

NAI Technology Products		DWG. NO.	001-00342-00	Rev. A
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SUBJECT:		DICOM Conformance Statement the DiCOM box PACS Print		
SUPERSEDES		EFFECTIVE DATE:		
ALL				

1.0 INTRODUCTION

This document describes the NAI Technology Products PACS Print conformance to the ACR-NEMA Digital Imaging and Communications in Medicine (DICOM) standard and satisfies the DICOM requirements for a vendor conformance specification.

The PACS Print operates on a Windows based PC and receives digitized images via a DICOM network. It then directs the images to a local or network printer. The images generated are not for diagnostic use.

1.1 DICOM Background

The DICOM information exchange specification provides a definite structure of commands and information that allow for the interoperability of medical imaging devices. Developed by the American College of Radiology (ACR) and the National Electrical Manufacturers Association (NEMA), the DICOM standard strives to promote communication of image information through the use of a standardized set of command classes and information semantics.

The DICOM standard defines classes of information that are common to many modalities of medical imaging. However, to meet the specific needs of information content for such a diverse range of information, the DICOM specification defines structures for a multitude of medical data. To alleviate the need for applications to implement every aspect of the DICOM specification, a list of conformance tables for every service class was created to define the minimum set of information necessary for data exchanges.

A requirement of the DICOM specification is to maintain a compliance document that outlines a subset of DICOM services and data classes that are supported by an application. The purpose of this document is to define a subset of DICOM for the exchange of medical information with the PACS Print product.

This document is written with respect to the ACR-NEMA DICOM version number 3.0.

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1.2 Acronyms and Abbreviations

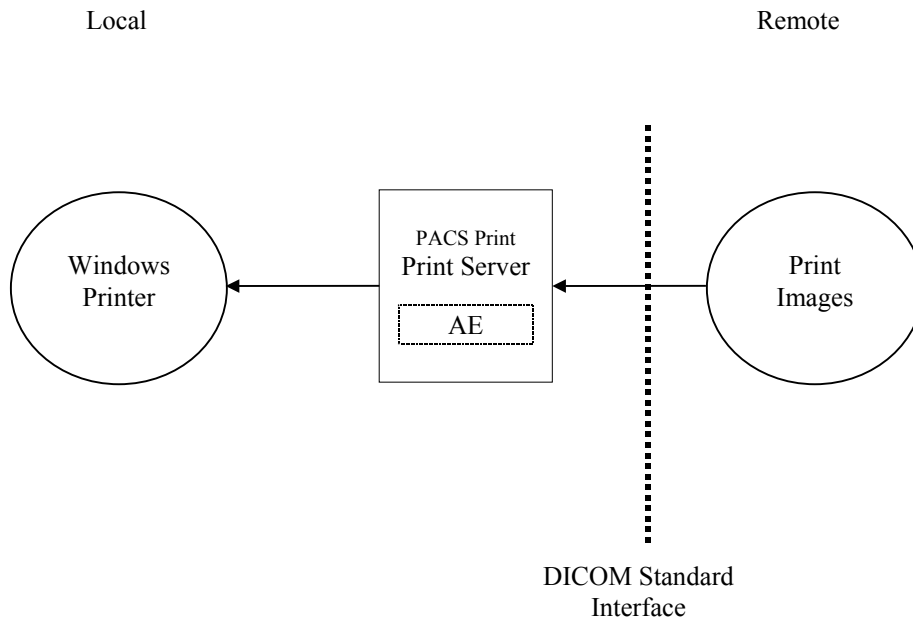
The following acronyms and abbreviations are used in this document.

- ACR American College of Radiology
- AE Application Entity
- ANSI American National Standards Institute
- DICOM Digital Imaging and Communications in Medicine
- DIMSE DICOM Message Service Element
- NEMA National Electrical Manufacturers Association
- PDU Protocol Data Unit
- SCP Service Class Provider
- SCU Service Class User
- SOP Service Object Pair
- TCP/IP Transmission Control Protocol/Internet Protocol
- UID Unique Identifier

1.3 Implementation Model

The PACS Print is a single Application Entity that provides the services of a DICOM Print Management Service Class. It accepts image data from Print Management Service Class Users and prints the images on a printer connected to the Windows PC.

