PHILIPS

DICOM 3.0
CONFORMANCE
STATEMENT

JET*Stream*® Workspace

Version 1.0

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The JET*Stream®* Workspace DICOM software is in compliance with the ACR-NEMA DICOM 3.0 standard; however, due to the inherent nature of DICOM, the user must perform acceptance testing to verify that the JET*Stream®* Workspace DICOM software meets the requirements for your configuration. The acceptance testing must include all representative datasets (images) that you intend to transfer, all types of transfers desired for a type of dataset, and clinical evaluation of each representative dataset on the receiving end after each desired type of transfer.

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INTRODUCTION

Scope

This document states the conformance of the JET*Stream*® Workspace product to DICOM 3.0 standard. It only applies to the JET*Stream*® Workspace DICOM software version 1.0 or higher. The DICOM conformance of other medical devices manufactured by Philips Medical Systems is detailed in separate documents.

Important Notes

The JET*Stream*® Workspace DICOM software is in compliance with ACR-NEMA DICOM 3.0 standard; however, due to the inherent nature of DICOM, the user must perform acceptance testing to verify that the JET*Stream*® Workspace DICOM software meets requirements for their configuration.

The acceptance testing should include all representative datasets (images) that the user intends to transfer, all types of transfers desired for a type of dataset, and clinical evaluation of each representative dataset on the receiving end after the transfer of the desired type. Please read the following sections carefully prior to using any of the DICOM software products.

Why Conformance Statement

DICOM 3.0 standard enables vendors to implement systems in such a way that an imaging device can exchange patient and image data with another imaging device of the same or different modality, a Radiology Information System (RIS), a Hospital Information System (HIS), a Review/PACS station, an Archive or Hardcopy device over a standard network. It also permits data exchange via removable media, such as a Magneto-Optical disk, and through DICOM proprietary 50-pin point-to-point physical connection. As of the NEMA printing in 1993, DICOM 3.0 standard supports at least five diagnostic imaging modalities, i.e., CT, MRI, Nuclear Medicine, Ultrasound, Digital/Computed Radiography and PET.

Because of the broadness and extensibility of the DICOM standard, each DICOM conforming system would normally support only a subset of DICOM 3.0. Each pair of

DICOM peer devices, or Application Entities (AE), can only communicate over the intersection of commonly supported parts of DICOM. Fortunately, DICOM 3.0 standard requires some minimum conformance.

This conformance statement can help the user understand the level of connectivity between JET*Stream*® Workspace and other DICOM compatible devices.   This conformance statement is written in accordance with Part 2 of DICOM, NEMA Standards Publication No. PS3.2 - 1993. It is assumed that readers of this document are familiar with the DICOM standard and with the terminology and concepts used in that standard.

IMPLEMENTATION MODEL

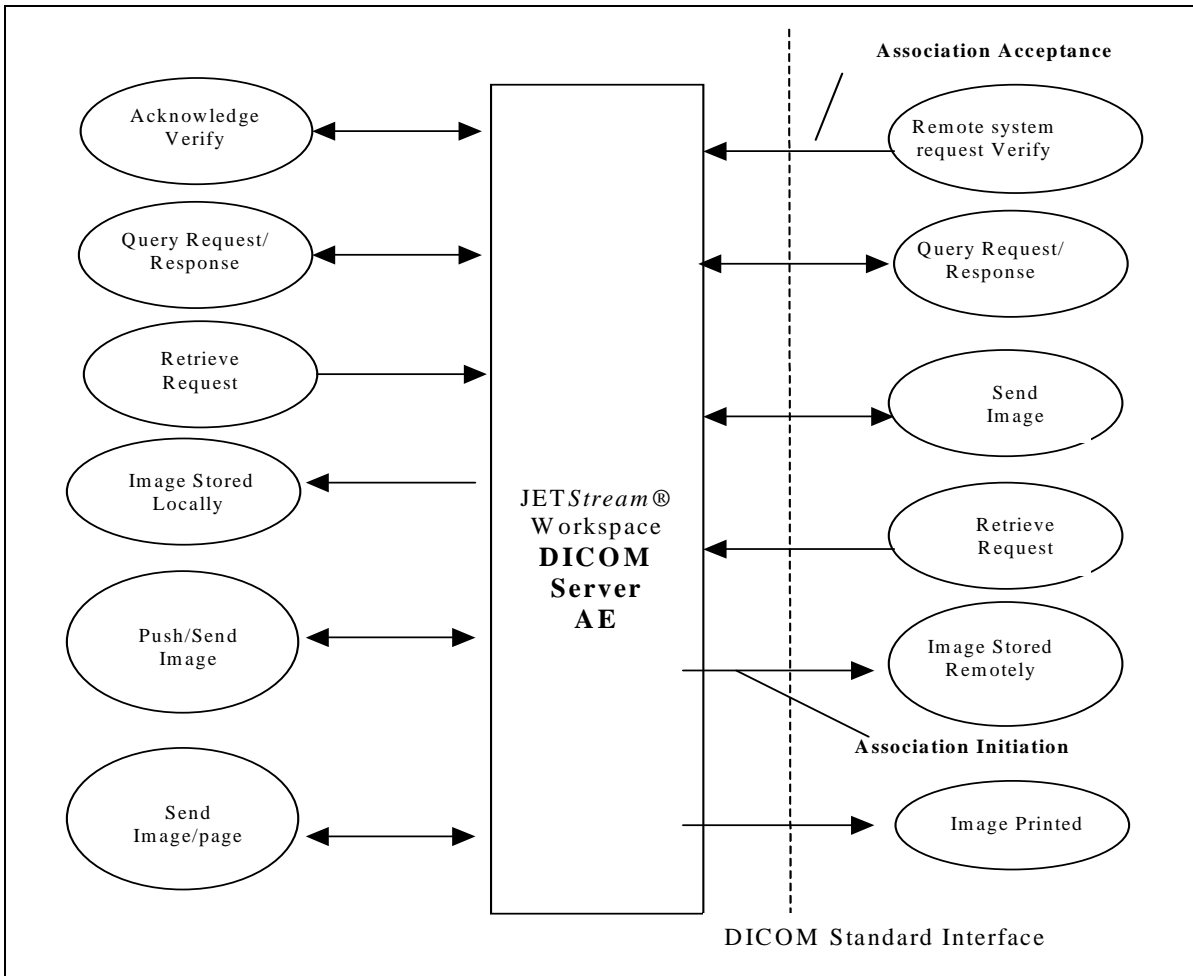## Application Data Flow Diagram For CStore, Query/Retrive & Print

