DICOM

Conformance Statement

BV Family
Software Release 1.5
System Release 1.2

PHILIPS

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1. DICOM CONFORMANCE STATEMENT OVERVIEW

The BV Family system of Philips Medical Systems is a mobile image generating system. The BV Family system is installed with an Export function based on the DICOM Image Storage to transfer image data from the system to a remote system and a DICOM print function to print image data.

The BV Family system provides the following DICOM data exchange features:

- It allows the operator to print images stored in the database on a DICOM printer (Standard DICOM package).
- It allows the operator to store images stored in the database to a DICOM destination (Standard DICOM package).
- After storing images it will send a storage commitment request automatically (Advanced DICOM package).
- It allows the operator to request a DICOM Modality Worklist from an external provider (Advanced DICOM package).
- It can send DICOM Modality Performed Procedure Step information to an external provider (Advanced DICOM package).

Figure 1. BV Family system in a DICOM Network

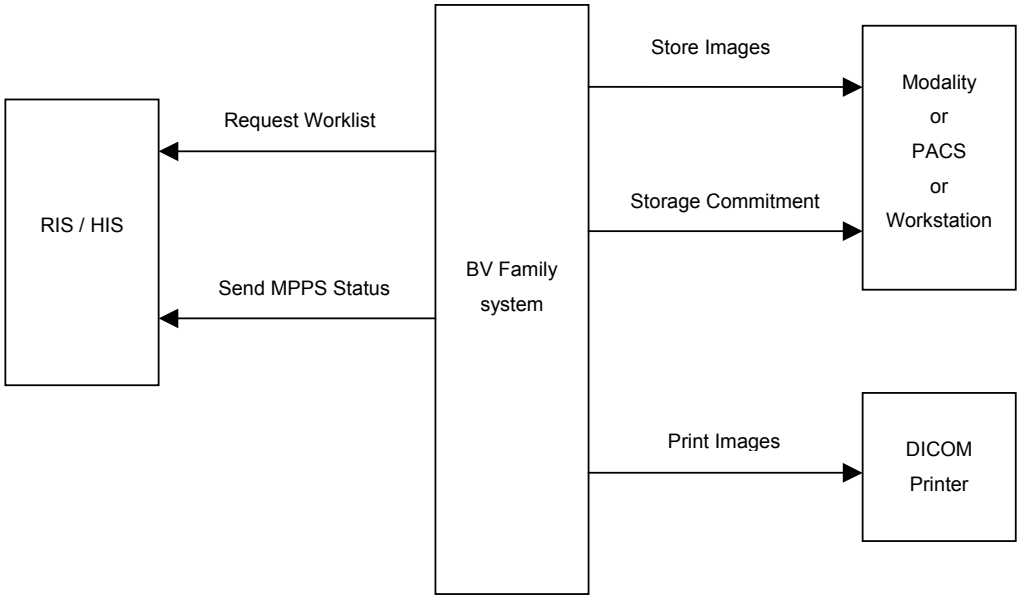

Table 1 provides an overview of all network services and the applicable SOP classes as provided by the BV Family system.

Table 1. Network Services

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Image Transfer		
X-Ray Angiographic Image Storage	Yes	No
Secondary Capture Image Storage	Yes	No
Workflow Management		
Storage Commitment Push Model	Yes	No
Modality Worklist Management	Yes	No
Modality Performed Procedure Step	Yes	No
Print Management		
Basic Grayscale Print Management (Meta)	Yes	No
> Basic Film Session	Yes	No
> Basic Film Box	Yes	No
> Basic Grayscale Image Box	Yes	No
> Printer	Yes	No

2. TABLE OF CONTENTS

3. INTRODUCTION

3.1. Revision History

The revision history provides dates and differences of the different releases.

TABLE 2. Revision History

Document Version	Date of Issue	Author	Description
00	22 January 2004	PMS MIT-IO	Preliminary version of the DICOM Conformance Statement for BV Family Release 1.5
01	01 June 2004	PMS MIT-IO	Final version of the DICOM Conformance Statement for BV Family Release 1.5 after Review meeting.

3.2. Audience

This Conformance Statement is intended for:

- (potential) customers
- system integrators of medical equipment
- marketing staff interested in system functionality
- software designers implementing DICOM interfaces

It is assumed that the reader is familiar with the DICOM standard.

3.3. Remarks

The DICOM Conformance Statement is contained in chapter 4 through 8 and follows the contents and structuring requirements of DICOM PS 3.2-2003.

This DICOM Conformance Statement by itself does not guarantee successful interoperability of Philips equipment with non-Philips equipment. The user (or user's agent) should be aware of the following issues:

- **Interoperability**
  Interoperability refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into an IT environment may require application functions that are not specified within the scope of DICOM. Consequently, using only the information provided by this Conformance Statement does not guarantee interoperability of Philips equipment with non-Philips equipment.
  It is the user's responsibility to analyze thoroughly the application requirements and to specify a solution that integrates this equipment with other Philips and non-Philips equipment.

- **Validation**
  Philips equipment has been carefully tested to assure that the actual implementation of the DICOM interface corresponds with this Conformance Statement.
  Where Philips equipment is linked to non-Philips equipment, the first step is to compare the relevant Conformance Statements. If the Conformance Statements indicate that successful information exchange should be possible, additional validation tests will be necessary to ensure the functionality, performance, accuracy and stability of image and image related data. It is the

responsibility of the user (or user's agent) to specify the appropriate test suite and to carry out the additional validation tests.

- **New versions of the DICOM Standard**
  The DICOM Standard will evolve in future to meet the user's growing requirements and to incorporate new features and technologies. Philips is actively involved in this evolution and plans to adapt its equipment to future versions of the DICOM Standard. In order to do so, Philips reserves the right to make changes to its products or to discontinue its delivery.
  The user should ensure that any non-Philips provider linking to Philips equipment also adapts to future versions of the DICOM Standard. If not, the incorporation of DICOM enhancements into Philips equipment may lead to loss of connectivity (in case of networking) and incompatibility (in case of media).

3.4. Definitions, Terms and Abbreviations

DICOM definitions, terms and abbreviations are used throughout this Conformance Statement. For a description of these, see NEMA PS 3.3-2003 and PS 3.4-2003. The word Philips in this document refers to Philips Medical Systems.

