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DRF4343 / juno I / HirisRf43
Network and Media Interchange
DICOM Conformance Statement

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DOCUMENT HISTORY

V1.0   First release of this document. It claims conformace to *Verification SCP/SCU, Storage CR/DX/XA/RF SCU, Storage Commitment SCU, Basic Grayscale Print SCU, Modality Worklist SCU, MPPS SCU, Dicom Media FSC* services.

V1.1   Added conformance to *Query/Retrieve SCU* service.

V1.1.1   Added item tag (0018,1405) to IOD of *Storage CR/DX/XA/RF.*

V1.1.2   Added item tags (0008,1110), (0040,0244), (0040,0245), (0032,1060), (0040,0007), (0040,0008), (0040,0009) to IOD of *Storage CR/DX.*
Added item tags (0008,1110), (0032,1060), (0040,0007), (0040,0008), (0040,0009) to IOD of *Storage CR/DX/XA/RF.*
Changed tags (0008,0050), (0040,1001) from return keys to matching keys in *Worklist* service. Added tags (0008,1110), (0008,0090) as return keys to *Worklist* service.
Added tag (0008,1110) to IOD of *MPPS* service.
Changed SCP AE title selection mode in *Storage Commitment SCU* service.

V1.1.3   Added support to specific character set.

V1.1.4   Added support to transfer syntax *Explicit Little Endian* to service *Storage CR/DX/XA/RF.*
Added support to transfer syntax *Implicit Little Endian* to service *Storage XA/RF.*

V1.1.5   Minor changes and fixes.

NETWORK CONFORMANCE STATEMENT

0   NETWORK: INTRODUCTION

Digitec HirisRf43 is a computed radiography modality device capable to acquire up to 2880x2880 pixels images and to manage up to 16Kx16K pixels reconstructed images.

Digitec HirisRf43 is equipped with a *Hiris Network Data Interface* (HNDI) that allows the transfer of images according with DICOM 3.0 standard.

This document describes the conformance of HNDI to DICOM 3.0 standard.

1   IMPLEMENTATION MODEL

HNDI is an application capable to verify application level communication between two DICOM 3.0 peers as well as to store and print images on remote DICOM interfaced archives an printers. HNDI can manage worklist received from HIS/RIS and acts a a SCU for storage commitment and MPPS Dicom services. HNDI can find and retrieve studies stored remotely.

1.1   Application data flow diagram

A dedicated menu commands starts communication DICOM services to peer selected in the remote DICOM applications list. See figure 1.1-1.
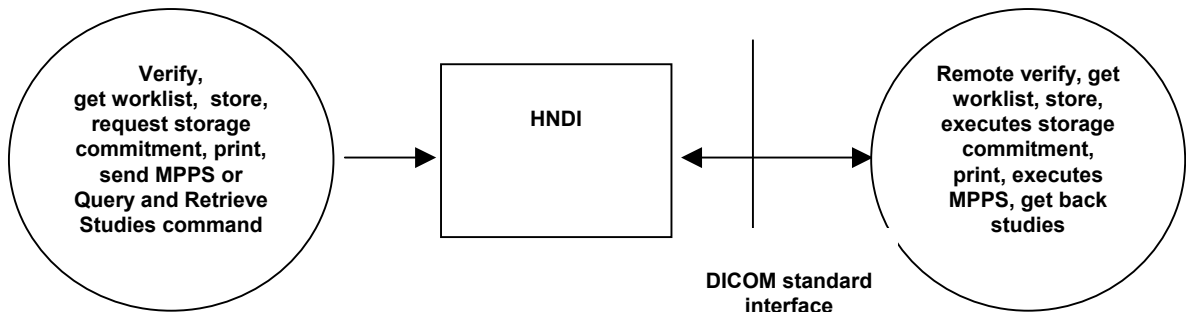
Figure 1.1-1 HNDI Implementation Model

1.2   Functional definitions of AE's

When HNDI is invoked, it starts an association to the destination AE with an opportune Presentation Context to verify the communication, to get worklist, to store/print an image, to request storage commitment, to notify an MPPS and to find and retrieve remote stored studies. It returns the command exit status to be displayed on the main monitor (depending on status return code).

1.3   Sequencing of real-world activities

Not applicable.

2   AE SPECIFICATION

HNDI is configured as a single application.

HNDI provides Standard Conformance to the following DICOM V3.0 SOP Class as a SCU:

SOP Class Name	SOP Class UID
Verification SOP Class	1.2.840.10008.1.1
Computed Radiography Storage SOP Class	1.2.840.10008.5.1.4.1.1.1
Digital X-Ray Image Storage – For Presentation SOP Class	1.2.840.10008.5.1.4.1.1.1.1
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2
Storage Commitment Service Class	1.2.840.10008.1.20.1
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3
Patient Root Query/Retrieve Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2
Study Root Query/Retrieve Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2

HNDI provides Standard Conformance to the following DICOM V3.0 SOP Class as a SCP:

SOP Class Name	SOP Class UID
Verification SOP Class	1.2.840.10008.1.1
Computed Radiography Storage SOP Class	1.2.840.10008.5.1.4.1.1.1
Digital X-Ray Image Storage – For Presentation SOP Class	1.2.840.10008.5.1.4.1.1.1.1
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2

2.1 HNDI specification

2.1.1 Association establishment policy

2.1.1.1 General

HNDI tries to establish an association whenever is invoked by with a valid "destination" field. The list of "destination" known by the system is configurable. The maximum PDU size that will be negotiated is 60KB.

2.1.1.2 Number of associations

Only one association a time is allowed.

2.1.1.3 Asynchronous nature

No asynchronous operations window negotiation will be performed.

2.1.1.4 Implementation identifying information

HNDI supplies the Implementation Class UID 1.3.76.6.1.1.5.1.1. The version name provided is "DIGITEC V5.0".

2.1.2 Association initiation by real-world activity

2.1.2.1 Communication verification

2.1.2.1.1 Associated real-world activity

The request to verify DICOM communication starts an association negotiation.

2.1.2.1.2 Proposed presentation contexts

A single Presentation Context is offered for an association, with Abstract Syntax related to the "Verification SOP Class" and Transfer Syntax "Implicit VR Little Indian". No extended negotiation is performed. Default SCU role is assumed. See table 2.1.2.1.2-1.

Table 2.1.2.1.2-1 Proposed presentation context for HNDI Verification

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Verification SOP Class	1.2.840.10008.1.1	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None

2.1.2.1.2.1 SOP specific conformance statement for Verification SOP Class

Standard Conformance is provided to the Verification SOP Class (1.2.840.10008.1.1) of the DICOM Image Storage Service Class. No attribute is associated with C-ECHO service.

HNDI accepts status codes from C-ECHO service and performs actions as in the following list:

- 0000H Success. The writing *"<Aetitle> verification OK"* is displayed and the association is closed.

2.1.2.2 Transfer of a still image – Computer Radiography Image Storage

2.1.2.2.1 Associated real-world activity

If HirisRf43 is configured to use the CR Storage service, the request to transfer a CR still image starts an association negotiation for the *CR Storage Service*.

2.1.2.2.2 Proposed presentation contexts

A single Presentation Context is offered for an association, with Abstract Syntax related to the "Computed Radiography Image Storage" and Transfer Syntax "Implicit VR Little Indian". No extended negotiation is performed. Default SCU role is assumed. See table 2.1.2.2.2-1.

Table 2.1.2.2.2-1 Proposed presentation contex for HNDI CR-Storage

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		

2.1.2.2.2.1 SOP specific conformance statement for CR Image Storage SOP Class

Standard Conformance is provided to the Computed Radiography Image Storage SOP Class (1.2.840.10008.5.1.4.1.1.1) of the DICOM Image Storage Service Class.

The supported attributes of the associated CR image IOD are listed in the table 2.1.2.2.2.1-1. All type 1 attributes will be sent with a length different from zero; all type 2 attributes listed in the table will be sent, possibly with a length of zero. All type 3 attributes may or may not be transmitted, possibly with a length of 0, depending on the parameters passed to HNDI by the application requesting the service.

Table 2.1.2.2.2.1-1 CR Image IOD

Group	Element	Attribute Description	Type	Note
0008	0005	Specific character set	1C	
0008	0008	Image Type	3	
0008	0016	SOP Class UID	1	
0008	0018	SOP Instance UID	1	
0008	0020	Study Date	2	

0008	0021	Series Date	3	
0008	0022	Acquisition Date	3	
0008	0023	Content Date	2C	
0008	0030	Study Time	2	
0008	0031	Series Time	3	
0008	0032	Acquisition Time	3	
0008	0033	Content Time	2C	
0008	0050	Accession Number	2	
0008	0060	Modality	1	Fixed "CR"
0008	0070	Manufacturer	2	
0008	0080	Institution Name	3	
0008	0081	Institution Address	3	
0008	0090	Referring Physician's Name	2	
0008	1010	Station Name	3	
0008	1030	Study Description	3	
0008	1032	Procedure Code Sequence	3	
> *Include "Code Sequence Macro"*				
0008	103E	Series Description	3	
0008	1050	Performing Physicians' Name	3	
0008	1090	Manufacturer's Model Name	3	
0008	1110	Referenced Study Sequence	3	
0008	1150	>Referenced SOP Class UID	1C	
0008	1155	>Referenced SOP Instance UID	1C	
0008	1111	Referenced Performed Procedure Step Sequence	3	
0008	1150	>Referenced SOP Class UID	1C	
0008	1155	>Referenced SOP Instance UID	1C	
0008	2112	Source Image Sequence	3	
0008	1150	>Referenced SOP Class UID	1C	
0008	1155	>Referenced SOP Instance UID	1C	
0010	0010	Patient's Name	2	
0010	0020	Patient's ID	2	
0010	0030	Patient's Birth Date	2	
0010	0040	Patient's Sex	2	
0010	1000	Other Patient ID	3	
0010	1020	Patient's Size	3	
0010	1030	Patient's Weight	3	
0010	1040	Patient's Address	3	
0010	2154	Patient's Telephone Numbers	3	
0010	2160	Ethnic Group	3	
0010	2180	Patient's Occupation	3	