Figure 1: JET*Stream*® Workspace DICOM Server AE
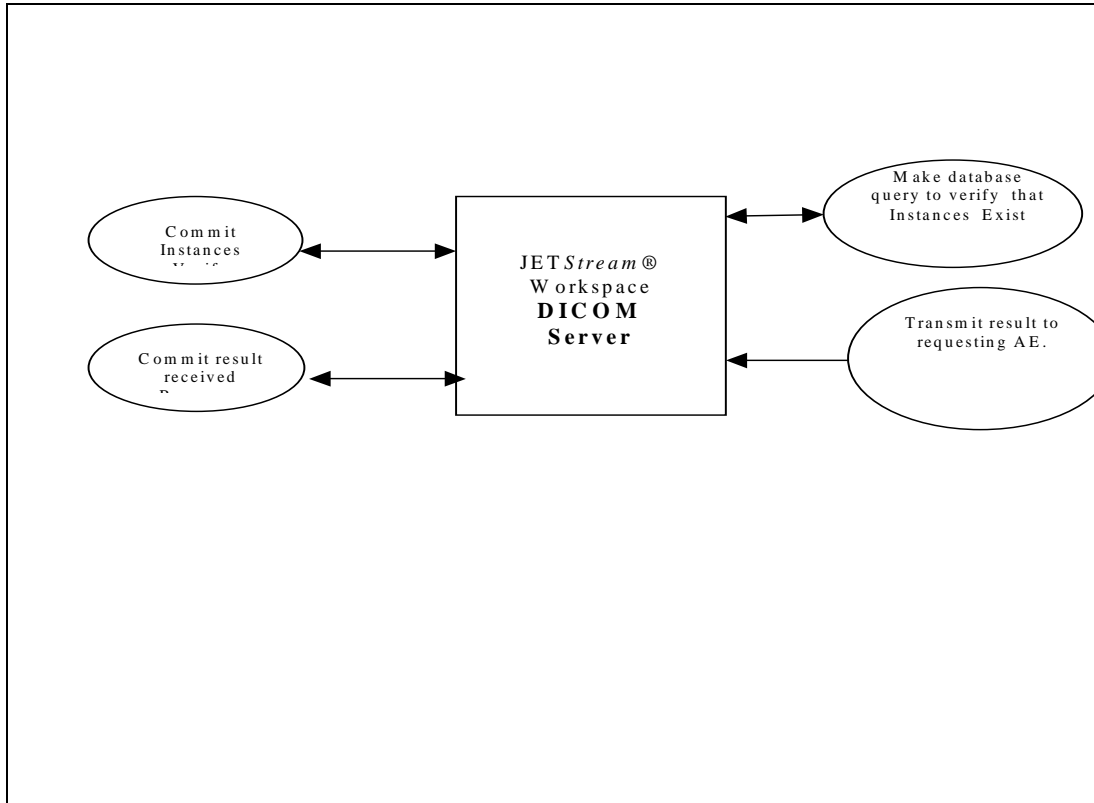
Application Data Flow Diagram For Storage commit

Figure 2: JET*Stream*® Workspace DICOM Server AE(Storage commit)

Functional Definitions of AE's

The JET*Stream*® Workspace DICOM server AE (Figure1) illustrates the full DICOM option supported by JET*Stream*® Workspace. This AE is started when the main JET*Stream*® Workspace Application is started. The DICOM Server is listening indefinitely on a predefined port, which is terminated when the main application is stopped.