The following acronyms and abbreviations are used in this document.

ACC	American College of Cardiology
AE	Application Entity
ACR	American College of Radiology
ANSI	American National Standard Institute
DICOM	Digital Imaging and Communication in Medicine
DIMSE	DICOM Message Service Element
DIMSE-C	DICOM Message Service Element-Composite
DIMSE-N	DICOM Message Service Element-Normalized
ELE	Explicit VR Little Endian
EBE	Explicit VR Big Endian
GUI	Graphic User Interface
HIS	Hospital Information System
HL7	Health Level Seven
ILE	Implicit VR Little Endian
IOD	Information Object Definition
MPPS	Modality Performed Procedure Step
NEMA	National Electrical Manufacturers Association
PDU	Protocol Data Unit
RIS	Radiology Information System
RWA	Real World Activity
SC	Secondary Capture
SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair
TCP/IP	Transmission Control Protocol/Internet protocol
UID	Unique Identifier
MWL	Modality Worklist Management

3.5. References

[DICOM] Digital Imaging and Communications in Medicine (DICOM), Part 1 – 16 (NEMA PS 3.1-2003 – PS 3.16-2003),
National Electrical Manufacturers Association (NEMA)

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4. NETWORKING

This section contains the networking related services (vs. the media related ones).

4.1. Implementation model

The implementation model consists of three sections:
- The Application Data Flow Diagram, specifying the relationship between the BV Family Application Entity and the "external world" or Real-World activities,
- a functional description of the BV Family Application Entity, and
- the sequencing constraints among them.

4.1.1. Application Data Flow

The BV Family system defines one DICOM Application Entity (BV Family AE) with up to five basic functions. Two versions are possible:

- Standard DICOM package: In this minimum configuration only DICOM export (Store and Print) can be activated.
- Advanced DICOM package: Besides the export functions of the standard version, also Modality Worklist, Modality Performed Procedure Step and Storage Commitment are available.

The related Implementation Model is shown in Figure 2.

<u>Queue mechanism for MPPS and Export Targets</u>
Examinations or subsets of examinations that have to be stored or printed by the BV Family system will be put in an export queue. Two different scenarios are possible:
- The BV Family system is connected to the network: In this case the storage or print job(s) will be executed immediately over the network to the store or print destination. If MPPS is enabled, the MPPS messages will be sent first.
- The network connection is unavailable: In this case the storage or print job(s) will stay in the export queue. When the system is connected to the network again, the user can resume the export function. The export jobs in the queue will be executed. If MPPS is enabled, the MPPS messages will be sent first.

In the case where the BV Family Export Images (Store) is used, the Images in the examination will be transmitted as separate Secondary Capture Images or as XA Images.

If connected to a network, BV Family AE incorporates the following functionality, as depicted in Figure 2:

- After RWA Export Images (Store) that is initiated by the operator, the BV Family AE as SCU uses the remote SCP Storage Service Class functionality to store local images on a remote database. If enabled for a specific DICOM Store Target, the system will send automatically a Storage Commit Request after transfer of images.
- After RWA Export Images (Print) that is initiated by the operator, the BV Family AE as SCU uses the remote SCP Print Service Class functionality to print images.
- After RWA Check, activated by a service operator, the BV Family AE as SCU provides standard Verification Service Class functionality to a remote SCP.

- After RWA Get Worklist that is initiated by the operator, the BV Family AE as SCU uses the remote SCP Modality Worklist Service Class functionality of the SCP to obtain a Modality Worklist.
- After RWA MPPS, activated by the operator, the BV Family AE as SCU uses the DICOM Modality Performed Procedure Step (MPPS) function of the Study Management Service Class to an external provider to update an MPPS Status.