0010	4000	Patient Comments	3	
0018	0015	Body Part Examined	2	
0018	0025	Angio Flag	3	
0018	0060	KVP	3	
0018	1000	Device Serial Number	3	
0018	1020	Software Version	3	
0018	1030	Protocol Name	3	
0018	1110	Distance Source to Detector	3	
0018	1111	Distance Source to Patient	3	
0018	1150	Exposure Time	3	
0018	1151	X-Ray Tube Current	3	
0018	1152	Exposure	3	
0018	1153	Exposure in uAs	3	
0018	115E	Image Area Dose Product	3	
0018	1164	Imager Pixel Spacing	3	
0018	1405	Relative X-Ray Exposure	3	
0018	5101	View Position	2	
0018	8150	Exposure Time in us	3	
0018	8151	X-Ray Tube Current in uA	3	
0020	000D	Study Instance UID	1	
0020	000E	Series Instance UID	1	
0020	0010	Study ID	2	
0020	0011	Series Number	2	
0020	0013	Instance Number	2	
0020	0020	Patient Orientation	2C	
0020	0060	Laterality	2C	
0028	0002	Samples per Pixel	1	Fixed: "1"
0028	0004	Photometric Interpretation	1	Fixed: "MONOCHROME2"
0028	0010	Rows	1	
0028	0011	Columns	1	
0028	0030	Pixel Spacing	3	
0028	0034	Pixel Aspect Ratio	1C	
0028	0100	Bits Allocated	1	8,16 (Configurable)
0028	0101	Bits Stored	1	8,10,12,14,16 (Configurable)
0028	0102	High Bit	1	Bits Stored –1
0028	0103	Pixel Representation	1	Fixed: "0"
0028	0301	Burned In Annotation	3	
0040	0244	Performed Procedure Step Start Date	3	
0040	0245	Performed Procedure Step Start Time	3	
0040	0253	Performed Procedure Step ID	3	

0040	0254	Performed Procedure Step Description	3	
0040	0260	Performed Protocol Code Sequence	3	
> Include "Code Sequence Macro"				
0040	0275	Request Attribute Sequence	3	
0032	1060	> Requested Procedure Description	3	
0040	0007	> Scheduled Procedure Step Description	3	
0040	0008	> Scheduled Protocol Code Sequence	3	
>> Include "Code Sequence Macro"				
0040	0009	> Scheduled Procedure Step ID	3	
0040	1001	> Requested Procedure ID	1C	
0050	0004	Calibration Image	3	
7FE0	0010	Pixel Data	1	

HNDI accepts status codes from C-STORE service and performs actions as in the following list:

- 0000H   Success. The writing *"Transfer complete"* is displayed and the association is closed.

- 0100H to 0212H. Error. The writing *"Error xxx"* is displayed and the association is closed.

- 0213H Resource limitation. The writing *"Failure: resource limitation"* is displayed and the association is closed.

- A7xxH Out of resources. The writing *"SCP out of resources"* is displayed and the association is closed.

- CxxxH Cannot understand. The writing *"Failure: error Cxxx"* is displayed and the association is closed.

- BxxxH Warning. The writing *"Warning: error Bxxx"* is displayed and the association is closed.

2.1.2.3   Transfer of a still image – Digital X-Ray Image Storage For Presentation

2.1.2.3.1   Associated real-world activity

If HirisRf43 is configured to use the DX Storage service, the request to transfer a DX still image starts an association negotiation for the *DX Storage Service*.

2.1.2.3.2   Proposed presentation contexts

A single Presentation Context is offered for an association, with Abstract Syntax related to the "Digital X-Ray Image Storage – For Presentation" and Transfer Syntax "Implicit VR Little Endian". No extended negotiation is performed. Default SCU role is assumed. See table 2.1.2.3.2-1.

Table 2.1.2.3.2-1 Proposed presentation contex for HNDI DX-Storage

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name**	**UID**		
Digital X-Ray Image Storage – For Presentation SOP Class	1.2.840.10008.5.1.4.1.1.1.1	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		

2.1.2.3.2.1 SOP specific conformance statement for DX Image Storage SOP Class

Standard Conformance is provided to the Digital X-Ray Image Storage – For Presentation SOP Class (1.2.840.10008.5.1.4.1.1.1.1) of the DICOM Image Storage Service Class.

The supported attributes of the associated DX image IOD are listed in the table 2.1.2.3.2.1-1. All type 1 attributes will be sent with a length different from zero; all type 2 attributes listed in the table will be sent, possibly with a length of zero. All type 3 attributes may or may not be transmitted, possibly with a length of 0, depending on the parameters passed to HNDI by the application requesting the service.

Table 2.1.2.3.2.1-1 DX Image IOD

Group	Element	Attribute Description	Type	Note
0008	0005	Specific character set	1C	
0008	0008	Image Type	1	
0008	0016	SOP Class UID	1	
0008	0018	SOP Instance UID	1	
0008	0020	Study Date	2	
0008	0021	Series Date	3	
0008	0022	Acquisition Date	3	
0008	0023	Content Date	2C	
0008	0030	Study Time	2	
0008	0031	Series Time	3	
0008	0032	Acquisition Time	3	
0008	0033	Content Time	2C	
0008	0050	Accession Number	2	
0008	0060	Modality	1	Fixed "DX"
0008	0068	Presentation Intent Type	1	Fixed: "FOR PRESENTATION"
0008	0070	Manufacturer	2	
0008	0080	Institution Name	3	
0008	0081	Institution Address	3	
0008	0090	Referring Physician's Name	2	
0008	1010	Station Name	3	
0008	1030	Study Description	3	

0008	1032	Procedure Code Sequence	3	
> *Include "Code Sequence Macro"*				
0008	103E	Series Description	3	
0008	1050	Performing Physicians' Name	3	
0008	1090	Manufacturer's Model Name	3	
0008	1110	Referenced Study Sequence	3	
0008	1150	>Referenced SOP Class UID	1C	
0008	1155	>Referenced SOP Instance UID	1C	
0008	1111	Referenced Performed Procedure Step Sequence	3	
0008	1150	>Referenced SOP Class UID	1C	
0008	1155	>Referenced SOP Instance UID	1C	
0008	2112	Source Image Sequence	3	
0008	1150	>Referenced SOP Class UID	1C	
0008	1155	>Referenced SOP Instance UID	1C	
0008	2218	Anatomic Region Sequence	2	Always sent empty
0010	0010	Patient's Name	2	
0010	0020	Patient's ID	2	
0010	0030	Patient's Birth Date	2	
0010	0040	Patient's Sex	2	
0010	1000	Other Patient ID	3	
0010	1020	Patient's Size	3	
0010	1030	Patient's Weight	3	
0010	1040	Patient's Address	3	
0010	2154	Patient's Telephone Numbers	3	
0010	2160	Ethnic Group	3	
0010	2180	Patient's Occupation	3	
0010	4000	Patient Comments	3	
0018	0010	Contrast/Bolus Agent	2	
0018	0015	Body Part Examined	3	
0018	0060	KVP	3	
0018	1000	Device Serial Number	3	
0018	1020	Software Version	3	
0018	1030	Protocol Name	3	
0018	1150	Exposure Time	3	
0018	1151	X-Ray Tube Current	3	
0018	1152	Exposure	3	
0018	1153	Exposure in uAs	3	
0018	115E	Image Area Dose Product	3	
0018	1164	Imager Pixel Spacing	1	
0018	1405	Relative X-Ray Exposure	3	

0018	1460	Tomo Layer Height	1C	
0018	1470	Tomo Angle	1C	
0018	1480	Tomo Time	1C	
0018	7004	Detector Type	2	
0018	7005	Detector Configuration	3	
0018	8150	Exposure Time in us	3	
0018	8151	X-Ray Tube Current in uA	3	
0020	000D	Study Instance UID	1	
0020	000E	Series Instance UID	1	
0020	0010	Study ID	2	
0020	0011	Series Number	2	
0020	0013	Instance Number	2	
0020	0020	Patient Orientation	1	
0020	0062	Image Laterality	1	
0028	0002	Samples per Pixel	1	Fixed: "1"
0028	0004	Photometric Interpretation	1	
0028	0010	Rows	1	
0028	0011	Columns	1	
0028	0030	Pixel Spacing	3	
0028	0034	Pixel Aspect Ratio	1C	
0028	0100	Bits Allocated	1	
0028	0101	Bits Stored	1	
0028	0102	High Bit	1	
0028	0103	Pixel Representation	1	Fixed: "0"
0028	0301	Burned In Annotation	1	
0028	1040	Pixel Intensity Relationship	1	
0028	1041	Pixel Intensity Relationship Sign	1	
0028	1050	Window Center	1C	
0028	1051	Window Width	1C	
0028	1052	Rescale Intercept	1	
0028	1053	Rescale Slope	1	
0028	1054	Rescale Type	1	
0028	2110	Lossy Image Compression	1	
0028	3010	VOI LUT Sequence	1C	
0028	3002	>LUT Descriptor	1C	
0028	3006	>LUT Data	1C	
0040	0244	Performed Procedure Step Start Date	3	
0040	0245	Performed Procedure Step Start Time	3	
0040	0253	Performed Procedure Step ID	3	
0040	0254	Performed Procedure Step Description	3	

0040	0260	Performed Protocol Code Sequence	3	
> Include "Code Sequence Macro"				
0040	0275	Request Attribute Sequence	3	
0032	1060	> Requested Procedure Description	3	
0040	0007	> Scheduled Procedure Step Description	3	
0040	0008	> Scheduled Protocol Code Sequence	3	
>> Include "Code Sequence Macro"				
0040	0009	> Scheduled Procedure Step ID	3	
0040	1001	> Requested Procedure ID	1C	
0040	0555	Acquisition Context Sequence	2	Always sent empty
0050	0004	Calibration Image	3	
2050	0020	Presentation LUT Shape	1	
7FE0	0010	Pixel Data	1	

HNDI accepts status codes from C-STORE service and performs actions as in the following list:

- 0000H   Success. The writing *"Transfer complete"* is displayed and the association is closed.