1.4 Application Data Flow Diagram



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1.5 Functional Definitions of AEs

The PACS Print functions as an AE that acts as a SCP to provide DICOM Print Management Service Class support required for printing images received from one SCU. An SCU sends image data and print management requests as defined by DICOM.

The PACS Print AE functionality includes:

- Establishing DICOM associations
- Creating film sessions, film boxes, and image boxes
- Setting film session, film box, and image box attributes
- Printing film sessions and film boxes
- Deleting film sessions, film boxes, and image boxes
- Closing DICOM associations

1.6 Sequencing of Real-World Activities

Real world activities are sequenced as required to meet the definition of the Print Management Service Class. No additional sequencing activity is needed.

2.0 AE SPECIFICATION

2.1 PACS Print Application Entity Specification

The PACS Print provides Standard Conformance to the following DICOM V3.0 SOP Classes as a SCP:

SOP Class Name	SOP Class UID
Verification SOP Class	1.2.840.10008.1.1
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18

2.1.1 Association Establishment Policies

2.1.1.1 PDU Sizes

Maximum PDU size offered: 32,768 bytes
Maximum PDU size accepted: 2³² - 1 bytes

2.1.1.2 Number of Associations

The maximum number of simultaneous associations is six (6).

2.1.1.3 Asynchronous Nature

Multiple outstanding transactions are not supported. The AE does not use asynchronous operations window negotiation.

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2.1.1.4 Implementation Identifying Information

Implementation Class UID: 1.2.840.113742.4.20020826

Implementation Version Name: NAI 3.82

Notes: "113742" is registered by NAI Technology Products with ANSI. Implementation Class UID and Implementation Version Name are current as of the release date of this document and is subject to change as new versions of the PACS Print software are released.

2.1.2 Association Initiation by Real-World Activity

The AE is a SCP and never initiates associations.

2.1.3 Association Acceptance Policy

The PACS Print will always accept an association except when:

- the Called AE Title is not recognized. The association will be rejected with the reason 'called-AE-title-not-recognized'.
- the number of associations exceeds the maximum number of associations (see 2.1.1.2). The association will be rejected with the reason 'local-limit-exceeded'.

2.1.3.1 Acceptance of Print Management Associations

2.1.3.1.1 Associated Real World Activity

The PACS Print accepts associations for the purpose of printing images on hard copy medium as described in DICOM 3.0 PS 3.4 Annex H. These images are not for diagnostic use.

2.1.3.1.2 Presentation Context Table

The PACS Print supports the following presentation contexts.

Table 2.1.3.1.2-1

Presentation Context Table					
Abstract Syntax		Acceptable Transfer Syntaxes		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
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
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

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2.1.3.1.2.1 SOP Specific Conformance for Verification SOP Class

The PACS Print provides Standard Conformance to the Verification SOP Class as a SCP.

- C-ECHO

The C-ECHO DIMSE service is used to verify application level communications between DICOM AEs. The PACS Print responds to a C-ECHO request with the following status code:

Code	Status	Meaning
0x0000	Success	The C-ECHO request is accepted.

2.1.3.1.2.2 SOP Specific Conformance for Basic Grayscale Print Management Meta SOP Class

The PACS Print provides Standard Conformance to the Basic Grayscale Print Management Meta SOP Class as an SCP. This implies Standard Conformance for the following SOP classes.