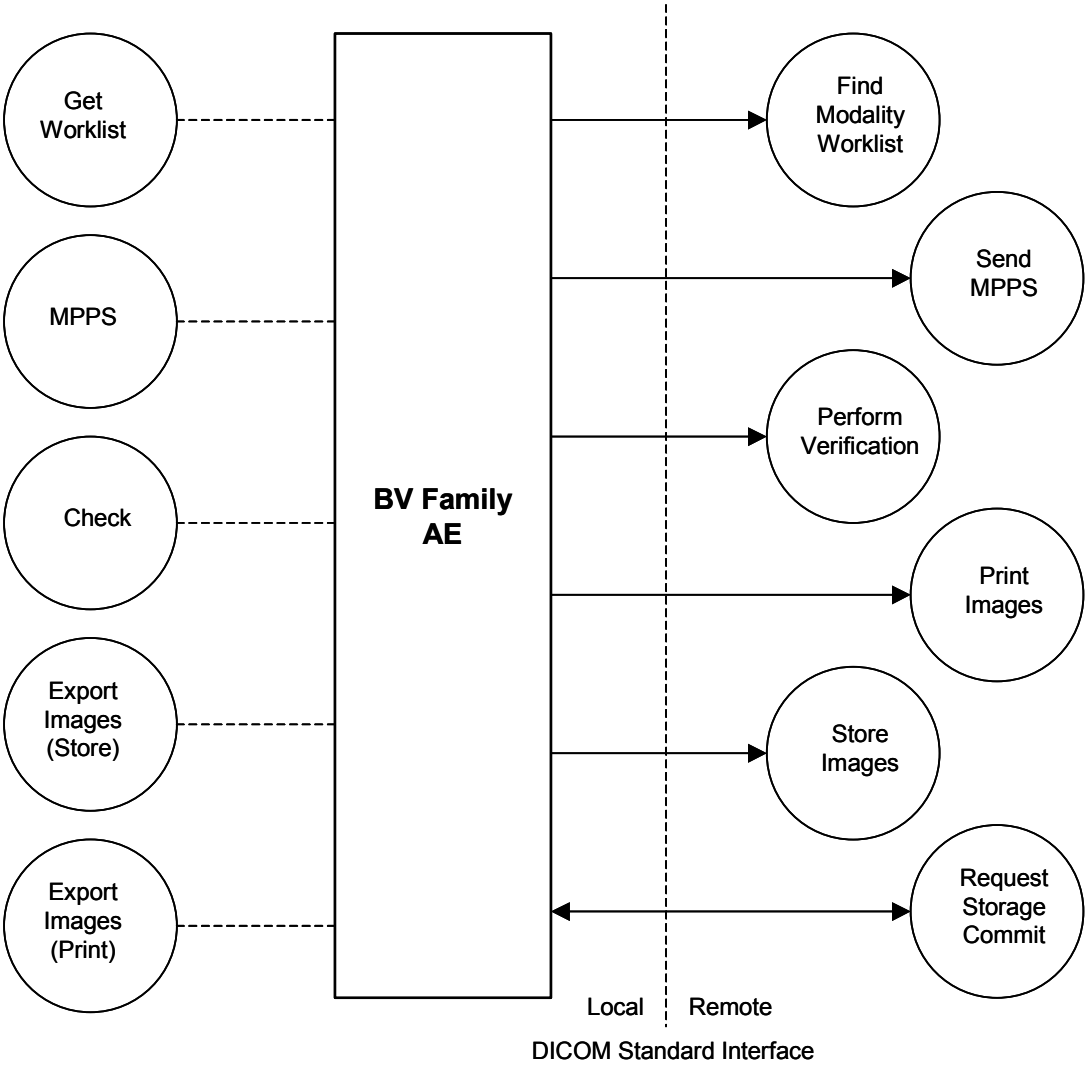

Figure 2. Functional Application Data Diagram

4.1.2. Functional Definition of AE

4.1.2.1. Functional Definition of BV Family Application Entity

Verification Service Class

The BV Family DICOM Verification function can perform the Verification service as SCU (RWA Sequencing of RWA Check).

The BV Family AE will request an association with a remote SCP for the Verification SOP Class. After accepting the association, the remote SCP shall receive and respond to the Verification request. Afterwards the BV Family AE shall release the association.

Storage Service Class
The BV Family DICOM Image Storage function acts as a Service Class User (SCU) of the Storage Service Class (RWA Export Images (Store)).

The BV Family AE will request an association with the selected remote SCP for the Storage Service. After accepting the association, the BV Family AE will send the Storage requests, receive the applicable Storage responses, and release the association when finished.

Storage Commitment Service Class
The BV Family Request Storage Commitment function can perform the Storage Commitment service as SCU (Activity Request Storage Commitment).

The BV Family AE shall request an association with the selected remote SCP for the Storage Commitment Push Model SOP class. When the association is accepted, the BV Family AE shall send the Storage Commitment requests, receive the Storage Commitment responses and act accordingly, and release the association.

When the remote commitment actions have been finished, the remote SCP should request an association with the BV Family AE (still SCU). After accepting the association, the BV Family AE shall receive the Storage Commitment reports, and release the association when requested.

Print Management Service Class
The BV Family DICOM Print function can perform the Print service as SCU (RWA Export Images (Print)).

The BV Family AE shall request an association with the selected remote SCP (printer) for all applicable SOP Classes of the applicable Print Management Meta SOP Class. When the association is accepted, the BV Family AE shall send the Print requests (including data from local database), receive the Print responses and act accordingly, and finally release the association.

Modality Worklist Service Class

The BV Family Find Modality Worklist function can perform the Modality Worklist Management service as SCU (RWA Get Worklist).

The BV Family AE shall request an association with the selected remote SCP for the Modality Worklist Management SOP class. When the association is accepted, the BV Family AE shall send a Find Request to the WLM server with one or more query keys. If the WLM server returns a Worklist, the system compares the received Worklist with the exams previously received. If necessary, the patient list will be updated. Finally, the association will be released.

Modality Performed Procedure Step Service Class

The BV Family Update Modality Performed Procedure Step function can perform the Modality Performed Procedure Step service as SCU (RWA MPPS).

The BV Family AE shall request an association with the selected MPPS provider for the Modality Performed Procedure Step SOP class. When the association is accepted, the BV Family AE shall send an N-CREATE MPPS Request to the MPPS provider. This will be followed immediately with an N-SET MPPS Request for final update of the Performed Procedure Step. Finally, the association will be released.

4.1.3. Sequencing of Real World Activities

This section contains a description of specific sequencing as well as potential constraints of Real-World Activities, including any applicable user interactions, as performed by the BV Family AE.

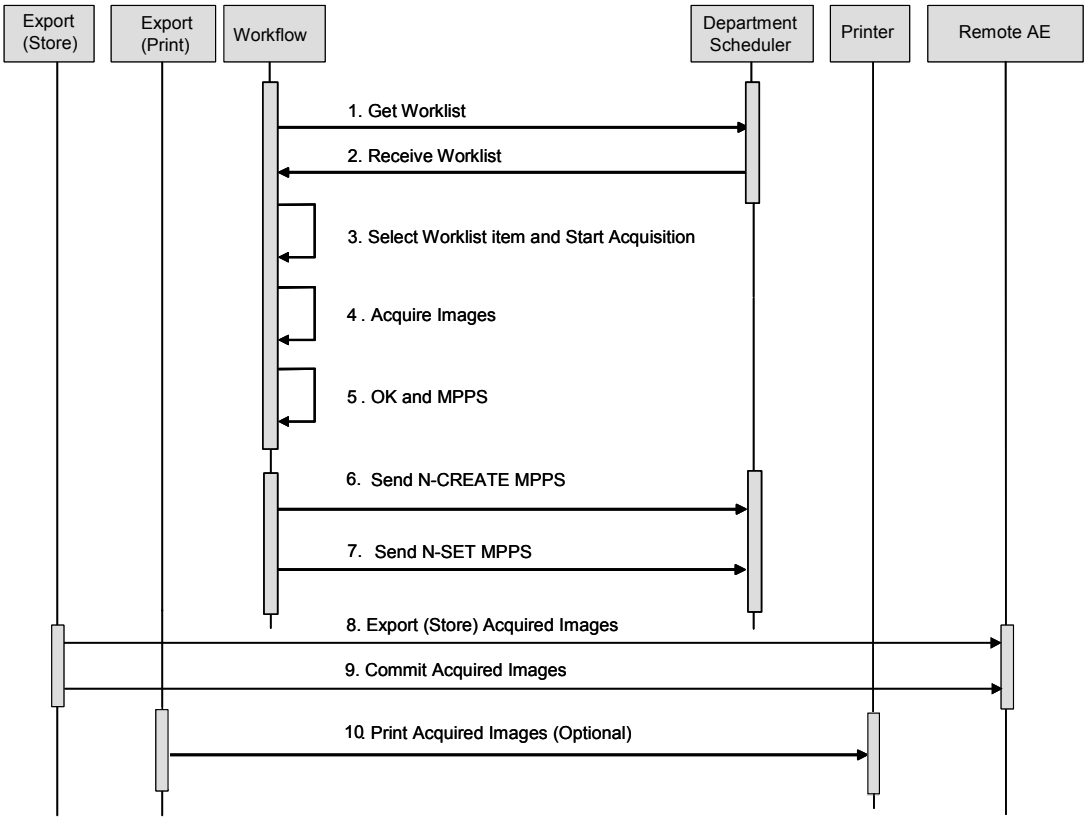

Figure 3. Sequencing of Constraints

A typical scheduled workflow of applied sequencing constraints is illustrated in Figure 3:

