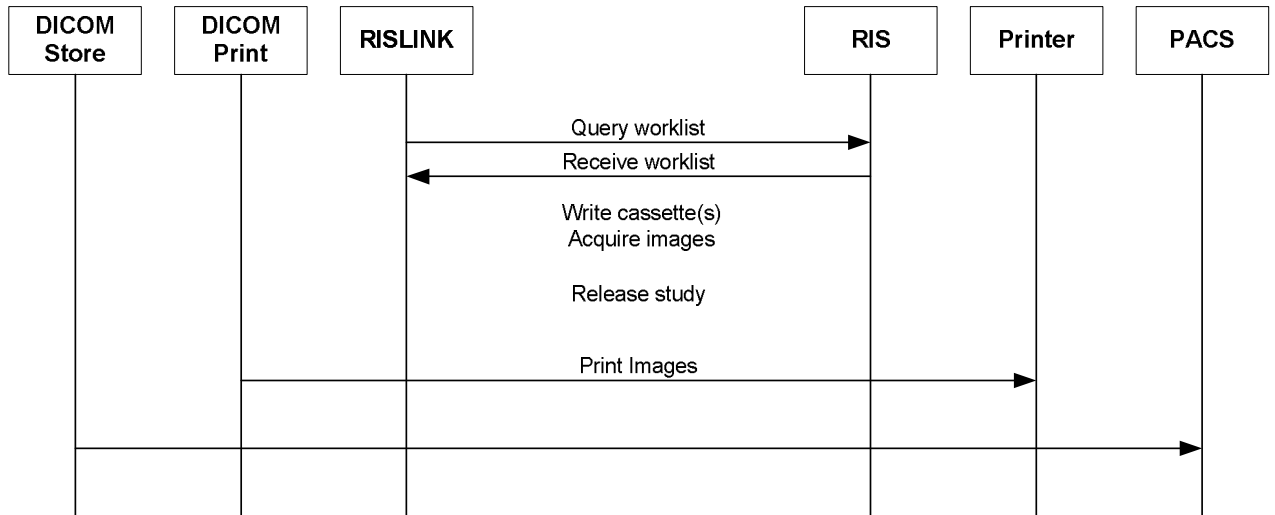
### **2.1.2.2 Functional Capability of DICOM Print AE**

The existence of a print-job for a QS configured DICOM printer in the Windows print spooler will activate the DICOM Print AE. An association is established with the printer and the printer's status determined. If the printer is operating normally, the film sheets described within the print-job will be printed. Changes in printer status will be detected (e.g. out of film) and reported to the user. If the printer is not operating normally, the print-job will be set to an error state and can be restarted by the Windows spooler.

### **2.1.2.3 Functional Capability of RISLINK AE**

Query RIS attempts to download a Worklist from a remote node. If the RISLINK AE establishes an Association to a remote AE, it will transfer all worklist items via the open Association.

### 2.1.3 Sequencing of Real World Activities



**Figure 2.1-2: Sample sequence**

A typical workflow using QS would look like this:

1. Query the RIS for a Worklist
2. Receive the worklist and select the study
3. Identify the exposed cassette(s) for the study and digitize them
4. Release the study after some adjustments
5. Images are auto printed and auto routed

## 2.2 AE Specifications

### 2.2.1 DICOM Store AE Specification

#### 2.2.1.1 SOP Classes Supported

This Application Entity provides Standard Conformance to the following SOP Class(es):

**Table 2.2-1: SOP Classes for DICOM Store**

SOP Class Name	SOP Class UID	SCU	SCP
CR Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes	No
Verification	1.2.840.10008.1.1	Yes	Yes

## 2.2.1.2 Association Establishment Policies

### 2.2.1.2.1 General

The DICOM standard Application context is always proposed:

**Table 2.2-2: DICOM Application Context**

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

### 2.2.1.2.2 Number of Associations

CR QS initiates one Association at a time.

**Table 2.2-3: Number of Associations as an Association Initiator for DICOM Store AE**

Maximum number of simultaneous associations initiated	1
---	---

**Table 2.2-4: Number of Associations as an Association Acceptor for DICOM Store AE**

Maximum number of simultaneous associations accepted	1
--	---

### 2.2.1.2.3 Asynchronous Nature

The DICOM Store AE allows a single outstanding operation on any association. Therefore, it does not support asynchronous operations window negotiation, other than the default as specified by the DICOM specification.

**Table 2.2-5: Asynchronous Nature as an Association Initiator for DICOM Store**

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

### 2.2.1.2.4 Implementation Identifying Information

The Implementation information for this Application Entity is:

**Table 2.2-6: DICOM implementation Class and Version for DICOM Store AE**

Implementation Class UID	1.3.51.0.1.3
Implementation Version Name	AGFA DTF1.0.87

### 2.2.1.3 Association Initiation Policies

#### 2.2.1.3.1 Transmit Study

##### 2.2.1.3.1.1 Description and Sequencing of Activity

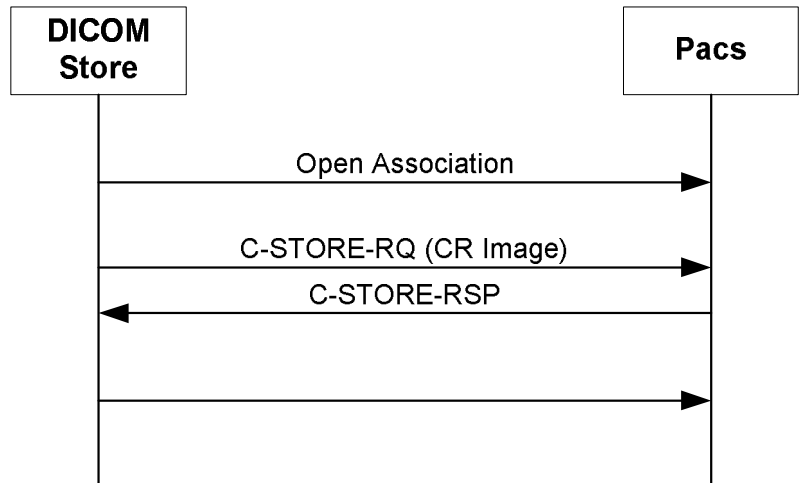


Figure 2.2-1: Sample DICOM Store Sequencing Diagram

##### 2.2.1.3.1.2 Proposed Presentation Contexts

The DICOM Store AE will propose the Presentation Context shown below:

Table 2.2-7: Presentation Contexts Proposed by DICOM Store AE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
CR Image Storage	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

##### 2.2.1.3.1.3 SOP Specific Conformance – CR Image Storage SOP Class

The behavior of the DICOM Store AE when encountering status codes in a C-STORE response is summarized in the Table below:

**Table 2.2-8: DICOM Command Response Status Handling Behavior**

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The routingstatus of the study will be set to done.
Warning	Coercion of Data Elements	B000	The routingstatus of the study will be set to done. A warning will be logged
	Data Set does not match SOP Class	B007	The routingstatus of the study will be set to done. A warning will be logged
	Elements Discarded	B006	The routinstatus of the study will be set to done A warning will be logged
Failure	Refused: Out of Resources	A7xx	The routingstatus of the study will bet set to failed. An error will be logged.
	Error: Data Set does not match SOP Class	A9xx	The routingstatus of the study will be set to failed An error will be logged
	Error: Cannot understand	Cxxx	The routingstatus of the study will be set to failed An error will be logged

The behavior of the AE during communication failure is summarized in a table as follows:

**Table 2.2-9: DICOM Command Communication Failure Behavior**

Exception	Behavior
Timeout	The routingstatus of the study will be set to failed. An error will be logged..
Association aborted by SCP or network layers	The routingstatus of the study will be set to failed. An error will be logged.