SOP Class Name	SOP Class UID
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4
Printer SOP Class	1.2.840.10008.5.1.1.16

2.1.3.1.2.2.1 SOP Specific Conformance to Basic Film Session SOP Class

DICOM specified usage: M = Mandatory, U = User option

Supported DIMSE Services

NAME	USAGE	DESCRIPTION
N-Create	M	Creates an instance of the film session SOP class
N-Set	U	Updates attributes of a film session instance
N-Delete	U	Deletes an instance of the film session SOP class
N-Action	U	Prints all films belonging to a film session instance

The SCP will respond to all other DIMSE service requests with the status code:

Code	Status	Meaning
0x0211	Failure	Unrecognized operation

- N-CREATE

The N-CREATE DIMSE service is used by the SCU to create an instance of the Basic Film Session SOP Class. Only one Basic Film Session instance may exist at any one time per association. The following attributes are supported for an N-CREATE of a Basic Film Session Instance. If any element is missing or out of range, the default value will be used. No error status code will be returned.

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Supported SOP Class Elements

NAME	USAGE	RANGE	DESCRIPTION
Number of Copies	U	1 to 32767	Default is 1
Print Priority	U	HIGH MED LOW	Attribute ignored.
Medium Type	U	PAPER CLEAR FILM BLUE FILM	Attribute Ignored.
Film Destination	U	MAGAZINE PROCESSOR	Attribute Ignored.
Film Session Label	U	--	Attribute Ignored.
Memory Allocation	U	--	Attribute Ignored.

The SCP will return one of the following status codes for the N-CREATE operation:

Code	Status	Meaning
0x0000	Success	Instance has been successfully created
0x0210	Failure	Duplicate Invocation Returned if an attempt is made to create a second Basic Film Session Instance
0x0213	Failure	Resource Limitation Returned if the Memory Allocation request can not be satisfied, or the print queue is full

- N-SET

The N-SET DIMSE service is used by the SCU to update any or all of the attributes of an instance of the Basic Film Session SOP Class. If any element is missing or out of range, the default value will be used. No error status code will be returned. The SCP will return one of the following status codes for the N-SET operation.

Code	Status	Meaning
0x0000	Success	Instance attributes have been successfully updated
0x0112	Failure	No Such Object Instance Returned if an attempt is made to N-SET a non-existing instance
0x0213	Failure	Resource Limitation Returned if the Memory Allocation request can not be satisfied, or the print queue is full

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- **N-DELETE**

The N-DELETE DIMSE service is used by the SCU to delete an instance of the Basic Film Session SOP Class. The SCP will return one of the following status codes for the N-DELETE operation.

Code	Status	Meaning
0x0000	Success	Instance has been successfully deleted
0x0112	Failure	No Such Object Instance Returned if an attempt is made to N-DELETE a non-existing instance

- **N-ACTION**

The N-ACTION DIMSE service is used by the SCU to print an instance of the Basic Film Session SOP Class. All film boxes will be printed. Multiple copies will be collated. Maximum number of collated films is limited by print queue size. The SCP will return one of the following status codes for the N-ACTION operation.

Code	Status	Meaning
0x0000	Success	Instance has been successfully queued for printing
0x0112	Failure	No Such Object Instance Returned if an attempt is made to N-ACTION a non-existing instance
0xC601	Failure	Unable to create Print Job SOP instance; print queue is full

2.1.3.1.2.2.2 SOP Specific Conformance to Basic Film Box SOP Class

Supported DIMSE Services

NAME	USAGE	DESCRIPTION
N-Create	M	Creates an instance of the film box SOP Class
N-Set	U	Updates attributes of a film box
N-Delete	U	Deletes an instance of the film box SOP Class
N-Action	M	Prints an instance of the film box SOP Class

The SCP will respond to all other DIMSE service requests with the status code:

Code	Status	Meaning
0x0211	Failure	Unrecognized operation

- **N-CREATE**

The N-CREATE DIMSE service is used by the SCU to create an instance of the Basic Film Box SOP Class. The following attributes are supported for an N-CREATE of a Basic Film Box Instance. If any element is missing or out of range, the default value will be used. No error status code will be returned.