- 0100H to 0212H. Error. The writing *"Error xxx"* is displayed and the association is closed.

- 0213H Resource limitation. The writing *"Failure: resource limitation"* is displayed and the association is closed.

- A7xxH Out of resources. The writing *"SCP out of resources"* is displayed and the association is closed.

- CxxxH Cannot understand. The writing *"Failure: error Cxxx"* is displayed and the association is closed.

- BxxxH Warning. The writing *"Warning: error Bxxx"* is displayed and the association is closed.

2.1.2.4   Transfer of a still image – X-Ray Angiographic Image Storage

2.1.2.4.1   Associated real-world activity

The request to transfer a XA still multiframe image starts an association negotiation for the *X-Ray Angiographic Storage Service.*

2.1.2.4.2   Proposed presentation contexts

A single Presentation Context is offered for an association, with Abstract Syntax related to the "X-Ray Amgiographic Image Storage" and Transfer Syntax "JPEG Lossless, Non-Hierarchical, First-Order Prediction, Process 14, Selection Value 1". No extended negotiation is performed. Default SCU role is assumed. See table 2.1.2.4.2-1.

Table 2.1.2.4.2-1 Proposed presentation contex for HNDI XA-Storage

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name**	**UID**		
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Jpeg Lossless non-hirarchical,First -order Prediction P14 Transfer Syntax	1.2.840.10008.1.2.4.70	SCU	None
		DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2		
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		

2.1.2.4.2.1 SOP specific conformance statement for XA Image Storage SOP Class

Standard Conformance is provided to the X-Ray Angiographic Image Storage SOP Class (1.2.840.10008.5.1.4.1.1.12.1) of the DICOM Image Storage Service Class.

The supported attributes of the associated XA image IOD are listed in the table 2.1.2.4.2.1-1. All type 1 attributes will be sent with a length different from zero; all type 2 attributes listed in the table will be sent, possibly with a length of zero. All type 3 attributes may or may not be transmitted, possibly with a length of 0, depending on the parameters passed to HNDI by the application requesting the service.

Table 2.1.2.4.2.1-1 XA Image IOD

Group	Element	Attribute Description	Type	Note
0008	0005	Specific character set	1C	
0008	0008	Image Type	1	
0008	0016	SOP Class UID	1	
0008	0018	SOP Instance UID	1	
0008	0020	Study Date	2	
0008	0021	Series Date	3	
0008	0022	Acquisition Date	3	
0008	0023	Content Date	3	
0008	002A	Acquisition Datetime	3	
0008	0030	Study Time	2	
0008	0031	Series Time	3	
0008	0032	Acquisition Time	3	
0008	0033	Content Time	3	
0008	0050	Accession Number	2	
0008	0060	Modality	1	Fixed "XA"
0008	0070	Manufacturer	2	
0008	0080	Institution Name	3	

0008	0081	Institution Address	3	
0008	0090	Referring Physician's Name	2	
0008	1010	Station Name	3	
0008	1030	Study Description	3	
0008	1032	Procedure Code Sequence	3	
> *Include "Code Sequence Macro"*				
0008	103E	Series Description	3	
0008	1050	Performing Physicians' Name	3	
0008	1070	Operator's Name	3	
0008	1090	Manufacturer's Model Name	3	
0008	1110	Referenced Study Sequence	3	
0008	1150	>Referenced SOP Class UID	1C	
0008	1155	>Referenced SOP Instance UID	1C	
0008	1111	Referenced Performed Procedure Step Sequence	3	
0008	1150	>Referenced SOP Class UID	1C	
0008	1155	>Referenced SOP Instance UID	1C	
0008	2112	Source Image Sequence	3	
0008	1150	>Referenced SOP Class UID	1C	
0008	1155	>Referenced SOP Instance UID	1C	
0010	0010	Patient's Name	2	
0010	0020	Patient's ID	2	
0010	0030	Patient's Birth Date	2	
0010	0040	Patient's Sex	2	
0010	1000	Other Patient ID	3	
0010	1020	Patient's Size	3	
0010	1030	Patient's Weight	3	
0010	1040	Patient's Address	3	
0010	2154	Patient's Telephone Numbers	3	
0010	2160	Ethnic Group	3	
0010	2180	Patient Occupation	3	
0010	4000	Patient Comments	3	
0018	0010	Contrast/Bolus Agent	2	
0018	0015	Body Part Examined	3	
0018	0040	Cine Rate	3	
0018	0060	KVP	2	
0018	1000	Device Serial Number	3	
0018	1020	Software Version	3	
0018	1030	Protocol Name	3	
0018	1065	Frame Time Vector	1	
0018	1110	Distance Source to Detector	3	

0018	1111	Distance Source to Patient	3	
0018	1114	Estimated Radiogr. Magnif. Factor	3	
0018	1147	Field of View Shape	3	
0018	1149	Field of View Dimension(s)	3	
0018	1150	Exposure Time	2	
0018	1151	X-Ray Tube Current	2	
0018	1152	Exposure	2C	
0018	1153	Exposure in uAs	3	
0018	1155	Radiation Setting	1	
0018	115A	Radiation Mode	3	
0018	115E	Image Area Dose Product	3	
0018	1164	Imager Pixel Spacing	1	
0018	1166	Grid	3	
0018	1405	Relative X-Ray Exposure	3	
0018	1500	Positioner Motion	2C	
0018	1510	Positioner Primary Angle	2	
0018	1511	Positioner Secondary Angle	2	
0018	1520	Positioner Primary Angle Increment	2C	
0018	1521	Positioner Secondary Angle Increment	2C	
0018	6000	Sensitivity	3	
0018	7004	Detector Type	3	
0018	7005	Detector Configuration	3	
0018	7011	Detector Binning	3	
0018	7024	Detecotr Active Shape	3	
0018	7026	Detector Dimension(s)	3	
0018	702A	Detector Manufacturer's Name	3	
0018	702B	Detector Manufacturer's Model Name	3	
0018	8150	Exposure Time in us	3	
0018	8151	X-Ray Tube Current in uA	3	
0020	000D	Study Instance UID	1	
0020	000E	Series Instance UID	1	
0020	0010	Study ID	2	
0020	0011	Series Number	2	
0020	0013	Instance Number	2	
0020	0020	Patient Orientation	2	
0020	0062	Image Laterality	1	
0028	0002	Samples per Pixel	1	Fixed: "1"
0028	0004	Photometric Interpretation	1	Fixed: "MONOCHROME2"
0028	0008	Number of Frames	1	
0028	0009	Frame Increment Pointer	1	

0028	0010	Rows	1	
0028	0011	Columns	1	
0028	0030	Pixel Spacing	3	
0028	0034	Pixel Aspect Ratio	1C	
0028	0100	Bits Allocated	1	
0028	0101	Bits Stored	1	
0028	0102	High Bit	1	
0028	0103	Pixel Representation	1	Fixed: "0"
0028	0300	Quality Control Image	3	
0028	0301	Burned In Annotation	3	
0028	1040	Pixel Intensity Relationship	1	
0028	2110	Lossy Image Compression	1	
0040	0244	Performed Procedure Step Start Date	3	
0040	0245	Performed Procedure Step Start Time	3	
0040	0253	Performed Procedure Step ID	3	
0040	0254	Performed Procedure Step Description	3	
0040	0260	Performed Protocol Code Sequence	3	
> Include "Code Sequence Macro"				
0040	0275	Request Attribute Sequence	3	
0032	1060	> Requested Procedure Description	3	
0040	0007	> Scheduled Procedure Step Description	3	
0040	0008	> Scheduled Protocol Code Sequence	3	
>> Include "Code Sequence Macro"				
0040	0009	> Scheduled Procedure Step ID	3	
0040	1001	> Requested Procedure ID	1C	
0050	0004	Calibration Image	3	
7FE0	0010	Pixel Data	1	

HNDI accepts status codes from C-STORE service and performs actions as in the following list:

- 0000H   Success. The writing *"Transfer complete"* is displayed and the association is closed.

- 0100H to 0212H. Error. The writing *"Error xxx"* is displayed and the association is closed.

- 0213H Resource limitation. The writing *"Failure: resource limitation"* is displayed and the association is closed.

- A7xxH Out of resources. The writing *"SCP out of resources"* is displayed and the association is closed.

- CxxxH Cannot understand. The writing *"Failure: error Cxxx"* is displayed and the association is closed.

- BxxxH Warning. The writing *"Warning: error Bxxx"* is displayed and the association is closed.