The DICOM Server AE is able to establish a DICOM Association with any remote host, which supports the DICOM Verify, Storage, Query-Retrieve and Print Management Service Classes. This AE is able to acknowledge and establish a DICOM Association initiated by a remote server for DICOM Verify, Storage and Query Retrieve Services only.

All the images received by this entity, either by way of DICOM Query-Retrieve Service class or by way of an independent Storage request by the remote host, is stored in the JET*Stream*® Workspace Local Database.

Any remote server can query the JET*Stream*® Workspace Local Database using DICOM Query-Retrieve Service Class. The images stored in the Local Database can also be pushed to the configured DICOM host using the DICOM Storage Service Class.

JET*Stream*® Workspace can send the results/report "page" created by the application to the DICOM printer. The DICOM printer can be configured via the tray icon.

JET*Stream*® Workspace can act as Storage commitment SCP and SCU.

Sequencing of Real-Word Activities

Not Applicable.

AE SPECIFICATIONS

The JET*Stream*® Workspace DICOM Server AE provides standard conformance to the following DICOM V3.0 SOP classes in the SCU and SCP role:

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Nuclear Medicine Image Information Object -Storage	1.2.840.10008.5.1.4.1.1.20
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Digital X-Ray Image Storage	1.2.840.10008.5.1.4.1.1.1.1
Ultra Sound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
Query/Retrieve Study Root FIND	1.2.840.10008.5.1.4.1.2.2.1
Query/Retrieve Study Root MOVE	1.2.840.10008.5.1.4.1.2.2.2

The JET*Stream*® Workspace DICOM AE provides standard conformance to the following DICOM V3.0 SOP Class in the SCU role:

SOP Class Name	SOP Class UID
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

Association Establishment Policies

General

The JET*Stream*® Workspace DICOM AE can initiate and/or accept DICOM association only under the standard DICOM Application Context Name (ACN):

| Application Context Name | 1.2.840.10008.3.1.1.1 |

Number of Associations

The number of simultaneous associations that will be accepted by JET*Stream*® Workspace DICOM server is configurable. However, the default is 2 and it is recommended not to exceed more than 10 connections.

Asynchronous Nature

Not Applicable

Implementation Identifying Information

The AE Title used by the JET*Stream*® Workspace DICOM Server is set in a configuration file. The AE Title, by default is "JETSPHERE"

The JET*Stream*® Workspace DICOM Server uses an implementation UID identifying the different DICOM services it supports.

| Implementation UID | 1.2.840.116519.1.0.1 |

Association Initiation Policy

The JET*Stream*® Workspace DICOM Server initiates the establishment of DICOM association to issue the following DICOM requests:

- Verification (C-Echo)
- Storage (C-STORE)
- Query (C-FIND)
- Retrieve (C-MOVE)
- Print (N-Create, N-Action, N-Get, N-Delete, N-Set)

Associated Real-Word Activity

The JET*Stream*® Workspace DICOM Server User can verify the existence of the remote DICOM Server by sending a C-Echo request on a successful established Association. The user also initiates the establishment of an Association when a particular image from the local database is to be transferred to the remote host. JET*Stream*® Workspace DICOM Server also initiates the opening of the Association when the user issues a query/retrieve request to the remote database. Finally, the

server also initiates the opening of the Association with a DICOM printer when invoked by the user to print the images.

Presentation context table

The JET*Stream® Workspace* DICOM server will propose a single Presentation Context for the Association as defined by Table 1:

Presentation context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Nuclear Medicine Image	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Nuclear Medicine Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Nuclear Medicine Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Study Root FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Study Root Move	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Grayscale Print Management	1.2.840.10008.5.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Color Print Management	1.2.840.10008.5.1.1.18	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

Table 1: Proposed Presentation Context

SOP Specific Conformance to Basic Grayscale Print Management Meta SOP Class

JET*Stream® Workspace* DICOM print server supports the following mandatory SOP classes, which are defined under the Basic Grayscale Print Management Meta SOP Class:

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	1.2.840.10008.5.1.1.14

SOP Specific Conformance to Basic Color Print Management Meta SOP Class

JET*Stream®* Workspace DICOM print server supports the following mandatory SOP classes which are defined under the Basic Color Print Management Meta SOP Class:

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	1.2.840.10008.5.1.1.14

SOP Specific Conformance

JET*Stream®* Workspace conforms to the definition of an SCU of the Verification SOP Class in accordance with the DICOM Standard.