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Supported SOP Class Elements

NAME	USAGE	RANGE	DESCRIPTION
Image Display Format	M	STANDARD\1,1 STANDARD\1,2 STANDARD\2,1 STANDARD\2,2 STANDARD\2,3 STANDARD\3,2 STANDARD\3,3 STANDARD\3,4 STANDARD\3,5 STANDARD\4,3 STANDARD\4,4 STANDARD\4,5 STANDARD\4,6 STANDARD\5,3 STANDARD\5,4 STANDARD\5,6 STANDARD\6,5	
Referenced Film Session Sequence	M		
Referenced SOP Class UID	M	1.2.840.10008.5.1.1.1	Film Session SOP Class UID
Referenced SOP Instance UID	M		Referenced Film Session SOP
Film Orientation	U	PORTRAIT LANDSCAPE	Default is PORTRAIT
Film Size ID	U	8INX10IN 10INX12IN 10INX14IN 11INX14IN 11INX17IN 12INX18IN 14INX14IN 14INX17IN 24CMX24CM 24CMX30CM 35CMX35CM 35CMX43CM	Attribute Ignored. Paper size is determined by settings in the local Print Preferences.
Magnification Type	U	NONE REPLICATE BILINEAR CUBIC	REPLICATE maps to REPLICATE. NONE, CUBIC and BILINEAR map to BILINEAR. May be ignored if "Ignore Dicom Scale Tags" is selected.
Max Density	U	Limited by printer	Attribute Ignored.

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Configuration Information	U	string: CONTRAST=value CURVE=value WINDOW_WIDTH=value WINDOW_LEVEL=value WINDOW_CENTER=value	Attribute Ignored.
Annotation Display Format Id	U		Attribute Ignored.
Smoothing Type	U		Attribute Ignored.
Border Density	U	Dmin to Dmax, BLACK, WHITE	Attribute Ignored.
Empty Image Density	U	Dmin to Dmax, BLACK, WHITE	Attribute Ignored.
Min Density	U	Limited by printer	Attribute Ignored.
Trim	U	YES NO	Attribute Ignored.

The SCP will return one of the following status codes for the N-CREATE operation.

Code	Status	Meaning
0x0000	Success	Instance has been successfully created
0x0119	Failure	Class Instance Conflict Returned if the Referenced Film Session Instance does not exist
0x0213	Failure	Resource Limitation Returned if the print queue is full

- **N-SET**

The N-SET DIMSE service is used by the SCU to update attributes of an instance of the Basic Film Box SOP Class. The following attributes are supported for an N-SET of a Basic Film Box Instance. If any element is missing or out of range, the default value will be used. No error status code will be returned.

Supported SOP Class Elements

NAME	USAGE	RANGE	DESCRIPTION
Magnification Type	U	NONE REPLICATE BILINEAR CUBIC	REPLICATE maps to REPLICATE. NONE, CUBIC and BILINEAR map to BILINEAR. May be ignored if "Ignore Dicom Scale Tags" is selected.
Max Density	U	Limited by printer	Attribute Ignored.

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Configuration Information	U	string: CONTRAST=value CURVE=value WINDOW_WIDTH=value WINDOW_LEVEL=value WINDOW_CENTER=value	Attribute Ignored.
Smoothing Type	U		Attribute Ignored.
Border Density	U	Dmin to Dmax, BLACK, WHITE	Attribute Ignored.
Empty Image Density	U	Dmin to Dmax, BLACK, WHITE	Attribute Ignored.
Min Density	U	Limited by printer	Attribute Ignored.
Trim	U	YES NO	Attribute Ignored.

The SCP will return one of the following status codes for the N-SET operation.

Code	Status	Meaning
0x0000	Success	Instance attributes have been successfully updated
0x0112	Failure	No Such Object Instance Returned if an attempt is made to N-SET a non-existing instance

- **N-DELETE**

The N-DELETE DIMSE service is used by the SCU to delete an instance of the Basic Film Box SOP Class. The SCP will return one of the following status codes for the N-DELETE operation.