2.1.2.5   Transfer of a still image – X-Ray Radiofluoroscopic Image Storage

2.1.2.5.1   Associated real-world activity

The request to transfer a XRF still multiframe image starts an association negotiation for the *X-Ray Radiofluoroscopic Storage Service.*

2.1.2.5.2   Proposed presentation contexts

A single Presentation Context is offered for an association, with Abstract Syntax related to the "X-Ray Radiofluoroscopic Image Storage" and Transfer Syntax "JPEG Lossless, Non-Hierarchical, First-Order Prediction, Process 14, Selection Value 1". No extended negotiation is performed. Default SCU role is assumed. See table 2.1.2.5.2-1.

Table 2.1.2.5.2-1 Proposed presentation contex for HNDI XRF-Storage

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name**	**UID**		
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	Jpeg Lossless non-hirarchical,First -order Prediction P14 Transfer Syntax	1.2.840.10008.1.2.4.70	SCU	None
		DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2		
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		

2.1.2.5.2.1 SOP specific conformance statement for XRF Image Storage SOP Class

Standard Conformance is provided to the X-Ray Radiofluoroscopic Image Storage SOP Class (1.2.840.10008.5.1.4.1.1.12.2) of the DICOM Image Storage Service Class.

The supported attributes of the associated XRF image IOD are listed in the table 2.1.2.5.2.1-1. All type 1 attributes will be sent with a length different from zero; all type 2 attributes listed in the table will be sent, possibly with a length of zero. All type 3 attributes may or may not be transmitted, possibly with a length of 0, depending on the parameters passed to HNDI by the application requesting the service.

Table 2.1.2.5.2.1-1 XRF Image IOD

Group	Element	Attribute Description	Type	Note
0008	0005	Specific character set	1C	
0008	0008	Image Type	1	
0008	0016	SOP Class UID	1	
0008	0018	SOP Instance UID	1	

0008	0020	Study Date	2	
0008	0021	Series Date	3	
0008	0022	Acquisition Date	3	
0008	0023	Content Date	3	
0008	002A	Acquisition Datetime	3	
0008	0030	Study Time	2	
0008	0031	Series Time	3	
0008	0032	Acquisition Time	3	
0008	0033	Content Time	3	
0008	0050	Accession Number	2	
0008	0060	Modality	1	Fixed "RF"
0008	0070	Manufacturer	2	
0008	0080	Institution Name	3	
0008	0081	Institution Address	3	
0008	0090	Referring Physician's Name	2	
0008	1010	Station Name	3	
0008	1030	Study Description	3	
0008	1032	Procedure Code Sequence	3	
> *Include "Code Sequence Macro"*				
0008	103E	Series Description	3	
0008	1050	Performing Physicians' Name	3	
0008	1070	Operator's Name	3	
0008	1090	Manufacturer's Model Name	3	
0008	1110	Referenced Study Sequence	3	
0008	1150	>Referenced SOP Class UID	1C	
0008	1155	>Referenced SOP Instance UID	1C	
0008	1111	Referenced Performed Procedure Step Sequence	3	
0008	1150	>Referenced SOP Class UID	1C	
0008	1155	>Referenced SOP Instance UID	1C	
0008	2112	Source Image Sequence	3	
0008	1150	>Referenced SOP Class UID	1C	
0008	1155	>Referenced SOP Instance UID	1C	
0010	0010	Patient's Name	2	
0010	0020	Patient's ID	2	
0010	0030	Patient's Birth Date	2	
0010	0040	Patient's Sex	2	
0010	1000	Other Patient ID	3	
0010	1020	Patient's Size	3	
0010	1030	Patient's Weight	3	
0010	1040	Patient's Address	3	

0010	2154	Patient's Telephone Numbers	3	
0010	2160	Ethnic Group	3	
0010	2180	Patient Occupation	3	
0010	4000	Patient Comments	3	
0018	0010	Contrast/Bolus Agent	2	
0018	0015	Body Part Examined	3	
0018	0040	Cine Rate	3	
0018	0060	KVP	2	
0018	1000	Device Serial Number	3	
0018	1020	Software Version	3	
0018	1030	Protocol Name	3	
0018	1065	Frame Time Vector	1	
0018	1110	Distance Source to Detector	3	
0018	1111	Distance Source to Patient	3	
0018	1114	Estimated Radiogr. Magnif. Factor	3	
0018	1147	Field of View Shape	3	
0018	1149	Field of View Dimension(s)	3	
0018	1150	Exposure Time	2	
0018	1151	X-Ray Tube Current	2	
0018	1152	Exposure	2C	
0018	1153	Exposure in uAs	3	
0018	1155	Radiation Setting	1	
0018	115A	Radiation Mode	3	
0018	115E	Image Area Dose Product	3	
0018	1164	Imager Pixel Spacing	1	
0018	1166	Grid	3	
0018	1405	Relative X-Ray Exposure	3	
0018	1460	Tomo Layer Height	1C	
0018	1470	Tomo Angle	3C	
0018	1480	Tomo Time	3C	
0018	1490	Tomo Type	3C	
0018	6000	Sensitivity	3	
0018	7004	Detector Type	3	
0018	7005	Detector Configuration	3	
0018	7011	Detector Binning	3	
0018	7024	Detector Active Shape	3	
0018	7026	Detector Dimension(s)	3	
0018	702A	Detector Manufacturer's Name	3	
0018	702B	Detector Manufacturer's Model Name	3	
0018	8150	Exposure Time in us	3	

0018	8151	X-Ray Tube Current in uA	3	
0020	000D	Study Instance UID	1	
0020	000E	Series Instance UID	1	
0020	0010	Study ID	2	
0020	0011	Series Number	2	
0020	0013	Instance Number	2	
0020	0020	Patient Orientation	2	
0020	0062	Image Laterality	1	
0028	0002	Samples per Pixel	1	Fixed: "1"
0028	0004	Photometric Interpretation	1	Fixed: "MONOCHROME2"
0028	0008	Number of Frames	1	
0028	0009	Frame Increment Pointer	1	
0028	0010	Rows	1	
0028	0011	Columns	1	
0028	0030	Pixel Spacing	3	
0028	0034	Pixel Aspect Ratio	1C	
0028	0100	Bits Allocated	1	
0028	0101	Bits Stored	1	
0028	0102	High Bit	1	
0028	0103	Pixel Representation	1	Fixed: "0"
0028	0300	Quality Control Image	3	
0028	0301	Burned In Annotation	3	
0028	1040	Pixel Intensity Relationship	1	
0028	2110	Lossy Image Compression	1	
0040	0244	Performed Procedure Step Start Date	3	
0040	0245	Performed Procedure Step Start Time	3	
0040	0253	Performed Procedure Step ID	3	
0040	0254	Performed Procedure Step Description	3	
0040	0260	Performed Protocol Code Sequence	3	
> *Include "Code Sequence Macro"*				
0040	0275	Request Attribute Sequence	3	
0032	1060	> Requested Procedure Description	3	
0040	0007	> Scheduled Procedure Step Description	3	
0040	0008	> Scheduled Protocol Code Sequence	3	
>> *Include "Code Sequence Macro"*				
0040	0009	> Scheduled Procedure Step ID	3	
0040	1001	> Requested Procedure ID	1C	
0050	0004	Calibration Image	3	
7FE0	0010	Pixel Data	1	

HNDI accepts status codes from C-STORE service and performs actions as in the following list:

- 0000H   Success. The writing *"Transfer complete"* is displayed and the association is closed.

- 0100H to 0212H. Error. The writing *"Error xxx"* is displayed and the association is closed.

- 0213H Resource limitation. The writing *"Failure: resource limitation"* is displayed and the association is closed.

- A7xxH Out of resources. The writing *"SCP out of resources"* is displayed and the association is closed.

- CxxxH Cannot understand. The writing *"Failure: error Cxxx"* is displayed and the association is closed.
- BxxxH   Warning. The writing *"Warning: error Bxxx"* is displayed and the association is closed.

2.1.2.6   Printing of a still image

2.1.2.6.1   Associated real-world activity

The request to print a still image starts an association negotiation for the *Basic Grayscale Print Management Service.*

2.1.2.6.2   Proposed presentation contexts

A single Presentation Context is offered for an association, with Abstract Syntax related to the "Basic Grayscale Print Management Meta SOP Class" and Transfer Syntax "Implicit VR Little Indian". No extended negotiation is performed. Default SCU role is assumed. See table 2.1.2.6.2-1.

Table 2.1.2.6.2-1 Proposed presentation contex for HNDI Print

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name**	**UID**		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None

2.1.2.6.2.1 SOP specific conformance statement for DICOM Print Service Classes

Standard Conformance is provided to the Basic Grayscale Print Management Meta SOP Class (1.2.840.10008.5.1.1.9) of the DICOM Print Management Service Class. For each SOP Class belonging to the Basic Grayscale Print Management Meta SOP Class a standard conformance is provided; any specific implementation details are described in the following sections.

2.1.2.6.2.1.1 Basic Film Session SOP Class

N-CREATE. This service will be used to create a Film Session instance. Table 2.1.2.6.2.1.1-1 shows service attributes.

Table 2.1.2.6.2.1.1-1 Basic Film Session N-CREATE attributes

Group	Element	Attribute Description	Note
0008	0005	Specific character set	
2000	0010	Number of Copies	
2000	0020	Print Priority	
2000	0030	Medium Type	
2000	0040	Film Destination	
2000	0050	Film Session Label	

All optional attributes could not be inserted in the message, depending on SCP print features and SCU user selections.

N-SET. HNDI never uses this service.

N-ACTION. This service will be used to create a Print Job Instance to print the whole printing session. No specific attribute will be included. Depending on SCP capabilities, SCU can be configured to print whole session in a single Print Job or to print each film by mean of separated N-ACTION Print Film Box services (see Basic Film Box SOP Class).