1. Get Worklist (system must be connected to the network).
2. Receive Worklist of Scheduled Procedure steps, disconnect the system from the network and switch off.
3. Switched on again in the surgery room, select the desired Worklist Item and start acquisition.
4. Perform the acquisition of images.

5. The user completes the acquisition by pressing OK & MPPS and if required an Export Target is selected to export one or more images. Switch off the system.
6. After connecting again to the network and switching on the system, the jobs in the queue will be executed in the following sequence.
7. Send MMPS N-CREATE request (will be executed before export).
8. Send final MPPS N-SET request.
9. Export (Store) acquired images and perform Storage Commit Request.
10. If required, export (Print) images.

4.2. AE Specifications

This section describes the application entity specifications of the BV Family AE system.

4.2.1. BV Family AE

4.2.1.1. SOP Classes

The BV Family AE provides Standard Conformance to the following DICOM 3.0 SOP classes:

Table 3. Supported SOP Classes for BV Family AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	Yes	No
Basic Grayscale Print Management Meta SOP	1.2.840.10008.5.1.1.9	Yes	No
> Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No
> Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
> Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
> Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Yes	No
XA Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Yes	No
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	Yes	No
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Yes	No

The BV Family AE does not support DICOM 3.0 SOP Classes as SCP.

4.2.1.2. Association Establishment Policies

This section contains a description of the General Association Establishment and Acceptance policies of the AE.

4.2.1.2.1. General

The DICOM standard application context name for DICOM 3.0 is always proposed.

Table 4. DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1

4.2.1.2.2. Number of Associations

Note: For Export and print requests the system will setup an association at the moment of the actual export. The association will be released after the export.

TABLE 5. Number of Associations as an Association Initiator for BV Family

Maximum number of simultaneous associations	2 (Note)

Note: In case export job and storage commit job active simultaneously

4.2.1.2.3. Asynchronous Nature

The BV Family AE does not support asynchronous operations and will not perform asynchronous window negotiation.

4.2.1.2.4. Implementation Identifying Information

The value supplied for Implementation Class UID is documented in Table 6.

TABLE 6. DICOM Implementation Class and Version for BV Family

Implementation Class UID	1.3.46.670589.8.15.1.5.1
Implementation Version Name	BV Family R1.5.1

4.2.1.3. Association Initiation Policy

The BV Family AE will setup an association as a result of one of the following events:

- The service operator initiates a Request for DICOM Verification to a Remote AE via the “Check” button.
- The operator wants to export images of the local database to an external database with the Export Images function.
- If configured, the BV Family AE will send a Request for Storage Commitment for images on the remote database after a successful store operation.
- If the operator selects the “Get Worklist” button, the system will send a Modality Worklist Find request to a Remote AE.
- If MPPS is enabled and the operator performs the required MPPS actions, the BV Family AE will initiate an association for Modality Performed Procedure Step, after exporting images to a selected target.

Note: For all these operations, it is necessary that the system has been connected to the network.

4.2.1.3.1. Check

4.2.1.3.1.1. Description and Sequencing of Activities

In the service mode of the BV Family AE an association can be built up to verify the application level communication using the C-ECHO command. The C-ECHO is initiated with a “check” function that is executed via a separate service PC in the BV Scope program.

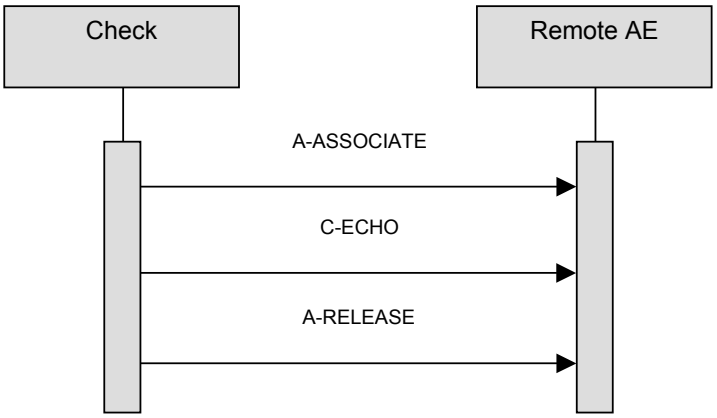

Figure 4. Sequencing of RWA Check

4.2.1.3.1.2. Proposed Presentation Contexts

The BV Family AE Verify will propose the following presentation contexts:

TABLE 7. Proposed Presentation Context for BV Family

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

4.2.1.3.1.3. SOP Specific Conformance for Verify

The BV Family AE system provides standard conformance.

4.2.1.3.2. Export Images (Store)

4.2.1.3.2.1. Description and Sequencing of Activities

The BV Family AE RWA Export Images (Store) transmits the images from the examination from a specific patient on the user interface to the selected target device. Images are sent via the DICOM Secondary Capture Image Storage Service Class or XA Image Storage Service Class depending on the selected image format.

Each Secondary Capture Image will be sent individually with a C-STORE request. XA images are sent as multi-frame images.

At any time, the processing of an export job can be cancelled. In this case, the system will abort the processing immediately. A cancelled job can be resumed again afterwards via the “Resume Export” function. The complete session will be resend.