## 2.2.2 DICOM Print AE Specification

### 2.2.2.1 SOP Classes Supported

This Application Entity provides Standard Conformance to the following SOP Class(es):

**Table 2.2-10: SOP Class(es) for DICOM Print AE**

SOP Class Name	SOP Class UID	SCU	SCP
<b>Print Management</b>			
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Yes	No
Verification SOP	1.2.840.10008.1.1	Yes	Yes

## 2.2.2.2 Association Establishment Policies

### 2.2.2.2.1 General

**Table 2.2-11: DICOM Application Context**

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

### 2.2.2.2.2 Number of Associations

**Table 2.2-12: Number of Associations as an Association Initiator for DICOM Print AE**

Maximum number of simultaneous associations initiated	1
---	---

### 2.2.2.2.3 Asynchronous Nature

The DICOM Print AE allows a single outstanding operation on any association. Therefore, it does not support asynchronous operations window negotiation, other than the default as specified by the DICOM specification.

**Table 2.2-13: Asynchronous Nature as an Association Initiator for DICOM Print AE**

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

### 2.2.2.2.4 Implementation Identifying Information

**Table 2.2-14: DICOM implementation Class and Version for DICOM Print AE**

Implementation Class UID	1.3.51.0.1.3
Implementation Version Name	Dicom Print

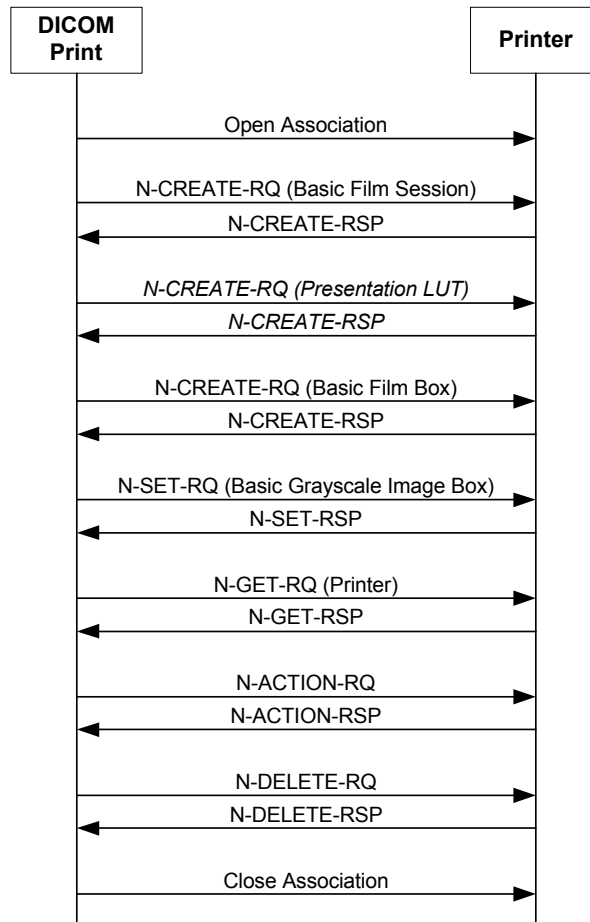
## 2.2.2.3 Association Initiation Policies

### 2.2.2.3.1 Activity – Print sheets to remote Printer

The DICOM Print AE processes print jobs to DICOM printers that are waiting in the Windows Print Spooler.

The Print Jobs are created either automatically with auto printing or when the user manually asks prints (e.g. via Print Composer). The film sheets are internally processed and rendered to STANDARD/1,1 pages. Then these pages will be sent from QS to Printer.

### 2.2.2.3.1.1 Description and Sequencing of Activity



**Figure 2.2-2: Sample Print Sequencing Diagram**

A typical sequence of DIMSE messages sent over an association between the DICOM Print AE and a Printer is illustrated in Figure 2.2-2:

1. DICOM Print AE opens an association with the Printer
2. N-CREATE on the Film Session SOP Class creates a Film Session
3. N-CREATE on the Presentation LUT SOP Class creates a Presentation LUT (if configured for the printer)
4. N-CREATE on the Film Box SOP Class creates a Film Box linked to the Film Session. A single image box will be created as the result of this operation (only the STANDARD\1,1 format is used)
5. N-SET on the Image Box SOP Class transfers the contents of the film sheet to the printer.
6. N-GET on the Printer SOP Class is used to obtain current printer status information.
7. N-ACTION on the Film Box SOP Class instructs the printer to print the Film Box
8. N-DELETE on the Film Session SOP Class deletes the complete Film Session SOP Instance hierarchy
9. DICOM Print AE closes the association with the Printer

### 2.2.2.3.1.2 Proposed Presentation Contexts

**Table 2.2-15: Presentation Contexts Proposed by DICOM Print AE**

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian	Implicit VR Little Endian	SCP	None
Print Job SOP Class	1.2.840.10008.5.1.1.14	Implicit VR Little Endian	Implicit VR Little Endian	SCP	None
Basic Annotation Box SOP Class	1.2.840.10008.5.1.1.15	Implicit VR Little Endian	Implicit VR Little Endian	SCP	None
<i>Presentation LUT SOP Class (See Note)</i>	<i>1.2.840.10008.5.1.1.23</i>	<i>Implicit VR Little Endian</i>	<i>Implicit VR Little Endian</i>	<i>SCP</i>	<i>None</i>
Print Queue Management SOP Class	1.2.840.10008.5.1.1.26	Implicit VR Little Endian	Implicit VR Little Endian	SCP	None

**Note :**

The Presentation LUT SOP Class is only proposed when the printer is configured with Rescale Type "Perception"

### 2.2.2.3.1.3 Common SOP Specific Conformance for all Print SOP Classes

The general behavior of the DICOM Print AE during communication failure is summarized in the table below. This behavior is common for all SOP Classes supported by the DICOM Print AE.

**Table 2.2-16: DICOM Command Communication Failure Behavior**

Exception	Behavior
Timeout	An error is logged in the event viewer and shown to the user. The job gets an error status in the windows spooler.
Association aborted by SCP or network layers	An error is logged in the event viewer and shown to the user. The job gets an error status in the windows spooler.

### 2.2.2.3.1.4 SOP Specific Conformance – Printer SOP Class

The DICOM Print AE uses the Printer SOP Class N-GET operation to obtain information about the current printer status. The behaviour of the AE when encountering status codes in a N-GET response is summarized in the Table below:

**Table 2.2-17: DICOM Command Response Status Handling Behavior**

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The request to get printer status information was successful
*	*	Any other status code	The get printer status information was not successful, the printing will continue without checking the print status

If the N-GET was successful the Printer status is evaluated as follows:

**Table 2.2-18: Printer Status Handling Behavior**

Printer Status	Behavior
NORMAL	The job continues to be printed
WARNING	The job continues to be printed
FAILURE	An error (Printer Status (2110,0010)=FAILURE!) is logged in the event viewer and shown to the user. The job gets an error status in the windows spooler.