N-DELETE. This service will be used to delete the whole Print Session after the Print Job instance creation.

HNDI accepts status codes from N-CREATE, N-ACTION, N-DELETE services and performs actions as in the following list:

- 0000H   Success.
             N-CREATE/N-ACTION: the operations continue.
             N-DELETE: the association is closed and the local copy of the session is destroyed.

- 0100H to 0212H. Error. The writing *"Error xxx"* is associated to the local copy of the session and the association is closed.

- 0213H Resource limitation. The writing *"Error 213H"* is associated to the local copy of the session and the association is closed.

- CxxxH Failure. The writing *"Error Cxxx"* is associated to the local copy of the session and the association is closed.

- BxxxH   Warning. The writing *"Error Bxxx"* is associated to the local copy of the session and the association is closed.

2.1.2.6.2.1.2 Basic Film Box SOP Class

N-CREATE. This service will be used to create a Film Box instance. Table 2.1.2.6.2.1.2-1 shows service attributes.

Table 2.1.2.6.2.1.2-1 Basic Film Box N-CREATE attributes

Group	Element	Attribute Description	Note

0008	0005	Specific character set	
2010	0010	Image Display Format	
2010	0030	Annotation Display Format ID	
2010	0040	Film orientation	
2010	0050	Film Size ID	
2010	0060	Magnification Type	
2010	0080	Smoothing Type	
2010	0100	Border Density	
2010	0110	Empty Image Density	
2010	0140	Trim	
2010	0500	Referenced Film Session Sequence	
0008	1150	>Referenced SOP Class UID	
0008	1155	>Referenced SOP Instance UID	
2020	0050	>Requested Resolution ID	

All optional attributes could not be inserted in the message, depending on SCP print features and SCU user selections.

N-SET. HNDI never uses this service.

N-ACTION. This service will be used to create a Print Job Instance to print a single Film Box. No specific attribute will be included. Depending on SCP capabilities, SCU can be configured to print each film box separately or to print the whole print session by mean of the N-ACTION Print Film Session service (see Basic Film Session SOP Class).

N-DELETE. HNDI never uses this service.

HNDI accepts status codes from N-CREATE/N-ACTION services and performs actions as in the following list:

> - 0000H Success. The oerations continue.

> - 0100H to 0212H. Error. The writing *"Error xxx"* is associated to the local copy of the session and the association is closed.

> - 0213H Resource limitation. The writing *"Error 213"* is associated to the local copy of the session and the association is closed.

> - CxxxH Failure. The writing *"Error Cxxx"* is associated to the local copy of the session and the association is closed..

> - BxxxH Warning. The writing *"Error Bxxx"* is associated to the local copy of the session and the association is closed.

2.1.2.6.2.1.3 Basic Grayscale Image SOP Class

N-SET. This service will be used to update a Grayscale Image instance. Table 2.1.2.6.2.1.3-1 shows service attributes.

Table 2.1.2.6.2.1.3-1 Basic Grayscale Image Box N-SET attributes

Group	Element	Attribute Description	Note
0008	0005	Specific character set	
2020	0010	Image Position	Fixed: 1
2020	0110	Preformatted Grayscale Image Sequence	
0028	0002	>Samples per Pixel	Fixed: 1
0028	0004	>Photometric Interpretation	Fixed: MONOCHROME2
0028	0010	>Rows	
0028	0011	>Columns	
0028	0100	>Bits Allocated	8,16 (Matches printer capabilities)
0028	0101	>Bits Stored	8-16 (Matches printer capabilities)
0028	0102	>High Bit	(BitsStored-1)-(BitsAllocated-1) (Matches printer capabilities)
0028	0103	>Pixel Representation	Fixed: 0
7FE0	0010	>Pixel Data	

All optional attributes could not be inserted in the message, depending on SCP print features and SCU user selections.

HNDI accepts status codes from N-SET services and performs actions as in the following list:

- 0000H Success. The operations continue.

- 0100H to 0212H. Error. The writing *"Error xxx"* is associated to the local copy of the session and the association is closed.

- 0213H Resource limitation. The writing *"Error 213"* is associated to the local copy of the session and the association is closed.

- CxxxH Failure. The writing *"Error Cxxx"* is associated to the local copy of the session and the association is closed.

2.1.2.7   Uploading worlist

2.1.2.7.1   Associated real-world activity

The request to get the worklist starts an association negotiation for the *Basic Worklist Management Service.*

2.1.2.7.2   Proposed presentation contexts

A single Presentation Context is offered for an association, with Abstract Syntax related to the "Modality Worklist Information Model" and Transfer Syntax "Implicit VR Little Indian". No extended negotiation is performed. Default SCU role is assumed. See table 2.1.2.7.2-1.

Table 2.1.2.7.2-1 Proposed presentation contex for HNDI Worklist

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name**	**UID**		
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1. 4.31	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None

2.1.2.7.2.1 SOP specific conformance statement for Modality Worklist SOP Class

Standard Conformance is provided to the Modality Worklist Information Model - FIND SOP Class (1.2.840.10008.5.1.4.31) of the DICOM Basic Worklist Management Service.

All the attributes listed in the table 2.1.2.7.2.1-1 will be requested. HNDI, according to the user selections, may request attribute matching as shown in the column *Matching Type*. HNDI does not consider an error any unsupported attribute matching by SCP (both on optional or on required attributes). Furthermore, it is non considered and error the absence in C-FIND-RSP of any type 1C requested attribute.

Table 2.1.2.7.2.1-1 Worklist C-FIND-REQ/RSP Data Set

Group	Element	Attribute Description	Type	Matching Type
0008	0005	Specific character set	1C	
0008	0050	Accession Number	3	Single value
0008	0090	Referring Physician's Name	3	
0008	1110	Referenced Study Sequence	3	
0010	0010	Patient Name	1	Single value / Wildcard
0010	0020	Patient ID	1	Single value
0010	0030	Patient Birth Date	2	
0010	0040	Patient Sex	3	
0020	000D	Study Instance UID	1	
0020	0010	Study ID	3	
0032	1060	Requested Procedure Description	1C	
0032	1064	Requested Procedure Code Sequence	3	
0040	0100	Scheduled Procedure Step Sequence	1	
0008	0060	> Modality	1	Single value or return key
0040	0001	> Scheduled Station AE title	1	Single value
0040	0002	> Scheduled Procedure Step Start Date	1	Single value / Range matching
0040	0003	> Scheduled Procedure Step Start Time	1	Single value / Range matching
0040	0006	> Scheduled Performing Physiscian Name	2	
0040	0007	> Scheduled Procedure Step Description	1C	
0040	0008	> Scheduled Protocol Code Sequence	3	
0040	0009	> Scheduled Procedure Step ID	3	
0040	0010	> Scheduled Station Name	3	
0040	0011	> Scheduled Procedure Step Location	3	

0040	1001	Requested Procedure ID		3	Single value

HNDI accepts status codes from C-FIND service and performs actions as in the following list:

- 0000H   Success. The working list is displayed in a dedicated dialog form.

- Any other error code is managed by closing the association and displaying an explicative error writing.

2.1.2.8   Creating and updating Modality Performed Procedure Step

2.1.2.8.1   Associated real-world activity

The system can be configured to request the creation and/or setting of remote MPPS on typical events related to examination/images life cycle. These requests start an association negotiation for the *Modality Performed Procedure Step Service.*

2.1.2.8.2   Proposed presentation contexts

A single Presentation Context is offered for an association, with Abstract Syntax related to the "Modality Performed Procedure Step SOP Class" and Transfer Syntax "Implicit VR Little Indian". No extended negotiation is performed. Default SCU role is assumed. See table 2.1.2.8.2-1.

Table 2.1.2.8.2-1 Proposed presentation contex for HNDI MPPS

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name**	**UID**		
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None

2.1.2.8.2.1 SOP specific conformance statement for Modality Performed Procedure Step SOP Class

Standard Conformance is provided to the Modality Performed Procedure Step SOP Class (1.2.840.10008.3.1.2.3.3).

The supported attributes building the data set of N-CREATE and N-SET messages are listed in the tables 2.1.2.8.2.1-1 and 2.1.2.8.2.1-2. All type 1 attributes will be sent with a length different from zero; all type 2 attributes listed in the table will be sent, possibly with a length of zero. All type 3 attributes may or may not be transmitted, possibly with a length of 0, depending on the parameters passed to HNDI by the application requesting the service. Furthermore all attributes labeled with "Final State" 1 or 2 in the Dicom Standard, will be sent according with that state at least in the data set of one message; the choice of the message including these attributes (N-CREATE or N-SET) will be done according with the availability of the parameters at the moment of the request.