Code	Status	Meaning
0x0000	Success	Instance has been successfully deleted
0x0112	Failure	No Such Object Instance Returned if an attempt is made to N-DELETE a non-existing instance

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- N-ACTION

The N-ACTION DIMSE service is used by the SCU to print an instance of the Basic Film Box SOP Class. The SCP will return one of the following status codes for the N-ACTION operation.

Code	Status	Meaning
0x0000	Success	Instance has been successfully queued for printing
0x0112	Failure	No Such Object Instance Returned if an attempt is made to N-ACTION a non-existing instance
0xC602	Failure	Unable to create Print Job SOP instance; print queue is full

2.1.3.1.2.2.3 SOP Specific Conformance to Basic Grayscale Image Box SOP Class

Supported DIMSE Services

NAME	USAGE	DESCRIPTION
N-Set	M	An image box instance is created by the SCP for each potential image of the film box. Only the instances which will actually contain images will be updated with the N SET message.

The SCP will respond to all other DIMSE service requests with the status code:

Code	Status	Meaning
0x0211	Failure	Unrecognized operation

- N-SET

The N-SET DIMSE service is used by the SCU to update any or all of the attributes of an instance of the Basic Image Box SOP Class. If any element is missing or out of range, the default value will be used. No error status code will be returned.

Supported SOP Class Elements

NAME	USAGE	RANGE	DESCRIPTION
Image Position	M	1-n	Range limited by display format
Preformatted Grayscale Image Sequence	M		Used
Samples/pixel	M	1	Used
Photometric Interpretation	M	MONOCHROME1 MONOCHROME2	Used.
Rows	M	1-32767	Range may be limited by memory present on PC
Columns	M	1-32767	Range may be limited by memory present on PC
Pixel Aspect Ratio	M	1-32767/1-32767	row value/column value

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NAME	USAGE	RANGE	DESCRIPTION
Bits Allocated	M	8	Used
Bits Stored	M	8	Used
High bit	M	7	Bit is MSB
Pixel Representation	M	0	Unsigned pixel values
Pixel Data	M		gray pixel data
Polarity	U	NORMAL REVERSE	Used, Default Normal
Referenced Overlay Sequence	U		Attribute Ignored.
>SOP Class UID	U		Attribute Ignored.
>SOP Instance UID	U		Attribute Ignored.
Magnification Type	U		Attribute Ignored.
Smoothing Type	U		Attribute Ignored.
Requested Image Size	U		Attribute Ignored.

The SCP will return one of the following status codes for the N-SET operation.

Code	Status	Meaning
0x0000	Success	Instance attributes have been successfully updated
0x0112	Failure	No Such Object Instance Returned if an attempt is made to N-SET a non-existing instance
0xC603	Failure	Returned if greater than 8 bit image data is sent.
0xC605	Failure	Insufficient memory to store image

2.1.3.1.2.3 SOP Specific Conformance for Basic Color Print Management Meta SOP Class

The PACS Print provides Standard Conformance to the Basic Grayscale Print Management Meta SOP Class as a SCP. This implies Standard Conformance for the following SOP classes.

SOP Class Name	SOP Class UID
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1
Printer SOP Class	1.2.840.10008.5.1.1.16

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2.1.3.1.2.3.1 SOP Specific Conformance to Basic Film Session SOP Class

DICOM specified usage: M = Mandatory, U = User option

Supported DIMSE Services

NAME	USAGE	DESCRIPTION
N-Create	M	Creates an instance of the film session SOP class
N-Set	U	Updates attributes of a film session instance
N-Delete	U	Deletes an instance of the film session SOP class
N-Action	U	Prints all films belonging to a film session instance

The SCP will respond to all other DIMSE service requests with the status code:

Code	Status	Meaning
0x0211	Failure	Unrecognized operation

- **N-CREATE**

The N-CREATE DIMSE service is used by the SCU to create an instance of the Basic Film Session SOP Class. Only one Basic Film Session instance may exist at any one time per association. The following attributes are supported for an N-CREATE of a Basic Film Session Instance. If any element is missing or out of range, the default value will be used. No error status code will be returned.