### 2.2.2.3.1.5 SOP Specific Conformance – Film Session SOP Class

The AE supports the following DIMSE operations for the Film Session SOP Class:

➤ N-CREATE

The attributes supplied in an N-CREATE request are listed in the table below:

**Table 2.2-19: Film Session SOP CLASS N-CREATE request attributes**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Number of Copies	(2000,0010)	IS		ALWAYS	User
Print Priority	(2000,0020)	CS	HIGH	ALWAYS	Fixed
Medium Type	(2000,0030)	CS	BLUE FILM, CLEAR FILM	ALWAYS	Config
Film Destination	(2000,0040)	CS	PROCESSOR	ALWAYS	Fixed
Film Session Label	(2000,0050)	LO		ALWAYS	AUTO

The behavior of the DICOM Print AE when encountering status codes in a N-CREATE response is summarized in the table below:

**Table 2.2-20: Film Session SOP CLASS N-CREATE Response Status Handling Behavior**

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully
Warning	Attribute Value Out of Range	0116H	The job continues to be printed
Warning	Attribute List Error	0107H	The job continues to be printed
Warning	Memory allocation not supported	B600H	The job continues to be printed

Service Status	Further Meaning	Error Code	Behavior
*	*	Any other status code	The association is aborted. An error is logged in the event viewer and shown to the users. The job gets an error status in the windows spooler.

### 2.2.2.3.1.6 SOP Specific Conformance – Film Box SOP Class

The DICOM Print AE supports the following DMSE operations for the Basic Film Box SOP Class:

- N-CREATE
- N-ACTION
- N-DELETE

#### 2.2.2.3.1.6.1 Film Box SOP Class Operations (N-CREATE)

The attributes supplied in an N-CREATE Request are listed in the Table below:

**Table 2.2-21: Film Box SOP Class N-CREATE Request attributes**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Display Format	(2010,0010)	ST	STANDARD\1,1	ALWAYS	Fixed
Film Orientation	(2010,0040)	CS	PORTRAIT, LANDSCAPE	ALWAYS	Fixed
Film Size ID	(2010,0050)	CS	(Printer Dependent)	ALWAYS	USER
Border Density	(2010,0100)	CS	The desired density in hundredths of OD.	ALWAYS	AUTO
Empty Image Density	(2010,0110)	CS	BLACK	ALWAYS	Fixed
Min Density	(2010,0120)	US	The desired density in hundredths of OD.	ALWAYS	AUTO
Max Density	(2010,0130)	US	The desired density in hundredths of OD.	ALWAYS	AUTO
Trim	(2010,0140)	CS	NO	ALWAYS	AUTO
Configuration Information	(2010,0150)	ST	Printer Dependent	VNAP	USER
Presentation LUT shape	(2050,0020)	CS	IDENTITY	VNAP	USER
Illumination	(2010,015E)	US	Range 1.0 – 4000 cd/m <sup>2</sup>	ALWAYS	USER
Reflected Ambient Light	(2010,0160)	US	Range 1.0 – 500 cd/m <sup>2</sup>	ALWAYS	USER

The behavior of the DICOM Print AE when encountering status codes in a N-CREATE response is summarized in the Table below:

**Table 2.2-22: Film Box SOP CLASS N-CREATE Response Status Handling Behavior**

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully
Warning	Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead.	B605	The job continues to be printed
Failure	There is an existing Film Box that has not been printed and N-ACTION at the Film Session level is not supported. A new Film Box will not be created when a previous Film Box has not been printed.	C616	The association is aborted. An error is logged in the event viewer and shown to the users. The job gets an error status in the windows spooler
*	*	Any other status code	The association is aborted. An error is logged in the event viewer and shown to the users. The job gets an error status in the windows spooler

### 2.2.2.3.1.6.2 Film Box SOP Class Operations (N-ACTION)

The attributes supplied in an N-ACTION request are listed in the Table below:

**Table 2.2-23: Film Box SOP Class N-ACTION Request attributes**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Action Type ID	(0000,1008)	US	1	ALWAYS	AUTO

The behavior of the DICOM Print AE when encountering status codes in a N-CREATE response is summarized in the Table below:

**Table 2.2-24: Film Box SOP CLASS N-CREATE Response Status Handling Behavior**

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully
Warning	Film Box SOP Instance hierarchy SOP Instances (empty page)	B603	The job continues to be printed
Warning	Image size is larger than image box size, the image has been demagnified	B604	
Warning	Image size or Combined Print Image size is larger than the Image Box size. Image or Combined Print Image has been decimated to fit.	B60A	
Failure	Unable to create Print Job SOP Instance; print queue is full	C602	
Failure	Image size is larger than image box size	C603	
Failure	Combined Print Image size is larger than the Image Box size	C613	
*	*	Any other status code	

### 2.2.2.3.1.7 SOP Specific Conformance – Image Box SOP Class

The DICOM Print AE supports the following DMSE operations for the Basic Film Box SOP Class:

➤ N-SET

The attributes supplied in an N-CREATE Request are listed in the Table below.

**Table 2.2-25 Image BOX SOP Class N-SET Request attributes**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Position	(2020,0010)	US	1-xx	ALWAYS	AUTO
Basic Grayscale Image Sequence	(2020,0110)	SQ	1-xx	ALWAYS	AUTO
>Samples per Pixel	(0028,0002)	US	1	ALWAYS	FIXED
>Photometric Interpretation	(0028,0004)	CS	MONOCHROME2	ALWAYS	AUTO
>Rows	(0028,0010)	US	>0	ALWAYS	AUTO
>Columns	(0028,0011)	US	>0	ALWAYS	AUTO
>Bits Allocated	(0028,0100)	US	8	ALWAYS	AUTO
>Bits Stored	(0028,0101)	US	8	ALWAYS	AUTO
>High Bit	(0028,0102)	US	7	ALWAYS	AUTO
>Pixel Representation	(0028,0103)	OB/OW	0	ALWAYS	AUTO
>Pixel Data	(7FE0,0010)	IS	-	ALWAYS	-
Magnification Type	(2010,0060)	CS	(printer dependent)	ALWAYS	USER
Smoothing Type	(2010,0080)	CS	(printer dependent)	ALWAYS	USER
Polarity	(2020,0020)	CS	NORMAL	ALWAYS	AUTO

The behavior of DICOM Print AE when encountering status codes in a N-SET response is summarized in the table below.

**Table 2.2-26: Presentation LUT SOP CLASS N-CREATE Response Status Handling Behavior**

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully
Warning	Image size larger than image box size, the image has been demagnified.	B604	The job continues to be printed

Service Status	Further Meaning	Error Code	Behavior
Warning	Image size is larger than the Image Box size. The Image has been cropped to fit.	B609	
Warning	Image size or Combined Print Image size is larger than the Image Box size. The Image or Combined Print Image has been decimated to fit.	B60A	
Failure	Image size is larger than image box size		The association is aborted. An error is logged in the event viewer and shown to the users. The job gets an error status in the windows spooler
Failure	Insufficient memory in printer to store the image		
Failure	Combined Print Image Image Box size		
*	*	Any other status code	The association is aborted. An error is logged in the event viewer and shown to the users. The job gets an error status in the windows spooler

### 2.2.2.3.1.8 SOP Specific Conformance – Presentation LUT SOP Class

The DICOM Print AE supports the following DMSE operations for the Presentation LUT SOP Class:

➤ N-CREATE

The attributes supplied in an N-CREATE Request are listed in the Table below:

**Table 2.2-27: Presentation LUT SOP Class N-CREATE Request attributes**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Presentation LUT Shape	(2050,0020)	CS	IDENTITY	ALWAYS	AUTO

The behavior of DICOM Print AE when encountering status codes in a N-CREATE response is summarized in the table below.