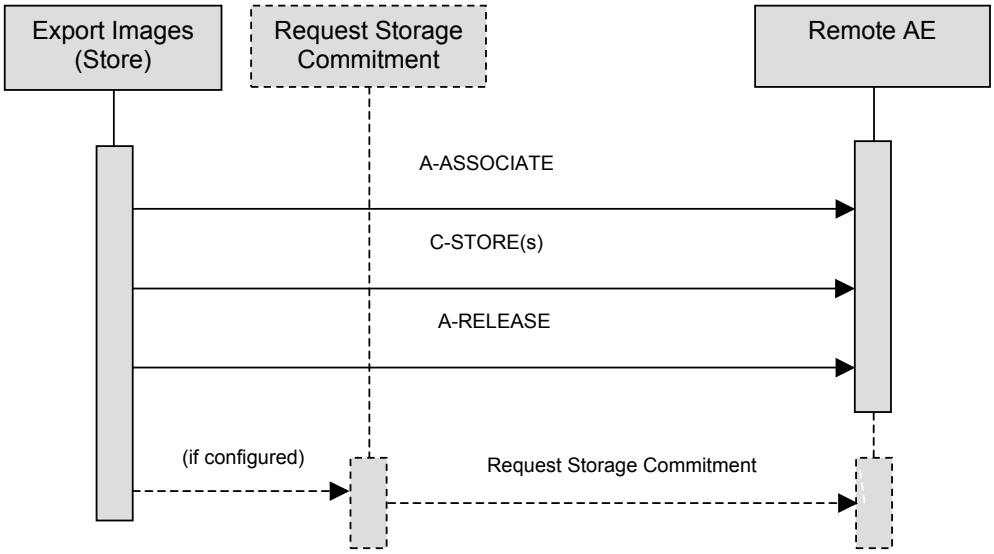

Figure 5. Sequencing of RWA Export Images

A typical sequence of DIMSE messages sent over an association between BV Family AE and a Remote AE is illustrated in Figure 5:

1. BV Family AE opens an association to the Remote AE.
2. An acquired image is transmitted to the Remote AE using a C-STORE request and the Remote AE replies with a CSTORE response (status success. This will be repeated for each image that has to be sent.
3. BV Family AE releases the association.
4. If configured, BV Family AE will initiate a request for Storage Commitment automatically to the Remote AE.

4.2.1.3.2.2. Proposed Presentation Contexts

The BV Family AE will propose the following presentation contexts for Image Storage:

Table 8. Proposed Presentation Context for BV Family

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

4.2.1.3.2.3. SOP Specific Conformance to Storage SOP Classes

Figure 6 gives an overview of the DICOM data model. Also an overview of the real life situation is given. The BV Family database contains several examinations (not patients). This means that when the patient information is changed it is only changed in one examination, in other examinations based on the same patient the patient information isn't changed.

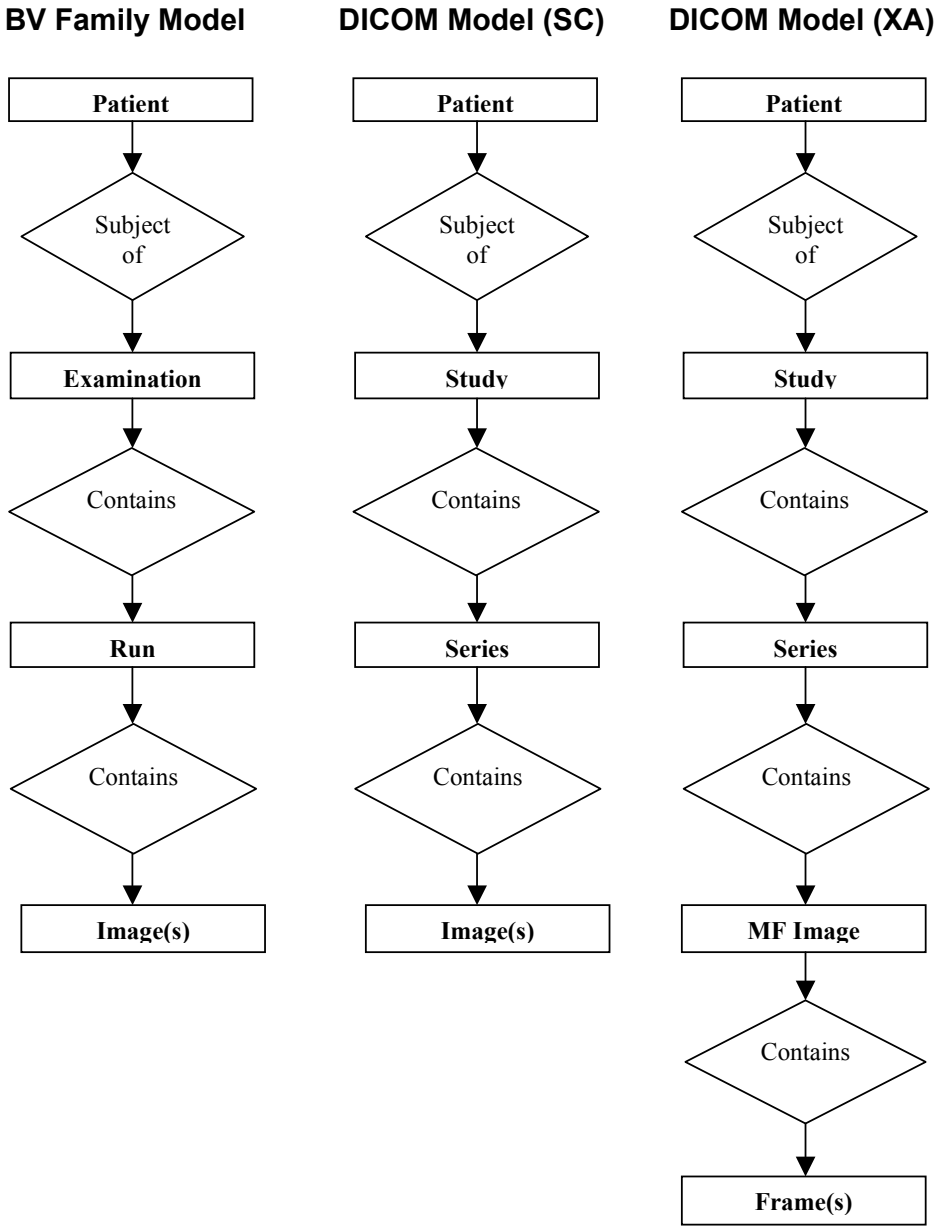

Figure 6. DICOM Data Model and BV Family Data Model

An image in an examination contains information for only one patient. An examination has several runs; a run is a series of images. When images are exported with the Export function, information such as Patient name and study ID is the same for each individual image.