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Supported SOP Class Elements

NAME	USAGE	RANGE	DESCRIPTION
Number of Copies	U	1 to 32767	Default is 1
Print Priority	U	HIGH MED LOW	Attribute ignored.
Medium Type	U	PAPER CLEAR FILM BLUE FILM	Attribute Ignored.
Film Destination	U	MAGAZINE PROCESSOR	Attribute Ignored.
Film Session Label	U	--	Attribute Ignored.
Memory Allocation	U	--	Attribute Ignored.

The SCP will return one of the following status codes for the N-CREATE operation:

Code	Status	Meaning
0x0000	Success	Instance has been successfully created
0x0210	Failure	Duplicate Invocation Returned if an attempt is made to create a second Basic Film Session Instance
0x0213	Failure	Resource Limitation Returned if the Memory Allocation request can not be satisfied, or the print queue is full

- N-SET

The N-SET DIMSE service is used by the SCU to update any or all of the attributes of an instance of the Basic Film Session SOP Class. If any element is missing or out of range, the default value will be used. No error status code will be returned. The SCP will return one of the following status codes for the N-SET operation.

Code	Status	Meaning
0x0000	Success	Instance attributes have been successfully updated
0x0112	Failure	No Such Object Instance Returned if an attempt is made to N-SET a non-existing instance
0x0213	Failure	Resource Limitation Returned if the Memory Allocation request can not be satisfied, or the print queue is full

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- **N-DELETE**

The N-DELETE DIMSE service is used by the SCU to delete an instance of the Basic Film Session SOP Class. The SCP will return one of the following status codes for the N-DELETE operation.

Code	Status	Meaning
0x0000	Success	Instance has been successfully deleted
0x0112	Failure	No Such Object Instance Returned if an attempt is made to N-DELETE a non-existing instance

- **N-ACTION**

The N-ACTION DIMSE service is used by the SCU to print an instance of the Basic Film Session SOP Class. All film boxes will be printed. Multiple copies will be collated. Maximum number of collated films is limited by print queue size. The SCP will return one of the following status codes for the N-ACTION operation.

Code	Status	Meaning
0x0000	Success	Instance has been successfully queued for printing
0x0112	Failure	No Such Object Instance Returned if an attempt is made to N-ACTION a non-existing instance
0xC601	Failure	Unable to create Print Job SOP instance; print queue is full

2.1.3.1.2.3.2 SOP Specific Conformance to Basic Film Box SOP Class

Supported DIMSE Services

NAME	USAGE	DESCRIPTION
N-Create	M	Creates an instance of the film box SOP Class
N-Set	U	Updates attributes of a film box
N-Delete	U	Deletes an instance of the film box SOP Class
N-Action	M	Prints an instance of the film box SOP Class

The SCP will respond to all other DIMSE service requests with the status code:

Code	Status	Meaning
0x0211	Failure	Unrecognized operation

- **N-CREATE**

The N-CREATE DIMSE service is used by the SCU to create an instance of the Basic Film Box SOP Class. The following attributes are supported for an N-CREATE of a Basic Film Box Instance. If any element is missing or out of range, the default value will be used. No error status code will be returned.

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Supported SOP Class Elements