**Table 2.2-28: Presentation LUT SOP CLASS N-CREATE Response Status Handling Behavior**

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully
Warning	Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead.	B605	
*	*	Any other status code	

#### 2.2.2.4 Association Acceptance Policy

The DICOM Print AE does not accept Associations

### 2.2.3 RISLINK AE Specification

#### 2.2.3.1 SOP Classes Supported

This Application Entity provides Standard Conformance to the following SOP Classes:

**Table 2.2-29: SOP Classes for RISLINK AE**

SOP Class Name	SOP Class UID	SCU	SCP
<b>Workflow Management</b>			
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Yes	No

## 2.2.3.2 Association Establishment Policies

### 2.2.3.2.1 General

The DICOM standard Application context shall be specified.

**Table 2.2-30: DICOM Application Context**

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

### 2.2.3.2.2 Number of Associations

**Table 2.2-31: Number of Associations as an Association Initiator for RISLINK AE**

Maximum number of simultaneous associations initiated	1
---	---

### 2.2.3.2.3 Asynchronous Nature

RISLINK allows a single outstanding operation on any association. Therefore, it does not support asynchronous operations window negotiation, other than the default as specified by the DICOM specification.

**Table 2.2-32: Asynchronous Nature as an Association Initiator for RISLINK**

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

### 2.2.3.2.4 Implementation Identifying Information

**Table 2.2-33: DICOM implementation Class and Version for RISLINK**

Implementation Class UID	1.3.51.0.1.3
Implementation Version Name	AGFA DTF1.0.87

### 2.2.3.3 Association Initiation Policies

#### 2.2.3.3.1 Activity – Load (worklist) from server

##### 2.2.3.3.1.1 Description and Sequencing of Activity

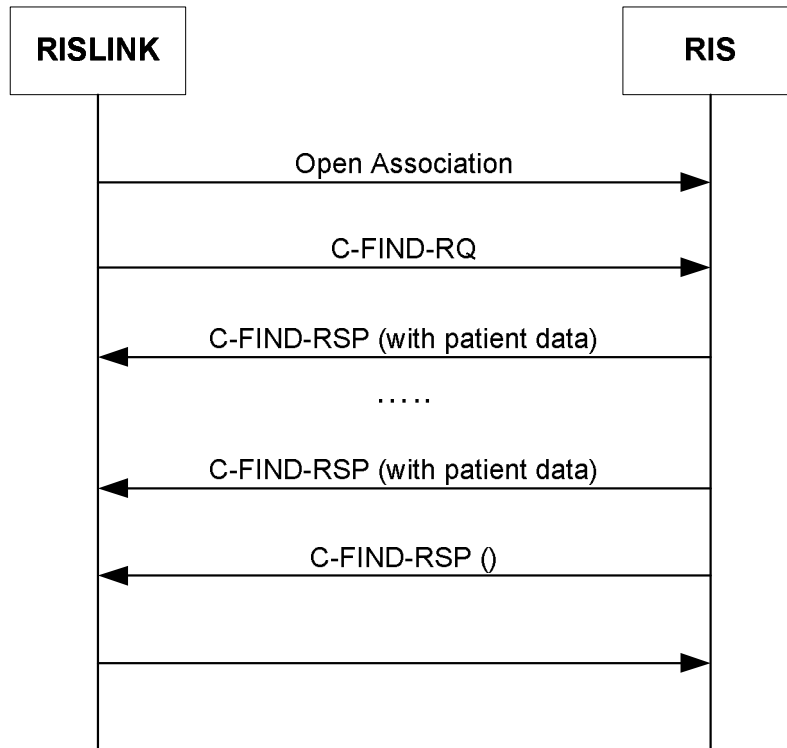


Figure 2.2-3: Sample AE Sequencing Diagram

##### 2.2.3.3.1.2 Proposed Presentation Contexts

Table 2.2-34: Presentation Contexts Proposed by RISLINK AE

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

##### 2.2.3.3.1.3 SOP Specific Conformance – Modality Worklist

The behavior of the RISLINK AE when encountering status codes in a Modality Worklist C-FIND response is summarized in a table as follows :

**Table 2.2-35: DICOM Command Response Status Handling Behavior**

Service Status	Further Meaning	Error Code	Behavior
Success	e.g. Matching is complete	0000	The SCP has successfully returned all matching information. The worklist items are displayed.
Cancel	Matching terminated due to Cancel request	FE00	The worklist items received thus far are displayed
Pending	Matches are continuing	FF00	The worklist item is collected for later display
Pending	Matches are continuing – warning that one or more optional keys were not supported	FF01	
Refused	Out of Resources	A700	A message box showing the error message is displayed.
Failed	Identifier does not match SOP Class	A900	
Failed	Unable to Process	C000-CFFF	
*	*		

The behavior of the AE during communication failure is summarized in a table as follows:

**Table 2.2-36: DICOM Command Communication Failure Behavior**

Exception	Behavior
Timeout	A message box showing the error message is displayed.
Association aborted	A message box showing the error message is displayed.

Acquired images will always use the Study Instance UID specified for the Scheduled Procedure Step (if available). If an acquisition is unscheduled, a Study Instance UID will be generated locally.

The table below provides a description of the Worklist Request identifiers and specifies the attributes that are copied into the image.

Attribute	Tag	W	P	R	D	IOD
Specific Character Set	0008,0005			X		
<b>Patient Identification Module</b>						
Patient Name	0010,0010		X	X	X	X
Patient Id	0010,2160		X	X	X	X
Other Patient IDs	0010,1000			X		X
<b>Patient Demographic Module</b>						
Patient's Birth Date	0010,0030			X	X	X
Patient's Birth Time	0010,0032			X		
Patient's Sex	0010,0040			X	X	X
Patient's Age	0010,1010		X			
Patient's Size	0010,1020			X		X
Patient's Weight	0010,1030			X		X