Table 2.1.2.8.2.1-1 MPPS N-CREATE Data Set

Group	Element	Attribute Description	Type (Final State)	Note
0008	0005	Specific character set	1C	
0008	0060	Modality	1	
0008	1032	Procedure Code Sequence	2	
0008	1110	Referenced Study Sequence	3	
0008	1150	>Referenced SOP Class UID	1C	
0008	1155	>Referenced SOP Instance UID	1C	
0008	1120	Referenced Patient Sequence	2	Always empty
0010	0010	Patient Name	2	
0010	0020	Patient ID	2	
0010	0030	Patient Birth Date	2	
0010	0040	Patient Sex	2	
0018	115E	Image Area Dose Product	3	
0020	0010	Study ID	2	
0040	0241	Performed Station AE title	1	
0040	0242	Performed Station Name	2	
0040	0243	Performed Location	2	
0040	0244	Performed Procedure Step Start Date	1	
0040	0245	Performed Procedure Step Start Time	1	
0040	0250	Performed Procedure Step End Date	2 (1)	
0040	0251	Performed Procedure Step End Time	2 (1)	
0040	0252	Performed Procedure Step Status	1	
0040	0253	Performed Procedure Step ID	1	
0040	0254	Performed Procedure Step Description	2	
0040	0255	Performed Procedure Type Description	2	
0040	0260	Performed Protocol Code Sequence	2	
> *Include "Code Sequence Macro"*				
0040	0270	Scheduled Step Attribute Sequence	1	
0008	0050	> Accession Number	2	
0008	1110	> Referenced Study Sequence	2	Always empty
0020	000D	> Study Instance UID	1	
0032	1060	> Requested Procedure Description	2	
0040	0007	> Scheduled Procedure Step Description	2	
0040	0008	> Scheduled Protocol Code Sequence	2	
> *Include "Code Sequence Macro"*				
0040	0009	> Scheduled Procedure Step ID	2	
0040	1001	> Requested Procedure ID	2	
0040	0300	Total Time of Fluoroscopy	3	

0040	0301	Total Number of Exposures	3	
0040	030E	Exposure Dose Sequence	3	
0018	0060	> KVp	3	
0018	1150	> Exposure Time	3	
0018	115A	> Radiation Mode	3	
0018	8151	> X-ray Tube Current in uA	3	
0040	0310	Comments on Radiation Dose	3	
0040	0340	Performed Series Sequence	2 (1)	
0008	0054	> Retrieve AE Title	2 (2)	
0008	103E	> Series Description	2 (2)	
0008	1050	> Performing Physician's Name	2 (2)	
0008	1070	> Operator's Name	2 (2)	
0008	1140	> Referenced Image Sequence	2 (2)	
0008	1150	>> Referenced SOP Class UID	1	
0008	1155	>> Referenced SOP Instance UID	1	
0018	1030	> Protocol Name	1 (1)	
0020	000E	> Series Instance UID	1 (1)	
0040	0220	> Referenced Non-Image Composite SOP Instance Sequence	2 (2)	Always empty

Table 2.1.2.8.2.1-2 MPPS N-SET Data Set

Group	Element	Attribute Description	Type (Final State)	Note
0008	0005	Specific character set	1C	
0008	1032	Procedure Code Sequence	3	
0018	115E	Image Area Dose Product	3	
0040	0250	Performed Procedure Step End Date	3 (1)	
0040	0251	Performed Procedure Step End Time	3 (1)	
0040	0252	Performed Procedure Step Status	3	
0040	0254	Performed Procedure Step Description	3	
0040	0255	Performed Procedure Type Description	3	
0040	0260	Performed Protocol Code Sequence	3	
> Include "Code Sequence Macro"				
0040	0300	Total Time of Fluoroscopy	3	
0040	0301	Total Number of Exposures	3	
0040	030E	Exposure Dose Sequence	3	
0018	0060	> KVp	3	
0018	1150	> Exposure Time	3	
0018	115A	> Radiation Mode	3	
0018	8151	> X-ray Tube Current in uA	3	

0040	0310	Comments on Radiation Dose	3	
0040	0340	Performed Series Sequence	3 (1)	
0008	0054	> Retrieve AE Title	2 (2)	
0008	103E	> Series Description	2 (2)	
0008	1050	> Performing Physician's Name	2 (2)	
0008	1070	> Operator's Name	2 (2)	
0008	1140	> Referenced Image Sequence	2 (2)	
0008	1150	>> Referenced SOP Class UID	1	
0008	1155	>> Referenced SOP Instance UID	1	
0018	1030	> Protocol Name	1 (1)	
0020	000E	> Series Instance UID	1 (1)	
0040	0220	> Referenced Non-Image Composite SOP Instance Sequence	2 (2)	Always empty

HNDI accepts status codes from N-CREATE and N-SET service and performs actions as in the following list:

   - 0000H   Success. The MPPS notification is internally marked as "successful".

   - Any other error code is managed by closing the association and displaying an explicative error writing.

2.1.2.9   Requesting Storage Commitment

2.1.2.9.1   Associated real-world activity

The system can be configured to request the storage commitment of each image transferred to a remote SCP with any of the above descripted storage services. This request starts an association negotiation for the *Storage Commitment Service.* The AE title of the *Storage Commitment Service* SCP can be programmed; each *Storage Service* SCP has an associated *Storage Commitment Service* SCP.

2.1.2.9.2   Proposed presentation contexts

A single Presentation Context is offered for an association, with Abstract Syntax related to the "Storage Commitment Push Model SOP Class" and Transfer Syntax "Implicit VR Little Indian". No extended negotiation is performed. Default SCU role is assumed. See table 2.1.2.9.2-1.

Table 2.1.2.9.2-1 Proposed presentation contex for HNDI Storage Commitment

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Storage Commitment SOP Class	1.2.840.10008.2.20.1	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None

2.1.2.9.2.1 SOP specific conformance statement for Storage Commitment SOP Class

Standard Conformance is provided to the Storage Commitment SOP Class (1.2.840.10008.1.20.1).

HNDI accepts N-EVENT-REPORT only on an association separated from the N-ACTION one.

The supported attributes building the data set of N-ACTION sent and N-EVENT-REPORT received messages are listed in the tables 2.1.2.9.2.1-1 and 2.1.2.9.2.1-2. All type 1 attributes will be sent with a length different from zero; all type 2 attributes listed in the table will be sent, possibly with a length of zero. All type 3 attributes may or may not be transmitted, possibly with a length of 0, depending on the parameters passed to HNDI by the application requesting the service.

Table 2.1.2.9.2.1-1 Storage Commitment N-ACTION Data Set

Group	Element	Attribute Description	Type	Note
0008	0005	Specific character set	1C	
0008	1195	Transaction UID	1	
0008	1199	Referenced SOP Sequence	1	
0008	1150	> Referenced SOP Class UID	1	
0008	1155	> Reference SOP Instance UID	1	

Table 2.1.2.9.2.1-2 Storage Commitment N-EVENT-REPORT Data Set

Group	Element	Attribute Description	Type	Note
0008	0005	Specific character set	1C	
0008	0054	Retrieve AE Title	3	
0008	1195	Transaction UID	1	
0008	1198	Failed SOP Sequence	1	Only if Event Type = 2
0008	1150	> Referenced SOP Class UID	1	Only if Event Type = 2
0008	1155	> Reference SOP Instance UID	1	Only if Event Type = 2
0008	1197	> Failure Reason	1	Only if Event Type = 2
0008	1199	Referenced SOP Sequence	1	
0008	0054	> Retrieve AE Title	3	
0008	1150	> Referenced SOP Class UID	1	
0008	1155	> Reference SOP Instance UID	1	
0088	0130	> Storage Media File-Set ID	3	
0088	0140	> Storage Media File-Set UID	3	
0088	0130	Storage Media File-Set ID	3	
0088	0140	Storage Media File-Set UID	3	

HNDI accepts status codes from N-ACTION service and performs actions as in the following list:

- 0000H   Success. The system close association and wait for N-EVENT-REPORT message on a separate association.

- Any other error code is managed by closing the association and displaying an explicative error writing.

HNDI accepts N-EVENT-REPORT messages and performs actions as in the following list:

- Replays with a status code of 0000H. If the transaction is still active and the commitment has been accepted, the images listed in the transaction are marked as commited and can be deleted (if the option "enable deleting image only if storage commited" is set).

- Any other error code or the presence in the message of failed commitment are managed by closing the association and displaying an explicative error writing.

2.1.2.10   Querying and retrieving studies

2.1.2.10.1 Associated real-world activity

The operator can select a set of key used by HNDI to find usefull studies on a remote DICOM archive. The remote DICOM AE sends back a list of matching studies. The operatore selects one or more studies that will be retrieved by HNDI interface. The retrieved studies, stored locally in DICOM 3.0 PS 10 (DICOMDIR file set) can be displayed but can not be modified. To delete the retrieved studies a dedicated command is provided.

2.1.2.10.2 Finding studies

2.1.2.10.2.1 Proposed presentation contexts

Each remote Query/Retrieve SCP peer must be be configured to operate in one of the two standard mode: "Patient Root Query/Retrieve" or "Study Root Query/Retrieve"; a dedicated dialog allows the setup operation.

A single Presentation Context is offered for an association, with Abstract Syntax related to the "Patient Root Query/Retrieve Information Model - FIND SOP Class" and Transfer Syntax "Implicit VR Little Indian" or "Study Root Query/Retrieve Information Model - FIND SOP Class" and Transfer Syntax "Implicit VR Little Indian". No extended negotiation is performed. Default SCU role is assumed. See tables 2.1.2.10.2.1-1 and 2.1.2.10.2.1-2.

Table 2.1.2.10.2.1-1
Proposed presentation context for HNDI Patient Root Q/R IM - FIND

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Patient Root Q/R IM – FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None

Table 2.1.2.10.2.1-2
Proposed presentation context for HNDI Study Root Q/R IM - FIND

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name**	**UID**		
Study Root Q/R IM – FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None

2.1.2.10.2.2 SOP specific conformance statement for Patient Root Q/R IM - FIND SOP Class

Standard Conformance is provided to the Patient Root Q/R IM - FIND SOP Class (1.2.840.10008.5.1.4.1.2.1.1). The following tables list the requested keys for each query level. All mandatory key are requested; furthermore a selection of optional parameter listed in the standard will be requested too.