Upon receiving a C-STORE response containing an Error or a Refused status the implementation will release the association. All of the selected images generated of that examination will be considered by the BV Family AE to have failed to transfer. The user of has the ability to resume export jobs manually.

In case of Secondary Capture Image Storage: One series can include one or more images.
In case of XA Image Storage: One series includes one image with one or more frames.

Table 9 shows the C-STORE Command response status handling behavior.

TABLE 9. DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success		0000	Normal Completion
Refused	Out of Resources	A7xx	Image transfer considered failed. Images remain in queue. User can initiate re-transfer. Status logged in system file
Error	Data Set does not match SOP Class Cannot understand	A9xx C000	Image transfer considered failed. Images remain in queue. User can initiate re-transfer. Status logged in system file
Warning	Coercion of Data Elements Data Set does not match SOP Class Elements Discarded	B000 B007 B006	Image transfer considered successful. Status logged in system file

The behavior of the AE during communication failure is summarized in Table 10.

Table 10. DICOM Command Communication Failure Behavior

Exception	Behavior
Association setup failure	No automatic retry. Session should be resumed manually
Network Timeout behaviour	See section 4.4.2 for corresponding Time to wait parameters

4.2.1.3.3. Export Images (Print)

4.2.1.3.3.1. Description and Sequencing of Activities

The BV Family AE Export Images (Print) function has the capability to print images via the DICOM Basic Print services using the Presentation Contexts defined in the Table 11 shown on page 15, to the selected Print target device.

The BV Family AE will create a Film Session (based on the selected Layout) containing a single Film Box. The BV Family AE will subsequently fill in the content of the image box and request the print at the Film Box level. The Film Session is deleted

once the Print session has completed. A new Film Box is created for each successive film within the Film session.

BV Family AE is configured to acquire Grayscale images, and to negotiate for Basic Grayscale DICOM print on each output.
At any time, the processing of a print job can be cancelled. In this case, the system will abort the processing immediately.

Upon receiving a Print command response containing a Failure status, the implementation will release the association. All of the selected images generated of that examination will be considered by the BV Family AE to have failed to print. The user of has the ability to resume the export (Print) jobs manually.

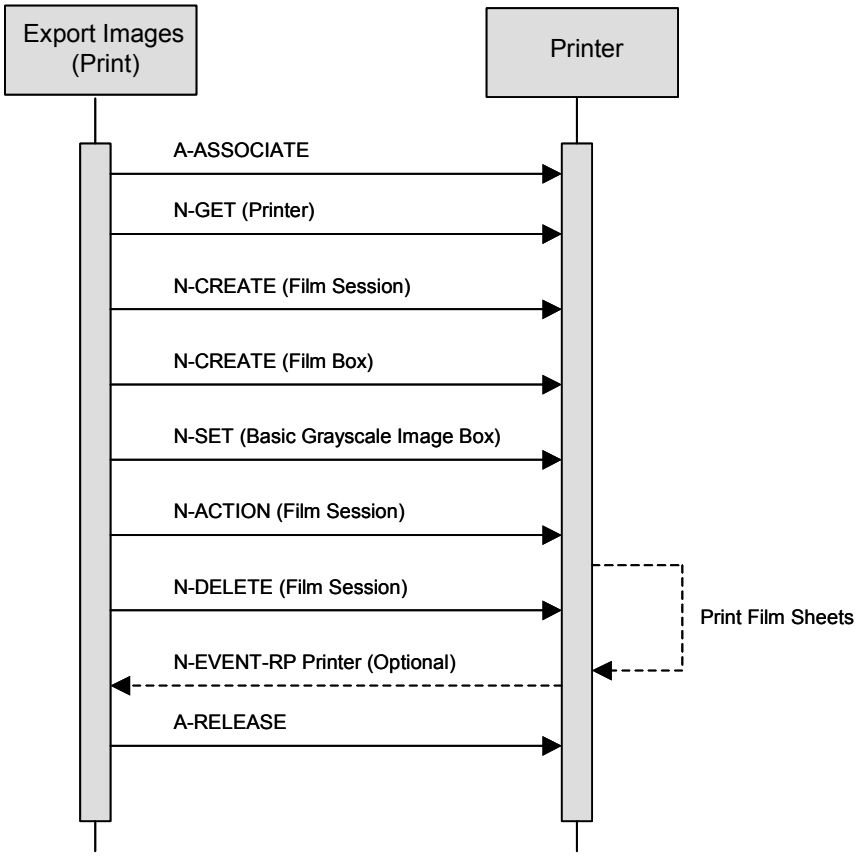

Figure 7. Sequencing of RWA Export Images (Print)

A typical sequence of DIMSE messages sent over an association between BV Family AE and a Printer is illustrated in Figure 7:

1. BV Family AE opens an association with the selected Printer.
2. BV Family AE sends an N-GET command to the Printer. Only in case of a Printer response Status of “Normal”, image Transfer will start.
3. BV Family AE sends an N-CREATE Film Session to the Printer.
4. BV Family AE sends an N-CREATE Film Box command to the Printer for each Film Box to be printed.

5. For each Film Box, BV Family AE sends one or more N-SET Image Box command(s) to the Printer.

6. When all images are transferred, BV Family AE will send an N-ACTION Film Session to the Printer.

7. BV Family AE will delete the Film Session by sending an N-DELETE Film Session to the Printer and the association will be released.

4.2.1.3.3.2. Proposed Presentation Contexts

The BV Family AE will propose the following presentation contexts:

Table 11. Proposed Presentation Context for BV Family

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
See Note		ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

Note: Any of the standard Print Meta SOP classes and their subsequent Print SOP classes as listed in Table 3.

The following DIMSE Services are supported:

Table 12. Supported DIMSE Service Elements

SOP Class	Supported DIMSE Service Element
Printer SOP Class	N-GET, N-EVENT-REPORT
Basic Film Session SOP Class	N-CREATE, N-ACTION, N-DELETE
Basic Film Box SOP Class	N-CREATE
Basic Greyscale Image Box SOP Class	N-SET

4.2.1.3.3.3. SOP Specific Conformance to Print SOP Classes

The BV Family AE supports the Basic Grayscale Print Management SOP Classes. Films are printed according to the real world activity described earlier.