Attribute	Tag	W	P	R	D	IOD
Military Rank	0010,1080			X		
Ethnic Group	0010,2160			X		X
Occupation	0010,2180			X		X
Patient Comments	0010,4000			X	X	X
Patient Data Confidentiality Constraint Description	0040,3001			X		X
<b>Patient Medical Module</b>						
Medical Alerts	0010,0020			X		X
Contrast Allergies	0010,2110			X		X
Special Needs	0038,0050			X		X
Patient State	0038,0500			X		
<b>Visit Relationship Module</b>						
Referenced Patient Sequence	0008,1120			X		
>Referenced SOP Class UID	0008,1150			X		
>Referenced SOP Instance UID	0008,1155			X		
<b>Visit Identification Module</b>						
Admission ID	0038,0010			X		
<b>Visit Status Module</b>						
Current Patient Location	0038,0300			X		X
<b>Visit Admission Module</b>						
Admitting Diagnoses Description	0008,1080		X	X		X
<b>Scheduled Procedure Step Module</b>						
Scheduled Procedure Step Sequence	0040,0100			X		
>Modality	0008,0060	CR	CR	X		
>Requested Contrast Agent	0032,1070			X		
>Scheduled Station AE Title	0040,0001	X		X		
>Scheduled Procedure Step Start Date	0040,0002	X		X		
>Scheduled Procedure Step Start Time	0040,0003			X		
>Scheduled Performing Physician's Name	0040,0006	X		X		
>Scheduled Procedure Step Description	0040,0007			X		
>Scheduled Protocol Code Sequence	0040,0008			X		
>>Code Value	0008,0100			X		
>>Coding Scheme Designator	0008,0102			X		
>>Code Meaning	0008,0104			X		
>Scheduled Procedure Step ID	0040,0009			X		
>Scheduled Station Name	0040,0010			X		
>Scheduled Procedure Step Location	0040,0011			X		
>Pre-Medication	0040,0012			X		
>Scheduled Procedure Step Status	0040,0020			X		
<b>Requested Procedure Module</b>						
Referenced Study Sequence	0008,1110			X		
>Referenced SOP Class UID	0008,1150			X		
>Referenced SOP Instance UID	0008,1155			X		
Study Instance UID	0020,000D			X		X
Requested Procedure Description	0032,1060			X		

Attribute	Tag	W	P	R	D	IOD
Requested Procedure Code Sequence	0032,1064			X		
>Code Value	0008,0100			X		
>Coding Scheme Designator	0008,0102			X		
>Code Meaning	0008,0104			X		
Requested Procedure ID	0040,1001			X		
Reason for the Requested Procedure	0040,1002			X		
Requested Procedure Priority	0040,1003			X		
Patient Transport Arrangements	0040,1004			X		
<b>Imaging Service Request Module</b>				X		
Accession Number	0008,0050		X	X	X	X
Referring Physician's Name	0008,0090			X		X
Requesting Physician	0032,1032			X		
Requesting Service	0032,1033			X		
Placer Order Number/Imaging Service Request	0040,2016			X		
Filler Order Number/Imaging Service Request	0040,2017			X		
Imaging Service Request Comments	0040,2400			X		

The above table should be read as follows:

- Tag: DICOM Tag for this attribute
- W: Worklist oriented matching keys
- P: Patient oriented matching keys. Only 1 of these attributes can be specified for the query
- R: Return keys
- D: Default displayed attributes in IDViewer.
- IOD: An "x" indicates that this Worklist attribute is included into all Object Instances created during performance of the related Procedure Step.

## 2.3 Network Interfaces

The CR QS provides DICOM V3.0 TCP/IP Network Communication Support as defined in PS 3.8 of the DICOM Standard. The CR QS inherits its TCP/IP stack from the Windows system upon which it executes.

### 2.3.1 Physical Medium Support

The CR QS supports 100baseT and 1000baseT switched Ethernet networks.

### 2.3.2 Additional Protocols

The CR QS supports DNS as a DNS client.

## 2.4 Configuration

The configuration is done in the CR QS ConfigView.

## 2.4.1 AE Title/ Presentation Mapping

### 2.4.1.1 Local AE Titles

All the local AE's share a common AE title that can be configured.

**Table 2.4-1: AE Title Configuration Table**

Application Entity	Default AE Title	Default TCP/IP Port
DICOM Store, DICOM Print, RISLINK	ADC_QS	104

### 2.4.1.2 Remote AE Titles

#### 2.4.1.2.1 Remote Store SCPs

The CR QS ConfigView must be used to set the AE Titles, port-numbers, host-names and capabilities (SSL support, image type) for the remote Store SCPs.

Multiple remote Store SCPs can be configured in the ConfigView under Devices -> Destination.

#### 2.4.1.2.2 Remote Print SCPs

The CR QS ConfigView must be used to set the AE Titles, port-numbers, host-names and capabilities (printer model, supported film formats and type, SSL support, density parameters,..) for the remote Print SCPs.

Multiple remote Print SCPs can be configured in the ConfigView under Devices -> Medical Printers.

#### 2.4.1.2.3 Remote DMWL SCP

The CR QS ConfigView must be used to set the AE Title, port-number, host-name for the remote Worklist SCP.

Only a single Worklist SCP can be configured per machine.

## 2.4.2 Configuration Parameters

A large number of parameters can be configured using the Config Tool. The table below only shows those relevant to DICOM communication.

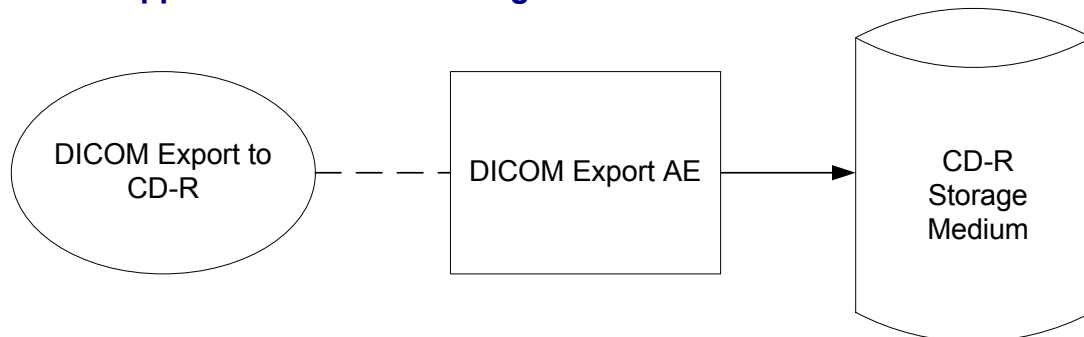
**Table 2.4-2: Configuration Parameter Table**

Parameter	Configurable (Yes/No)	Default Value
<b>General Parameters</b>		
Maximum PDU size the AE can receive	No	65542
Maximum PDU size the AE can send	No	65542
Time-out waiting for acceptance or rejection Response to an Association Open Request. (Application Level timeout)	No	
General DIMSE level time-out values	No	
Hospital Name	Yes	
Department	Yes	
Character Set	Yes	Default ""
<b>DICOM Store AE Parameters</b>		
Storage SCU time-out waiting for a response to a C-STORE-RQ	No	?
Number of times a failed send job may be retried	No	3?
Delay between retrying failed jobs	No	1s?
Max.number of simultaneously initiated Associations by the Storage AE	No	1?
Post Processing	Yes	12bit image --> VOI Lut OD Rel
Supported Transfer Syntaxes	No	Implicit VR Little Endian
<b>DICOM Print AE Parameters</b>		
Print SCU time-out waiting for a response to a N-CREATE-RQ	No	?
Print SCU time-out waiting for a response to a N-SET-RQ	No	?
Print SCU time-out waiting for a response to a N-ACTION-RQ	No	?
Number of times a failed print-job may be retried	No	
Delay between retrying failed print-jobs	No	
Minimum density	Yes	0.2
Maximum density	Yes	3
Border density	Yes	3
Text background	Yes	0.2
Print ruler	Yes	Yes
Configuration information	Yes	PERCEPTION_LUT=LINEAR
Magnification type	Yes	Cubic
Rescale Type	Yes	OD
Viewbox Luminance	Yes	2000
Ambient Luminance	Yes	10
Supported Transfer Syntaxes	No	
<b>RISLINK AE Parameters</b>		
Modality Worklist SCU time-out waiting for the final response to a C-FIND-RQ	No	
Supported Transfer Syntaxes for Modality Worklist	No	Implicit VR Little Endian

## 3 MEDIA INTERCHANGE

### 3.1 Implementation Model

#### 3.1.1 Application Data Flow Diagram



**Figure 3.1-1: Application Data Flow Diagram for Media Storage**

- The DICOM Export Application Entity exports images to a CD-R Storage medium. It is associated with the “DICOM Export” that can be activated in IPD Selector for the selected studies

#### 3.1.2 Functional Definition of AEs

Activation of the “DICOM Export” menu entry will pass the currently selected studies to the DICOM Export AE. The SOP Instances associated with the selection will be collected and written to CD.