JET*Stream®* Workspace as an SCU of the Storage SOP Class enables the transfer of images, including secondary capture from its local database to the selected remote host. Any unsuccessful is reported and no action is taken upon the receipt of a C-STORE successful message or warning response status.

The JET*Stream®* Workspace DICOM Server conforms to the definition of an SCU of the Query (C-FIND) and Retrieve (C-Move) Service in accordance with the DICOM standard. JET*Stream®* Workspace supports queries against the Study Root Information Model. JET*Stream®* Workspace can send queries at Study, Series and Image Level in the Study Root FIND SOP Class.

JET*Stream®* Workspace can also send a Retrieve (C-MOVE) request in the SCU role requesting the remote host to transfer a particular Image. All the images received in entirety will be updated and mapped to the JET*Stream®* Workspace Local database and a successful C-STORE message sent to the requester. However, if the image cannot be received properly due to insufficient disk space or other protocol errors, JET*Stream®* Workspace sends back an unsuccessful C-STORE message.

JET*Stream®* Workspace can send the bitmap (bmp) file created by the application to the DICOM printer using the N-Set, N-Create, N-Get, N-Delete and N-Action services. The N-Get service is used to get the printer parameters while N-Create service is used to create the Film Session and Film Box. N-Set service is used to set the Image Box and N-action to print the images. Finally N-Delete service is used to delete the print object/instance on the printer.

JET*Stream*® Workspace can act as Storage commitment SCP and SCU. In the case of SCP it receives commit request (in the form of N-ACTION) and process it. If the request is valid, it will build the N-EVENT –REPORT based on the commit status and will transmit the result in the same association. In the case of SCU, it will receive the REPORT and will update commit information as appropriate.

Association Acceptance Policy

The JET*Stream*® Workspace DICOM server accepts an association to acknowledge the DICOM Verify (C-Echo) service, to respond to the DICOM Query (C-FIND) Service, to respond to Retrieve (C-MOVE) Service. JET*Stream*® Workspace also accepts an association to receive (C-STORE) the images sent from the remote host.

Associated Real-Word Activity

The JET*Stream*® Workspace DICOM Server will acknowledge and establish an Association whenever any remote DICOM server wants to verify its existence and transfer some images using the standard DICOM C-STORE request. JET*Stream*® Workspace will also accept Association to service the query/retrieve requests against its local database.

Presentation context table

The Presentation Context accepted by JET*Stream*® Workspace DICOM server, while trying to acknowledge the establishment of the Association, are shown in Table 2.

Presentation context table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name**	**UID**		**Negotiation**
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Nuclear Medicine Image	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Nuclear Medicine Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Nuclear Medicine Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

Study Root FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Study Root Move	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

Table 2: Acceptable Presentation Context.

SOP Specific Conformance

JET*Stream*® Workspace DICOM Server conforms to the definition of a SCP of the Verification SOP Class in accordance with the DICOM Standard.

JET*Stream*® Workspace DICOM server provides standard conformance to the DICOM Storage Service Class in the SCP role. All the images received in entirety will be updated and mapped to the JET*Stream*® Workspace Local database, with the restriction that elements having no mapping in JET*Stream*® Workspace patient database are discarded. However, if the image cannot be received properly due to insufficient disk space or other protocol errors, JET*Stream*® Workspace sends back an unsuccessful C-STORE message.

Presentation Context Acceptance Criterion

JET*Stream*® Workspace DICOM server accepts Presentation Contexts specified in Table 2.

It examines proposed Presentation Contexts in the order proposed. The first acceptable Presentation Context determines the Abstract Syntax, which will be used for association, as well as the transfer syntax that will be used.

Transfer Syntax Selection Policies

JET*Stream*® Workspace accepts the transfer syntax in the order they are proposed. By default, however, the DICOM default Transfer Syntax is accepted.

COMMUNICATION PROFILES

Supported Communication Stacks

JET*Stream*® Workspace DICOM server implementation provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM standard.

TCP/IP Stack

JET*Stream*® Workspace DICOM server implementation is indifferent to the physical medium over which TCP/IP executes.

EXTENSION/SPECIALIZATION/PRIVATIZATION

There is no Extension, Specialization nor Privatization in JET*Stream®* Workspace DICOM server implementation.

CONFIGURATION

JET*Stream®* Workspace DICOM server fetches the serving port number and the AE title from JET*Stream®* Workspace configuration files. However, these parameters are modify-able by the user from the Tray Icon. The total number of simultaneous Associations acceptable is also configurable from this Tray Icon.

SUPPORT OF EXTENDED CHARACTER SETS

Extended character sets are not supported by the current implementation.