Table 2.1.2.10.2.2-1
Patient Root Q/R IM - FIND: Patient level keys

Group	Element	Attribute Key	Matching Type
0010	0010	Patient's Name	Single Value matching or Wild Card matching or Universal matching
0010	0020	Patient ID	Single Value matching or Universal matching
0010	0030	Patient's Birth Date	Universal matching
0010	0040	Patient's Sex	Universal matching

Table 2.1.2.10.2.2-2
Patient Root Q/R IM - FIND: Study level keys

Group	Element	Attribute Key	Matching Type
0008	0020	Study Date	Universal matching
0008	0030	Study Time	Universal matching
0008	0050	Accession Number	Universal matching
0008	0061	Modalities In Study	Universal matching
0008	1030	Study Description	Universal matching
0010	0010	Patient's Name	Single Value matching or Universal matching
0010	0020	Patient ID	Single Value matching or Universal matching
0020	000D	Study Instance UID	Universal matching
0020	0010	Study ID	Universal matching
0020	1208	Number of Study Related Instances	Universal matching

Table 2.1.2.10.2.2-3
Patient Root Q/R IM - FIND: Series level keys

Group	Element	Attribute Key	Matching Type
0008	0060	Modality	Universal matching
0010	0020	Patient ID	Single Value matching
0020	000D	Study Instance UID	Single Value matching
0020	000E	Series Instance UID	Universal matching
0020	0011	Series Number	Universal matching

Table 2.1.2.10.2.2-4
Patient Root Q/R IM - FIND: Composite Object Instance level keys

Group	Element	Attribute Key	Matching Type
0008	0016	SOP Class UID	Universal matching
0008	0018	SOP Instance UID	Universal matching
0010	0020	Patient ID	Single Value matching
0020	000D	Study Instance UID	Single Value matching
0020	000E	Series Instance UID	Single Value matching
0020	0013	Instance Number	Universal matching

HNDI accepts status codes from C-FIND service and performs actions as in the following list:

- 0000H Success. The record received are displayed.
- Any other error code. The results already received up to that point are displayed to the operator and the error reason is shown and logged.

2.1.2.10.2.3 SOP specific conformance statement for Study Root Q/R IM - FIND SOP Class

Standard Conformance is provided to the Study Root Q/R IM - FIND SOP Class (1.2.840.10008.5.1.4.1.2.2.1). The following tables list the requested keys for each query level. All mandatory key are requested; furthermore a selection of optional parameter listed in the standard will be requested too.

Table 2.1.2.10.2.3-1
Study Root Q/R IM - FIND: Study level keys

Group	Element	Attribute Key	Matching Type
0008	0020	Study Date	Universal matching
0008	0030	Study Time	Universal matching
0008	0050	Accession Number	Universal matching
0008	0061	Modalities In Study	Universal matching
0008	1030	Study Description	Universal matching
0010	0010	Patient's Name	Single Value matching or Wild Card matching or Universal matching

0010	0020	Patient ID	Single Value matching or Universal matching
0010	0030	Patient's Birth Date	Universal matching
0010	0040	Patient's Sex	Universal matching
0020	0010	Study ID	Universal matching
0020	000D	Study Instance UID	Universal matching
0020	1208	Number of Study Related Instances	Universal matching

Table 2.1.2.10.2.3-3
Study Root Q/R IM - FIND: Series level keys

Group	Element	Attribute Key	Matching Type
0008	0060	Modality	Universal matching
0020	000D	Study Instance UID	Single Value matching
0020	000E	Series Instance UID	Universal matching
0020	0011	Series Number	Universal matching

Table 2.1.2.10.2.3-4
Study Root Q/R IM - FIND: Composite Object Instance level keys

Group	Element	Attribute Key	Matching Type
0008	0016	SOP Class UID	Universal matching
0008	0018	SOP Instance UID	Universal matching
0020	000D	Study Instance UID	Single Value matching
0020	000E	Series Instance UID	Single Value matching
0020	0013	Instance Number	Universal matching

HNDI accepts status codes from C-FIND service and performs actions as in the following list:

- 0000H Success. The record received are displayed.

- Any other error code. The results already received up to that point are displayed to the operator and the error reason is shown and logged.

2.1.2.10.3   Retrieving studies

2.1.2.10.3.1 Proposed presentation contexts

A single Presentation Context is offered for an association, with Abstract Syntax related to the "Patient Root Query/Retrieve Information Model - MOVE SOP Class" and Transfer Syntax "Implicit VR Little Indian" or "Study Root Query/Retrieve Information Model - MOVE SOP Class" and Transfer Syntax "Implicit VR Little Indian". No extended negotiation is performed. Default SCU role is assumed. See tables 2.1.2.10.3.1-1 and 2.1.2.8.10.1-2.

Table 2.1.2.10.3.1-1
Proposed presentation context for HNDI Patient Root Q/R IM - MOVE

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name**	**UID**		
Patient Root Q/R IM – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None

Table 2.1.2.10.3.1-2
Proposed presentation context for HNDI Study Root Q/R IM - MOVE

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name**	**UID**		
Study Root Q/R IM – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None

2.1.2.10.3.2 SOP specific conformance statement for Patient Root Q/R IM - MOVE SOP Class

Standard Conformance is provided to the Patient Root Q/R IM - MOVE SOP Class (1.2.840.10008.5.1.4.1.2.1.2). The requested keys are listed in the following tables. The MOVE destination AE title will always be the HNDI AE title.

Table 2.1.2.10.3.2-1
Patient Root Q/R IM - MOVE: Study level keys

Group	Element	Attribute Key	Matching Type
0010	0020	Patient ID	Single Value matching
0020	000D	Study Instance UID	Single Value matching

Table 2.1.2.10.3.2-2
Patient Root Q/R IM - MOVE: Series level keys

Group	Element	Attribute Key	Matching Type
0010	0020	Patient ID	Single Value matching
0020	000D	Study Instance UID	Single Value matching
0020	000E	Series Instance UID	Single Value matching

Table 2.1.2.10.3.2-3
Patient Root Q/R IM - MOVE: Composite Object Instance level keys

Group	Element	Attribute Key	Matching Type
0008	0018	SOP Instance UID	Single Value matching

0010	0020	Patient ID	Single Value matching
0020	000D	Study Instance UID	Single Value matching
0020	000E	Series Instance UID	Single Value matching

HNDI accepts status codes from C-MOVE service and performs actions as in the following list:

- 0000H Success. The system wait for image instances to be received in a C-STORE separate association.
- Any other error code. The error reason is shown and logged.

2.1.2.10.3.3 SOP specific conformance statement for Study Root Q/R IM - MOVE SOP Class

Standard Conformance is provided to the Study Root Q/R IM - MOVE SOP Class (1.2.840.10008.5.1.4.1.2.2.2). The requested keys are listed in the following tables. The MOVE destination AE title will always be the HNDI AE title.

Table 2.1.2.10.3.3-1
Study Root Q/R IM - MOVE: Study level keys

Group	Element	Attribute Key	Matching Type
0020	000D	Study Instance UID	Single Value matching

Table 2.1.2.10.3.3-2
Study Root Q/R IM - MOVE: Series level keys

Group	Element	Attribute Key	Matching Type
0020	000D	Study Instance UID	Single Value matching
0020	000E	Series Instance UID	Single Value matching

Table 2.1.2.10.3.3-3
Study Root Q/R IM - MOVE: Composite Object Instance level keys

Group	Element	Attribute Key	Matching Type
0008	0018	SOP Instance UID	Single Value matching
0020	000D	Study Instance UID	Single Value matching
0020	000E	Series Instance UID	Single Value matching

HNDI accepts status codes from C-MOVE service and performs actions as in the following list:

- 0000H Success. The system wait for image instances to be received in a C-STORE separate association.

- Any other error code. The error reason is shown and logged.

2.1.3 Association acceptance policy

2.1.3.1 Remote communication verification

2.1.3.1.1 Associated real-world activity

When a remote DICOM peer requests the communication verification an association is accepted.

2.1.3.1.2 Presentation context table

A single Presentation Context is accepted for an association, with Abstract Syntax related to the "Verification SOP Class" and Transfer Syntax "Implicit VR Little Indian". No extended negotiation is accepted. Default SCP role is assumed. See table 2.1.3.1.2-1.

Table 2.1.3.1.2-1 Acceptable presentation context for HNDI Verification

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name**	**UID**		
Verification SOP Class	1.2.840.10008.1.1	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCP	None

2.1.3.1.2.1 SOP specific conformance statement for Verification SOP Class

Standard Conformance is provided to the Verification SOP Class (1.2.840.10008.1.1) of the DICOM Image Storage Service Class. HNDI returns the following status code in C-ECHO service response:

- 0000H Success.

2.1.3.1.3 Presentation context acceptance criterion

Not applicable.

2.1.3.1.4 Transfer syntax selection policies

Not applicable.

2.1.3.2 Remote image instances receiving

2.1.3.2.1 Associated real-world activity

Image receiving on a C-STORE association is enabled only as an activity following a Query/Retrieve C-MOVE command. Images are stored in system archive and grouped in studies to be displayed.

2.1.3.2.2 Presentation context table

A single Presentation Context is accepted for an association, with Abstract Syntax related to the "CR/DX/XA/XRF Storage SOP Class" and Transfer Syntax "Implicit VR Little Indian"/"Jpeg Lossless P14". No extended negotiation is accepted. Default SCP role is assumed. See table 2.1.3.2.2-1.