#### 3.1.3 Sequencing of Real World Activities

At least one image or presentation state must exist and be selected before the DICOM Export AE can be invoked. A blank CD-R should be inserted before invocation of the DICOM Export AE. If no CD-R media is available the export will be canceled.

#### 3.1.4 File Meta Information for Implementation Class and Version

The implementation information written to the File Meta Header in each file is:

- Implementation Class UID: 1.3.51.0.1.3
- Implementation Version Name: AGFA DTF1.0.87

### 3.2 AE Specifications

#### 3.2.1 DICOM Export AE Specification

The DICOM Export AE provides standard conformance to the DICOM Interchange Option of the Media Storage Service Class. The Applications and roles are listed below:

**Table 3.2-1: Application Profiles, Real World Activities and Roles for DICOM Export AE**

Supported Application Profile	Real-World Activity	Roles	SC Option
STD-GEN-CD	DICOM Export	FSC	Interchange

### 3.2.1.1 File Meta Information for the DICOM Export AE

This Source Application Entity title is omitted from the File Meta Header.

### 3.2.1.2 Real World Activities

#### 3.2.1.2.1 Real World Activity – DICOM Export to CD

The DICOM Export AE acts as an FSC using the interchange option when requested to export SOP Instances from the local database to a CD-R medium.

A blank CD needs to be inserted before starting the export, Writing in multi-session mode is not supported.

#### 3.2.1.2.1.1 Media Storage Application Profile

The STD-GEN-CD Application Profile is supported, the supported SOP Classes and Transfer Syntaxes are listed in the Table below:

**Table 3.2-2: IODs, SOP Classes and Transfer Syntaxes for DICOM Export AE**

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	Explicit VR Little Endian	1.2.840.10008.1.2.1

## 3.3 Media Configuration

The format in which the images are exported can be configured:

- 8-bit OD
- 8-bit P-Value
- 12-bit OD
- 12-bit P-Value
- 12-bit OD REL
- 12-bit VOI OD REL
- 15-bit VOI P-Value

## 4 SUPPORT FOR EXTENDED CHARACTER SETS

CR QS supports the following character sets:

• ISO-IR 6 (default)	Basic G0 Set
• 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 148	Latin Alphabet No. 5
• ISO-IR 144	Cyrillic
• ISO-IR 127	Arabic
• ISO-IR 126	Geek
• ISO-IR 138	Hebrew
• ISO 2022 IR 13 \ ISO 2022 IR 87	Japanese
• \ISO 2022 IR 159	Japanese
• \ISO 2022 IR 149	Korean
• GB18030	Chinese
• \ISO 2022 B5	Chinese
• \ISO 2022 GBK	Chinese
• ISO-IR 192	UTF-8

The configured character set will be used by all Application Entities.

## **5 SECURITY**

### **5.1 Security Profiles**

No security profiles are supported.

### **5.2 Association Level Security**

The CR QS will only accept associations from Devices with an AE title that has been configured in Config View. Other associations will be rejected.

The CR QS can be configured to use TLS (for authentication and data integrity) on its connections to a PACS system.

### **5.3 Application Level Security**

Application Level Security is achieved using Windows user accounts. The QS discerns 3 types of users, depending on the group (QSAdmins, QSServices and QSUsers) the user is member of.

## 6 ANNEXES

### 6.1 IOD Contents

#### 6.1.1 Created SOP Instance(s)

Table 6.1-2 specifies the attributes of a CR image transmitted by the DICOME Store AE

The following tables use a number of abbreviations. In the “Presence of...” column:

- VNAP Value Not Always Present (attribute sent zero length if no value is present)
- ANAP Attribute Not Always Present
- ALWAYS Always Present with a value

Abbreviations used in the source column are:

- USER the attribute value source is from User input
- AUTO the attribute value is generated automatically
- MWL, Modality Worklist the attribute value is the same as the value received using a DICOM Worklist
- CONFIG the attribute value source is a configurable parameter

**Table 6.1-1: IOD of Created CR Image SOP Instances**

IE	Module	Reference	Presence of Module
Patient	Patient	Table 6.1-2	Always
Study	General Study	Table 6.1-2	Always
	Patient Study	Table 6.1-2	Always
Series	General Series	Table 6.1-2	Always
	CR Series	Table 6.1-2	Always
Equipment	General Equipment	Table 6.1-2	Always
Image	General Image	Table 6.1-2	Always
	Image Pixel	Table 6.1-2	Always
	Contrast/bolus	Table 6.1-2	Always
	CR Image	Table 6.1-2	Always
	Modality LUT	Table 6.1-2	Always
	VOI LUT	Table 6.1-2	Always
	SOP Common	Table 6.1-2	Always
	Private Application	Table 6.1-2	Always
	Additional Attributes	Table 6.1-2	Always

**Table 6.1-2: IOD of Created CR Image SOP Instances**

Attribute Name	Tag	VR	Value	Presence of Value	Source
<b>Patient IE</b>					
Patient Module					
Patient's Name	(0010,0010)	PN		VNAP	USER or MWL
Patient ID	(0010,0020)	LO		ALWAYS	USER, MWL or AUTO
Patient's Birth Date	(0010,0030)	DA		ALWAYS	USER or MWL
Patient's Sex	(0010,0040)	CS		ALWAYS	USER or MWL
Other Patient IDs	(0010,1000)	LO		VNAP	MWL
Ethnic Group	(0010,2160)	SH		VNAP	MWL
Patient Comments	(0010,4000)	LT	(Limited to 64 characters)	VNAP	USER or MWL
<b>Study IE</b>					
General Study					
Study Instance UID	(0020,000D)	UI		ALWAYS	MWL or AUTO
Study Date	(0008,0020)	DA		ALWAYS	AUTO
Study Time	(0008,0030)	TM		ALWAYS	AUTO
Accession Number	(0008,0050)	SH		ALWAYS	USER, MWL or AUTO
Referring Physician's Name	(0008,0090)	PN		VNAP	MWL
Name of Physician(s) Reading Study	(0008,1060)	PN		VNAP	AUTO
Study ID	(0020,0010)	SH		VNAP	AUTO
Study Description	(0008,1030)	LO	Study type as selected in ID viewer	ALWAYS	AUTO
Patient Study					
Admitting Diagnoses Description	(0008,1080)	LO		VNAP	MWL
Patient's Size	(0010,1020)	DS		VNAP	MWL
Patient's Weight	(0010,1030)	DS		VNAP	MWL
Occupation	(0010,2180)	SH		VNAP	MWL
Additional Patient History	(0010,21B0)	LT		VNAP	MWL
<b>Series IE</b>					
General Series					
Modality	(0008, 0060)	CS	CR	ALWAYS	AUTO
Series Instance UID	(0020,000E)	UI		ALWAYS	AUTO
Series Number	(0020,0011)	IS		ALWAYS	AUTO