NAME	USAGE	RANGE	DESCRIPTION
Image Display Format	M	STANDARD\1,1 STANDARD\1,2 STANDARD\2,1 STANDARD\2,2 STANDARD\2,3 STANDARD\3,2 STANDARD\3,3 STANDARD\3,4 STANDARD\3,5 STANDARD\4,3 STANDARD\4,4 STANDARD\4,5 STANDARD\4,6 STANDARD\5,3 STANDARD\5,4 STANDARD\5,6 STANDARD\6,5	
Referenced Film Session Sequence	M		
Referenced SOP Class UID	M	1.2.840.10008.5.1.1.1	Film Session SOP Class UID
Referenced SOP Instance UID	M		Referenced Film Session SOP
Film Orientation	U	PORTRAIT LANDSCAPE	Default is PORTRAIT
Film Size ID	U	8INX10IN 10INX12IN 10INX14IN 11INX14IN 11INX17IN 12INX18IN 14INX14IN 14INX17IN 24CMX24CM 24CMX30CM 35CMX35CM 35CMX43CM	Attribute Ignored. Paper size is determined by settings in the local Print Preferences.
Magnification Type	U	NONE REPLICATE BILINEAR CUBIC	REPLICATE maps to REPLICATE. NONE, CUBIC and BILINEAR map to BILINEAR. May be ignored if "Ignore Dicom Scale Tags" is selected.
Max Density	U	Limited by printer	Attribute Ignored.

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Configuration Information	U	string: CONTRAST=value CURVE=value WINDOW_WIDTH=value WINDOW_LEVEL=value WINDOW_CENTER=value	Attribute Ignored.
Annotation Display Format Id	U		Attribute Ignored.
Smoothing Type	U		Attribute Ignored.
Border Density	U	Dmin to Dmax, BLACK, WHITE	Attribute Ignored.
Empty Image Density	U	Dmin to Dmax, BLACK, WHITE	Attribute Ignored.
Min Density	U	Limited by printer	Attribute Ignored.
Trim	U	YES NO	Attribute Ignored.

The SCP will return one of the following status codes for the N-CREATE operation.

Code	Status	Meaning
0x0000	Success	Instance has been successfully created
0x0119	Failure	Class Instance Conflict Returned if the Referenced Film Session Instance does not exist
0x0213	Failure	Resource Limitation Returned if the print queue is full

- **N-SET**

The N-SET DIMSE service is used by the SCU to update attributes of an instance of the Basic Film Box SOP Class. The following attributes are supported for an N-SET of a Basic Film Box Instance. If any element is missing or out of range, the default value will be used. No error status code will be returned.

Supported SOP Class Elements

NAME	USAGE	RANGE	DESCRIPTION
Magnification Type	U	NONE REPLICATE BILINEAR CUBIC	REPLICATE maps to REPLICATE. NONE, CUBIC and BILINEAR map to BILINEAR. May be ignored if "Ignore Dicom Scale Tags" is selected.
Max Density	U	Limited by printer	Attribute Ignored.

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Configuration Information	U	string: CONTRAST=value CURVE=value WINDOW_WIDTH=value WINDOW_LEVEL=value WINDOW_CENTER=value	Attribute Ignored.
Smoothing Type	U		Attribute Ignored.
Border Density	U	Dmin to Dmax, BLACK, WHITE	Attribute Ignored.
Empty Image Density	U	Dmin to Dmax, BLACK, WHITE	Attribute Ignored.
Min Density	U	Limited by printer	Attribute Ignored.
Trim	U	YES NO	Attribute Ignored.

The SCP will return one of the following status codes for the N-SET operation.

Code	Status	Meaning
0x0000	Success	Instance attributes have been successfully updated
0x0112	Failure	No Such Object Instance Returned if an attempt is made to N-SET a non-existing instance

- **N-DELETE**

The N-DELETE DIMSE service is used by the SCU to delete an instance of the Basic Film Box SOP Class. The SCP will return one of the following status codes for the N-DELETE operation.

Code	Status	Meaning
0x0000	Success	Instance has been successfully deleted
0x0112	Failure	No Such Object Instance Returned if an attempt is made to N-DELETE a non-existing instance

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- N-ACTION

The N-ACTION DIMSE service is used by the SCU to print an instance of the Basic Film Box SOP Class. The SCP will return one of the following status codes for the N-ACTION operation.