Table 2.1.3.2.2-1 Acceptable presentation contexts for HNDI Storage

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name**	**UID**		
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCP	None
Digital X-Ray Image Storage – For Presentation SOP Class	1.2.840.10008.5.1.4.1.1.1.1	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCP	None
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Jpeg Lossless non-hirarchical,First-order Prediction P14 Transfer Syntax	1.2.840.10008.1.2.4.70	SCP	None
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	Jpeg Lossless non-hirarchical,First-order Prediction P14 Transfer Syntax	1.2.840.10008.1.2.4.70	SCP	None

2.1.3.2.2.1 SOP specific conformance statement for CR/DX/XA/XRF Storage SOP Class

Standard Conformance is provided to the CR/DX/XA/XRF Storage SOP Class (1.2.840.10008.5.1.4.1.1.1, 1.2.840.10008.5.1.4.1.1.1.1, 1.2.840.10008.5.1.4.1.1.12.1 and 1.2.840.10008.5.1.4.1.1.12.2) of the DICOM Image Storage Service Class. HNDI returns the following status code in C-STORE service response:

- 0000H Success.

2.1.3.2.3   Presentation context acceptance criterion

Not applicable.

2.1.3.2.4   Transfer syntax selection policies

Not applicable.

3   COMMUNICATION PROFILES

3.1   Supported communication stacks

HNDI provides support to TCP/IP Network Communication Protocols.

3.2   TCP/IP stack

HNDI uses the TCP/IP stack of the Windows NT operating system under which it executes.

3.2.1   API

HNDI is not designed to be ported on different computers.

3.2.2   Physical media support

Current implementation uses Ethernet physical medium, but any medium and low level protocol supported by Windows NT TCP/IP can be adopted in future.

4   EXTENSIONS/SPECIALIZATIONS/PRIVATIZATIONS

Not applicable.

5   CONFIGURATION

A number of operating parameters can be configured by the operator. The "HirisRf43 User Manual" describes how to setup network information and communication parameters from the "DICOM Setup dialog".

5.1   AE title/presentation address mapping

The corrispondence between "AE Title" and <Host><port> names/numbers shall be setup before any attempt to transmit. Furthermore it has to be configured the map of Internet Address and Router Address.

5.2   Configurable parameters

Other configurable parameters are minimum and maximum PDU size and the length of the communication time out. The local AE Title and the TCP port (SCP role) used by HNDI during association are programmable too (their default values are "HIRISDICOM" and 104 respectively).

The "Bits Stored" used to store CR/DX/XA/RF-images to remote AE and the selection between DX and CR or XA/RF are configurable too.

The number of bits stored in an image box send during a print session can be configured to 8 fixed or to best fit the set of the values accepted by the printer.

6   SUPPORT OF EXTENDED CHARACTER SETS

The following specific character set are supported in input/output:

- ISO-IR 100 Latin 1
- ISO-IR 101 Latin 2
- ISO-IR 109 Latin 3
- ISO-IR 110 Latin 4
- ISO-IR 144 Cyrillic
- ISO-IR 127 Arab
- ISO-IR 126 Greek
- ISO-IR 138 Hebrew
- ISO-IR 148 Latin 5
- ISO-IR 192 Unicode UTF-8

The output character set can be selected on a "per remote AE title" basis.

MEDIA INTERCHANGE CONFORMANCE STATEMENT

7   MEDIA INTERCHANGE: INTRODUCTION

Digitec HirisRf43 is equipped with a *Hiris Media Storage Interface* (HMSI) that allows the creation af a CD-R/DVD file-set according with DICOM 3.0 standard.

This document describes the conformance of HMSI to DICOM 3.0 standard.

8   IMPLEMENTATION MODEL

HMSI is an application capable to convert local storage images in a file set on exam base and to write the file set to a CD-R or to a DVD.
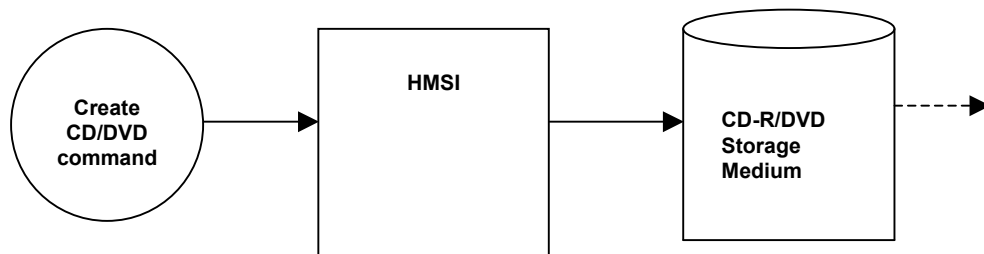

Figure 8.1-1 HMSI Implementation Model

8.1   Application data flow diagram

A dedicated menu command starts CD/DVD image creation and CD/DVD writing. See figure 8.1-1.

8.2   Functional definitions of AE's

When HMSI is invoked, it starts CD/DVD image construction and formatting. Then it let the user execute a standard CD-R/DVD writer application. It returns the command exit status to be displayed on the main monitor (depending on status return code).

8.3   Sequencing of Real-World Activities

Not applicable.

8.4   File Meta Information options

Implementation Class UID: "1.3.76.6.1.1.5.1.1".

Implementation version name: "DIGITEC V5.0".

9 AE SPECIFICATIONS

9.1 HMSI specifications

HMSI provides standard conformance to DICOM Interchange Option of the of the Media Storage Service Class. The Application Profiles and roles are listed in Table 9.1-1.

Table 9.1-1 Application Profiles, Activities and Roles for HMSI

Application Profiles supported	Real World Activity	Role	SC Option
AUG-GEN-CD	Create CD	FSC	Interchange
STD-GEN-DVD	Create DVD	FSC	Interchange

9.1.1 File Meta Information for HMSI

The Source Application Entity Title is set by the user in the Dicom Setup dialog.

9.1.2 Real-World Activity for HMSI

9.1.2.1 Real-World Activity: "Create CD/DVD"

HMSI acts as an FSC using the Interchange Option when requested to create a new CD/DVD.

HMSI uses all the SOP Instances of the selected exam to build a file-set to be written to the media. A corresponding DICOMDIR is created and the file set is written to an empty CD-R/DVD.

9.1.2.1.1 Application Profiles for the RWA: "Create CD/DVD"

The Application Profiles used by HMSI for "Create CD/DVD" RWA are listed in table 9.1-1. Profile AUG-GEN-CD is an extension of the standard profile STD-GEN-CD.

HMSI automatically selects the Application Profile corresponding to the physical medium to be written.

9.1.2.1.1.1 Options

Table 9.1.2.1.1.1-1 lists the SOP Classes supported by the "Create DVD" RWA for the standard profile STD-GEN-DVD.

Table 9.1.2.1.1.1-1 IOD and Transfer Syntax for STD-GEN-DVD

Information Object Definition	SOP Class UID	Transfer Syntax	Transfer Syntax UID
Basic Directory	1.2.840.10008.1.3.10	Explicit VR Little Endian Uncompressed	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 Uncompressed	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 Uncompressed	1.2.840.10008.1.2.1

X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	Jpeg Lossless Process 14 (selection value 1)	1.2.840.10008.1.2.4.70
X-Ray Radiofluroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	Jpeg Lossless Process 14 (selection value 1)	1.2.840.10008.1.2.4.70

10   AUGMENTED AND PRIVATE PROFILES

10.1 Augmented Profiles

HMSI supports the augmented profile AUG-GEN-CD.

10.1.1 AUG-GEN-CD

This Application Profile is an augmentation of the STD-GEN-CD Standard Application profile defined in PS 3.11. The augmentations add support for Jpeg Lossless Process 14 Transfer Syntax for XA and XRF SOP Classes.

10.1.1.1   SOP Class Augmentation

The following IODs are part of the AUG-GEN-CD. There are no requirements or restrictions on SOP options for these IODs beyond those in their standard definitions.

Table 10.1.1.1-1 IOD and Transfer Syntax for AUG-GEN-CD

Information Object Definition	SOP Class UID	Transfer Syntax	Transfer Syntax UID
Basic Directory	1.2.840.10008.1.3.10	Explicit VR Little Endian Uncompressed	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 Uncompressed	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 Uncompressed	1.2.840.10008.1.2.1
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	Jpeg Lossless Process 14 (selection value 1)	1.2.840.10008.1.2.4.70
X-Ray Radiofluroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	Jpeg Lossless Process 14 (selection value 1)	1.2.840.10008.1.2.4.70

This Application Profile does not place any further restrictions on options or extensions for any of these SOP classes. Any otherwise permissible SOP instance is acceptable for the AUG-GEN-CD profile.

10.1.1.2   Directory Augmentations

There are no additional directory keys, records, or options as part of this profile.

10.1.1.3 Other Augmentations

None.

10.2 Private Profiles

None.

11   EXTENSIONS, SPECIALIZATIONS, PRIVATIZATIONS OF SOP CLASSES AND TRANSFER SYNTAXES

None.

12   CONFIGURATION

A number of operating parameters can be configured by the operator. The "HirisRf43 User Manual" describes how to setup media storage parameters from the "DICOM Setup dialog".

Configurable parameters are for example:
- source AE title
- enable overlay embedded in pixel data
- generate a single file-set or two separated file-sets if there are both CR/DX and XA/XRF images in the same study.

13   CHARACTER SET

The following specific character set are supported and are selectable:

- ISO-IR 100 Latin 1
- ISO-IR 101 Latin 2
- ISO-IR 109 Latin 3
- ISO-IR 110 Latin 4
- ISO-IR 144 Cyrillic
- ISO-IR 127 Arab
- ISO-IR 126 Greek
- ISO-IR 138 Hebrew
- ISO-IR 148 Latin 5
- ISO-IR 192 Unicode UTF-8