Upon receiving a normalised service response (N-CREATE, N-SET) containing a Failure Status, the BV Family AE will release the association. The printing of the whole session will be considered failed. The BV Family AE has the ability to recover from this situation. In this case the user has to resume the print job manually.

Before a job in the print export queue is actually started, the system will retrieve the printer status. Upon receiving a normalised service response (N-GET) containing a Failure or Warning Status, the system should not start to export the job.

Errors that occur are logged in a system file; no information is given through the user interface. The attributes supported can be found sorted per IOD Module in next the tables. The following abbreviations are used:

- VNAP Value Not Always Present (attribute sent zero length if no value is present)
- ANAP Attribute Not Always Present
- ALWAYS Always Present
- EMPTY Attribute is sent without a value
- USER the attribute value source is from User input

- AUTO the attribute value is generated automatically
- CONFIG the attribute value source is a configurable parameter

Table 13. Printer SOP Class - N-GET-RQ - Printer Module

Attribute Name	Tag	VR	Note	Presence of Value	Source
Printer Status	2110,0010	CS	Printer Status provided by printer	ALWAYS	PRINTER
Printer Status Info	2110,0020	CS	Printer Status Info provided by printer	ALWAYS	PRINTER

Table 14. Basic Film Session SOP Class - N-CREATE-RQ - Basic Film Session Presentation Module

Attribute Name	Tag	VR	Note	Presence of Value	Source
Number of Copies	2000,0010	IS	Integer (1-99), DEFAULT	ALWAYS	CONFIG
Print Priority	2000,0020	CS	LOW, MED, HIGH, DEFAULT	ALWAYS	CONFIG
Medium Type	2000,0030	CS	CURRENT, BLUE FILM, CLEAR FILM, PAPER, TRANSPARENCY, DEFAULT	ALWAYS	CONFIG
Film Destination	2000,0040	CS	CURRENT, PROCESSOR, MAGAZINE, BIN (integer), DEFAULT	ALWAYS	CONFIG
Film Session Label	2000,0050	LO	Equal to Exam. Type	ALWAYS	AUTO

Note: The Value Range and DEFAULT values are printer type dependent

Table 15. Basic Film Box SOP Class - N-CREATE-RQ - Basic Film Box Presentation Module

Attribute Name	Tag	VR	Note	Presence of Value	Source
Image Display Format	2010,0010	ST	STANDARD\1,1, STANDARD\1,2, STANDARD\2,2, STANDARD\2,3	ALWAYS	USER
Film Orientation	2010,0040	CS	LANDSCAPE, PORTRAIT	ALWAYS	CONFIG
Film Size ID	2010,0050	CS	CURRENT, 10INX12IN, 10INX14IN, 11INX11IN, 11INX14IN, 11INX17IN, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM, 8INX10IN, 8_5INX11IN, A4, A3, DEFAULT	ALWAYS	CONFIG
Magnification Type	2010,0060	CS	BILINEAR, CUBIC, NONE, REPLICATE, DEFAULT	ALWAYS	CONFIG
Smoothing Type	2010,0080	CS	0, 1, 10, 11, 12, 13, 14, 140, 15, 2, 3, 4, 5, 6, 7, 8, 9, ENHANCED, ENHANCED1, MEDIUM, NORMAL, SHARP, SMOOTH	ALWAYS	CONFIG
Border Density	2010,0100	CS	BLACK, WHITE, OD (Integer), DEFAULT	ALWAYS	CONFIG
Empty Image Density	2010,0110	CS	BLACK, WHITE,DEFAULT	ALWAYS	CONFIG
Min Density	2010,0120	US	0...1000, DEFAULT	ALWAYS	CONFIG
Max Density	2010,0130	US	0...1000, DEFAULT	ALWAYS	CONFIG
Trim	2010,0140	CS	NO, YES, DEFAULT	ALWAYS	CONFIG
Configuration Information	2010,0150	ST	Printer configurable: Character string (max. 1024 char.), DEFAULT	ALWAYS	CONFIG

Note: The Value Range and DEFAULT values are printer type dependent

Table 16. Basic Film Box SOP Class - N-CREATE-RQ - Basic Film Box Relationship Module

Attribute Name	Tag	VR	Note	Presence of Value	Source
Referenced Film Session Sequence	2010,0500	SQ		ALWAYS	AUTO
>Referenced SOP	0008,1150	UI	Applied Value(s): 1.2.840.10008.5.1.1.1	ALWAYS	AUTO

Attribute Name	Tag	VR	Note	Presence of Value	Source
Class UID					
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	PRINTER

Table 17. Basic Grayscale Image Box SOP Class - N-SET-RQ - Image Box Pixel Presentation Module

Attribute Name	Tag	VR	Note	Presence of Value	Source
Image Position	2020,0010	US	Generated	ALWAYS	AUTO
Polarity	2020,0020	CS	NORMAL, REVERSE, DEFAULT	ALWAYS	CONFIG
Preformatted Grayscale Image Sequence	2020,0110	SQ		ALWAYS	AUTO
>Samples per Pixel	0028,0002	US	Applied Value(s): 1	ALWAYS	AUTO
>Photometric Interpretation	0028,0004	CS	Applied Value(s): MONOCHROME2	ALWAYS	AUTO
>Rows	0028,0010	US	See Table 18	ALWAYS	AUTO
>Columns	0028,0011	US	See Table 18	ALWAYS	AUTO
>Pixel Aspect Ratio	0028,0034	IS	See Table 18	ANAP	AUTO
>Bits Allocated	0028,0100	US	Applied Value(s): 8	ALWAYS	AUTO
>Bits Stored	0028,0101	US	Applied Value(s): 8	ALWAYS	AUTO
>High Bit	0028,0102	US	Applied Value(s): 7	ALWAYS	AUTO
>Pixel Representation	0028,0103	US	Applied Value(s): 0x0000	ALWAYS	AUTO
>Pixel Data	7FE0,0010	OW		ALWAYS	AUTO

Note: The Value Range and DEFAULT values are printer type dependent

Table 18. Applied values for Rows, Columns and Aspect Ratio

Interpolation On - Off	Rows	Columns	Pixel Aspect Ratio
On	768	1008	Not sent
Off	560	1008	753\549

All details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors are provided in Table 19 to 22.