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient Position	(0018,5100)	CS		VNAP	?
Laterality	(0020,0060)	CS		VNAP	?
Series Description	(0008,103E)	LO	Concatenation of Substudy and exposure	ALWAYS	AUTO
Performing Physician's Name	(0008,1050)	PN		VNAP	AUTO
Operator's Name	(0008,1070)	PN		VNAP	AUTO
<b>CR Series Module</b>					
Body Part Examined	(0018,0015)	CS	Automatically filled in with the Body Part that was configured for the taken exposure in the exam tree. The list of body parts can be extended in the config view	VNAP	AUTO
View Position	(0018,5101)	CS	Automatically filled in with the View Position that was configured for the taken exposure in the exam tree. (AP, PA, LL, RL)	ALWAYS	AUTO
Filter Type	(0018,1160)	SH		VNAP	AUTO
Collimator/Grid Name	(0018,1180)	SH		VNAP	AUTO
Focal Spot	(0018,1190)	DS		VNAP	AUTO
Plate Type	(0018,1260)	SH		ALWAYS	AUTO
<b>Equipment</b>					
General Equipment Module					
Manufacturer	(0008,0070)	LO	AGFA	ALWAYS	FIXED
Institution Name	(0008,0080)	LO		ALWAYS	CONFIG
Station Name	(0008,1010)	SH		ALWAYS	AUTO
Institutional Department	(0008,1040)	LO		ALWAYS	CONFIG
Manufacturer's Model Name	(0008,1090)	LO		ALWAYS	AUTO
Device Serial Number	(0018,1000)	LO		ALWAYS	AUTO
Software Version	(0018,1020)	LO		ALWAYS	AUTO
<b>Image</b>					
General Image Module					
Instance Number	(0020,0013)	IS		ALWAYS	AUTO
Patient Orientation	(0020,0020)	CS		ALWAYS	AUTO
Image Comments	(0020,4000)	LT		ALWAYS	USER
Image Type	(0008,0008)	CS		ALWAYS	AUTO
Acquisition Date	(0008,0022)	DA		ALWAYS	AUTO
Acquisition Time	(0008,0032)	TM		ALWAYS	AUTO
Presentation LUT Shape	(2050,0020)	CS		ANAP	AUTO

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Pixel Module					
Samples per pixel	(0028,0002)	US	1	ALWAYS	AUTO
Rows	(0028,0010)	US		ALWAYS	AUTO
Columns	(0028,0011)	US		ALWAYS	AUTO
Pixel Aspect Ratio	(0028,0034)	IS	1 1	ALWAYS	AUTO
Bits allocated	(0028,0100)	US	8 or 16	ALWAYS	CONFIG
Bits Stored	(0028,0101)	US	8, 12 or 15	ALWAYS	CONFIG
High bit	(0028,0102)	US		ALWAYS	AUTO
Pixel Representation	(0028,0103)	US		ALWAYS	AUTO
Pixel Data	(7FE0,0010)	OW or OB		ALWAYS	AUTO
Contrast / Bolus Modules					
Contrast/Bolus Agent	(0018,0010)	LO		VNAP	AUTO
Contrast/Bolus Volume	(0018,1041)	DS		VNAP	AUTO
Contrast/Bolus Total Dose	(0018,1044)	DS		VNAP	AUTO
CR Image Module					
KVP	(0018,0060)	DS		VNAP	AUTO
Plate ID	(0018,1004)	LO		ALWAYS	AUTO
Exposure Time	(0018,1150)	IS		VNAP	AUTO
X-Ray Tube current	(0018,1151)	IS		VNAP	AUTO
Exposure in uAs	(0018,1153)	IS		VNAP	AUTO
Imager Pixel Spacing	(0018,1164)	DS		VNAP	AUTO
Acquisition Device Procession Code	(0018,1401)	LO		VNAP	AUTO
Cassette Orientation	(0018,1402)	CS		ALWAYS	AUTO
Cassette Size	(0018,1403)	CS		ALWAYS	AUTO
Exposures on Plate	(0018,1404)	US		ALWAYS	AUTO
Relative X-ray Exposure	(0018,1405)	IS	Is equal to Lgm value in (0019,1015) * 1000	ALWAYS	AUTO
Sensitivity	(0018,6000)	DS		ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS		ALWAYS	AUTO
Modality LUT Module					
Rescale Intercept	(0028,1052)	DS		VNAP	AUTO
Rescale Slope	(0028,1053)	DS		VNAP	AUTO
Rescale Type	(0028,1054)	LO	OD, OD REL, LOG_E REL, P, P REL	VNAP	AUTO
VOI LUT Module (See note)					

Attribute Name	Tag	VR	Value	Presence of Value	Source
Window Width	(0028,1051)	DS		ANAP	AUTO
Window Center	(0028,1050)	DS		ANAP	AUTO
VOI LUT Sequence	(0028,3010)	DS		ANAP	AUTO
>Lut Descriptor	(0028,3002)	US		ANAP	AUTO
>Lut Data	(0028,3006)	US		ANAP	AUTO
>Lut Explanation	(0028,3003)	LO		ANAP	AUTO
<b>SOP Common Module</b>					
Specific Character Set	(0008,0005)	DS		ANAP	CONFIG
SOP Class UID	(0008,0016)	UI		ALWAYS	AUTO
SOP Instance UID	(0008,0018)	UI		ALWAYS	AUTO
Instance Creation Date	(0008,0012)	DA		ALWAYS	AUTO
Instance Creation Time	(0008,0013)	TM		ALWAYS	AUTO
<b>Additional Attributes</b>					
Medical Alerts	(0010,2000)	LO		VNAP	MWL
Contrast Allergies	(0010,2110)	LO		VNAP	MWL
Estimated Radiographic Magnification Factor	(0018,1114)	DS		VNAP	AUTO
Grid	(0018,1166)	CS		VNAP	AUTO
Anode Target Material	(0018,1191)	CS		VNAP	AUTO
Body Part Thickness	(0018,11A0)	DS		VNAP	AUTO
Compression Force	(0018,11A2)	DS		VNAP	AUTO
Positioner Primary Angle	(0018,1510)	DS		VNAP	AUTO
Filter Material	(0018,7050)	CS		VNAP	AUTO
Exposure Control Mode	(0018,7060)	CS		VNAP	AUTO
Exposure Control Mode Description	(0018,7062)	LT		VANP	AUTO
Phototimer Setting	(0018,7065)	DS		VNAP	AUTO
Pixel Spacing	(0028,0030)	DS		VNAP	AUTO
Special Needs	(0038,0050)	LO		VNAP	AUTO
Current Patient Location	(0038,0300)	LO		VNAP	AUTO
Confidentiality Constraint on Patient Data Description	(0040,3001)	LO		VNAP	AUTO