Code	Status	Meaning
0x0000	Success	Instance has been successfully queued for printing
0x0112	Failure	No Such Object Instance Returned if an attempt is made to N-ACTION a non-existing instance
0xC602	Failure	Unable to create Print Job SOP instance; print queue is full

2.1.3.1.2.3.3 SOP Specific Conformance to Basic Color Image Box SOP Class

Supported DIMSE Services

NAME	USAGE	DESCRIPTION
N-Set	M	An image box instance is created by the SCP for each potential image of the film box. Only the instances which will actually contain images will be updated with the N SET message.

The SCP will respond to all other DIMSE service requests with the status code:

Code	Status	Meaning
0x0211	Failure	Unrecognized operation

- N-SET

The N-SET DIMSE service is used by the SCU to update any or all of the attributes of an instance of the Basic Image Box SOP Class. If any element is missing or out of range, the default value will be used. No error status code will be returned.

Supported SOP Class Elements

NAME	USAGE	RANGE	DESCRIPTION
Image Position	M	1-n	Range limited by display format
Preformatted Color Image Sequence	M		Used
Samples/pixel	M	3	Used
Planar Configuration	M	0 - color by pixel 1 - color by plane	Pixel configuration.
Photometric Interpretation	M	RGB	Only RGB recognized.
Rows	M	1-32767	Range may be limited by memory present on PC
Columns	M	1-32767	Range may be limited by

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NAME	USAGE	RANGE	DESCRIPTION
			memory present on PC
Pixel Aspect Ratio	M	1-32767/1-32767	row value/column value
Bits Allocated	M	8	Used
Bits Stored	M	8	Used
High bit	M	7	Bit is MSB
Pixel Representation	M	0	Unsigned pixel values
Pixel Data	M		color pixel data
Referenced Overlay Sequence	U		Attribute Ignored.
>SOP Class UID	U		Attribute Ignored.
>SOP Instance UID	U		Attribute Ignored.
Magnification Type	U		Attribute Ignored.
Smoothing Type	U		Attribute Ignored.
Requested Image Size	U		Attribute Ignored.

The SCP will return one of the following status codes for the N-SET operation.

Code	Status	Meaning
0x0000	Success	Instance attributes have been successfully updated
0x0112	Failure	No Such Object Instance Returned if an attempt is made to N-SET a non-existing instance
0xC603	Failure	Returned if greater than 8 bit image data is sent.
0xC605	Failure	Insufficient memory to store image

2.1.3.1.3 Presentation Context Acceptance Criterion

Any combination of Abstract Syntax and Transfer Syntax from Table 2.1.3.1.2-1 is acceptable.

2.1.3.1.4 Selection of Transfer Syntax

If more than one Transfer Syntax is proposed within a presentation context, the following table shows the preference order that governs the selection.

Selection Preference	Transfer Syntaxes	
	Name List	UID List
Highest	Implicit VR Little Endian	1.2.840.10008.1.2
Medium	Explicit VR Little Endian	1.2.840.10008.1.2.1
Lowest	Explicit VR Big Endian	1.2.840.10008.1.2.2

3.0 COMMUNICATION PROFILES

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3.1 TCP/IP Stack Supported

The TCP/IP protocol is used.

Port address used will be the constant, 104, the "well known" TCP/IP port for DICOM.

Networking is dependant on the installed network adaptor and drivers supported by the Windows operating system.

3.2 Physical Media Supported

Dependant on installed network adaptor.

4.0 EXTENSIONS/SPECIALIZATIONS/PRIVATIZATIONS

4.1 Standard Extended/Specialized/Private SOPs

None.

4.2 Private Transfer Syntax's

None

5.0 CONFIGURATION

This device obtains configuration information at the time of installation to provide device configuration information

5.1 AE Title/Presentation Address Mapping

The translation from AE Title to Presentation Address is to be performed using a look up table loaded at installation or some other time.

5.2 Configurable Parameters

A lookup table will contain the following configuration parameters:

- Number of Application Entities
- SCP Application Entity Title
- IP Address
- Association Timeout Period
- SCU parameter defaults
- SCU parameter overrides

6.0 SUPPORT OF EXTENDED CHARACTER SETS

Extended character sets are not supported.