Attribute Name	Tag	VR	Value	Presence of Value	Source
Entrance Dose in mGy	(0040,8302)	DS		VNAP	AUTO
Polarity	(2020,0020)	CS		VNAP	AUTO
Source Number	(300A,0212)	IS		VNAP	AUTO
Source Type	(300A,0214)	CS		VNAP	AUTO
Approval status	(300E,0002)	CS		VNAP	AUTO
<b>Private Attributes</b>					
Private Creator	(0019,00FF)	SH	AGFA	ALWAYS	AUTO
Image processing parameters	(0019,FF10)	ST		ALWAYS	AUTO
Identification Data	(0019,FF11)	LO		ALWAYS	AUTO
Sensometry Name	(0019,FF13)	LO		VNAP	AUTO
Dose monitoring (Lgm)	(0019,FF15)	LO		VNAP	AUTO
Clipped Exposure Deviation	(0019,FF1A)	LO		VNAP	AUTO
Logarithmic PLT Full Scale	(0019,FF1B)	LO		VNAP	AUTO
Nr of series	(0019,FF60)	US		ALWAYS	AUTO
ID station name	(0019,FF62)	SH		VNAP	AUTO
Number of Images in Study to be transmitted. Only send if autoverify is on	(0019,FF65)	US		VNAP	AUTO
Nr of images	(0019,FF70)	US		VNAP	AUTO
Geometrical Transformations	(0019,FF80)	SH		VNAP	AUTO
Roam Origin	(0019,FF81)	ST		VNAP	AUTO
Zoom factor	(0019,FF82)	US		VNAP	AUTO
Status	(0019,FF93)	CS		VNAP	AUTO
XRay Equipment Type	(0019,FF98)	LO		VNAP	AUTO

**Table 6.1-3: Supported post processing**

	PI	M-Lut Rescale			VOI-Lut			P-LUT
	(1)	Intercept	Slope	Type	Explanation	WinCenter	WinWidth	LUT-Shape
Description	28,0004	28.1052	28.1053	28.1054	28.3003	28,1050	28.1051	2050,0020
8-bit OD	M1	200	10.9804	OD	-	1600	2800	-
8-bit ODGAMMA	M1	200	10.9804	OD	-	1600	2800	-
8-bit P-Value	M1	0.0	1.0	P-VALUES	-	128	256	INVERSE
12-bit OD	M1	200	0.684	OD	-	1600	2800	-
12-bit ODGAMMA	M1	200	0.684	OD	-	1600	2800	-
12-bit P-Value	M1	0.0	1.0	P-VALUES	-	2048	4096	INVERSE
12-bit OD REL	M1	0.0	1.0	OD REL	-	2048	4096	-
12-bit Image --> VOI Lut OD REL (12)	M1	0.0	1.0	LOG_E REL	E25, NK5. ...	-	-	-
12-bit image --> VOI Lut ODGamma (12)	M1	0.0	1.0	LOG_E REL	E25, NK5. ...	-	-	-
15-bit Image --> VOI Lut P-Value (15)	M1	0.0	1.0	P-VALUES	E25, NK5. ...	-	-	INVERSE

**Note VOI LUT:**

Depending on the configuration either a VOI LUT Sequence or Window Width/Center is sent.

**6.1.2 Attribute Mapping****Table 6.1-4: Attribute Mapping Between Modality Worklist and Image**

Modality Worklist	Image IOD
Accession Number	Accession Number
Patient Name	Patient Name
Patient Birth Date	Patient Birth Date
Patient ID	Patient ID
Other Patient Other Ids	Other Patient Other Ids
Patient Sex	Patient's Sex
Ethnic Group	Ethnic Group
Occupation	Occupation
Patient's Size	Patient's Size
Patient's Weight	Patient's Weight
Patient Comments	Patient Comments
Additional Patient History	Additional Patient History
Current Patient Location	Current Patient Location
Admitting Diagnoses Description	Admitting Diagnoses Description
Contrast Allergies	Contrast Allergies
Medical Alerts	Medical Alerts
Special Needs	Special Needs

Modality Worklist	Image IOD
Study Instance UID	Study Instance UID
Referring Physician's Name	Referring Physician's Name
Confidentiality Constraint on Patient Data Description	Confidentiality Constraint on Patient Data Description

### 6.1.3 Coerced/ Modified Fields

Patient data coming from the RIS is not editable. But under some circumstances CR QS will modify some attributes, as listed in the table below.

**Table 6.1-5: Coerced Fields for CR Image SOP Class**

Attribute Name	Tag	Coercion Conditions
Patient ID	(0010,0020)	If the Patient ID does not contain digits
Accession Number	(0008,0050)	If no accession number is provided, one will be generated

## 6.2 Data Dictionary of Private Attributes

The Private Attributes used in created SOP Instances are listed in the Table below. CR QS reserves blocks of private attributes in the group 0019.

**Table 6.2-1: Data Dictionary Of Private Attributes**

Tag	Attribute Name	VR	VM
(0019,0010)	Private Identification Code (Fixed AGFA)	SH	
(0019,1010)	Image processing parameters (See Note )	ST	
(0019,1011)	Identification data	LO	
(0019,1013)	Sensitometry name	LO	
(0019,1015)	Dose monitoring value	LO	
(0019,101A)	Clipped exposure deviation	LO	
(0019,101B)	Logarithmic plt_full_scale	LO	
(0019,1060)	Total Number of series	US	
(0019,1062)	ID Station Name	SH	
(0019,1065)	Number of Images in Study to be transmitted	US	
(0019,1070)	Total Number Of Images	US	
(0019,1080)	Geometrical Transformations	ST	
(0019,1081)	Roam origin	ST	
(0019,1082)	Zoom factor	US	
(0019,1093)	Status	CS	
(0019,1098)	X-Ray equipment type	LO	

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## Notes

Has the form "MENU=menu CC=cc EC=ec LR=lr NR=nr" where:

menu: an integer specifying the image processing number  
cc: an integer specifying the collimation configuration  
mc: a real number specifying the Musica contrast  
ec: a real number specifying the edge contrast  
lr: a real number specifying the latitude reduction  
nr: a real number specifying the noise reduction

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### 6.3 Coded Terminology and Templates

The modality has no specific support for Coded Terminology.

It is however possible in ID Viewer to map data from an arbitrary DICOM field to the exam tree, in order to enable automatic study selection based on data coming from the RIS.

### 6.4 Grayscale Image Consistency

The CR QS can be configured to output P Values to the display when a display monitor is attached that supports calibration to the Grayscale Standard Display Function (GSDF)

### 6.5 Standard Extended / Specialized / Private SOPs

No Specialized or Private SOP Classes are supported

#### 6.5.1 Standard Extended CR Image Storage SOP

The CR Image Storage SOP Class is extended to create a Standard Extended SOP Class by addition of standard and private attributes as documented above.

### 6.6 Private Transfer Syntaxes

No Private Transfer Syntaxes are supported



## **This document was approved by:**

### **Signatures:**

1. Bruno Laffin on 2007/03/06 7:01:10 PM GMT+1

Approval Completion Date: 2007/03/08 2:22:46 PM GMT+1

Document ID/Node ID: 9970858

Source Version: 5

PDF Version: 6

### **Applied Categories and Attributes:**