TABLE 19. DICOM Command Response Status Handling Behavior for Basic Film Session N-CREATE

Service Status	Further Meaning	Error Code	Behavior
Success	Film Session successfully created	0000	Normal Completion
Warning		B6XX	Print Film Session considered successful. Status logged in system file
Failure			Print Film Session considered failed. Status logged in system file

TABLE 20. DICOM Command Response Status Handling Behavior for Basic Film Box N-CREATE

Service Status	Further Meaning	Error Code	Behavior
Success	Film Box successfully created	0000	Normal Completion
Warning		B6XX	Print Film Session considered successful. Status logged in system file
Failure		C6XX	Print Film Session considered failed. Status logged in system file

TABLE 21. DICOM Command Response Status Handling Behavior for Basic Grayscale Image Box N-SET

Service Status	Further Meaning	Error Code	Behavior
Success	Image successfully stored in Image Box	0000	Normal Completion
Warning		B6XX	Print Film Session considered successful. Status logged in system file
Failure		C6XX	Print Film Session considered failed. Status logged in system file

TABLE 22. DICOM Command Response Status Handling Behavior for Basic Film Session N-ACTION

Service Status	Further Meaning	Error Code	Behavior
Success	Film accepted for printing	0000	Normal Completion
Warning		B6XX	Print Film Session considered successful. Status logged in system file
Failure		C6XX	Print Film Session considered failed. Status logged in system file

The behavior of the AE during communication failure is summarized in next Table.

Table 23. DICOM Command Communication Failure Behavior

Exception	Behavior
Association setup failure	No automatic retry. Session should be resumed manually
Network Timeout behaviour	See section 4.4.2 for corresponding Time to wait parameters

4.2.1.3.4. Get Worklist

4.2.1.3.4.1. Description and Sequencing of Activities

The BV Family AE has the capability to query for a worklist via the DICOM Modality Worklist Management service defined in the Table 24 shown on page 23, to the Modality Worklist provider. This is activated when the user selects “Get Worklist”.

After setup of the association, the BV Family AE will send a C-FIND Modality Worklist request. The Modality Worklist provider returns one or more worklist items. These are compared with the list that was previously received. In case there are any changes,

the Patient File on the system is updated. The BV Family AE will use the following concept for identification:
A unique identification has a unique match of all of the following attributes:

- Scheduled Procedure Step ID
- Accession Number
- Requested Procedure ID

If none of these identification attributes is present, the received worklist entry is ignored.

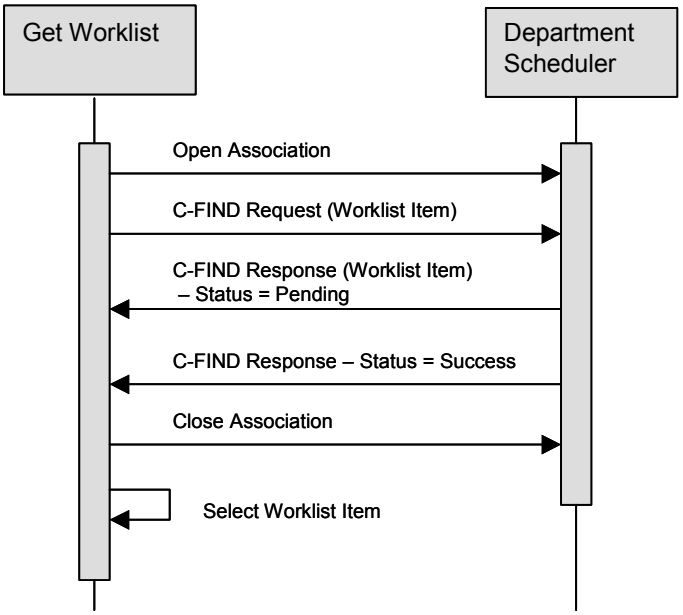

Figure 8. Sequencing of RWA Get Worklist

A typical sequence of DIMSE messages sent over an association between BV Family AE and a Department Scheduler is illustrated in Figure 8:

1. BV Family AE opens an association with the Departmental Scheduler
2. BV Family AE sends a C-FIND request to the Departmental Scheduler containing the Worklist Query attributes.
3. The Departmental Scheduler returns a C-FIND response containing the requested attributes of the first matching Worklist Item.
4. The Departmental Scheduler returns another C-FIND response with status Success indicating that no further matching Worklist Items exist. This example assumes that only one Worklist items match the Worklist Query.
5. BV Family AE closes the association with the Departmental Scheduler.
6. The user selects a Worklist Item from the Worklist and prepares to acquire new images.

4.2.1.3.4.2. Proposed Presentation Contexts

The BV Family AE will propose the following presentation contexts:

Table 24. Proposed Presentation Context for BV Family

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Modality Worklist Information Model – FIND SOP Class	1.2.840.10008.5.1.4.31	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

4.2.1.3.4.3. SOP Specific Conformance to MWL SOP Class

BV Family has a restriction on the maximum number of received DICOM Modality worklist items. If the total number of worklist items exceeds 99, BV Family AE will abort the association immediately using a DICOM A-ABORT. Remark that this number of 99 is the sum of both incoming worklist items as items that were already on the system from a previous DICOM Modality Worklist Query.

The behavior of BV Family AE when encountering status codes in a Modality Worklist C-FIND response is summarized in Table 25.

Table 25. Modality Worklist Information Model – C-FIND Response Status Handling Behavior

Service Status	Status Codes	Further Meaning	Behaviour of BV Family upon receiving of the Status Codes
Refused	A700	Out of resources	Processing of the matches and the association is terminated. A message appears on the User Interface.
Failed	A900	Identifier does not match SOP Class	The association is terminated and the status is logged into the system error log. A message appears on the User Interface.
	Cxxx	Unable to process	Processing of the matches and the association is terminated. A message appears on the User Interface.
Success	0000	Matching is complete - No final identifier is supplied	The association is released and the matches are stored.
Pending	FF00	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	Processing of the matches continues.
	FF01	Matches are continuing - Warning that one or more Option Keys were not supported for existence of this identifier.	Processing of the matches continues without any warnings or errors.

Table 26. DICOM Command Communication Failure Behavior

Exception	Behavior
Association setup failure	The Association is aborted and the worklist query marked as failed. The reason is logged and reported in the logfile, accessible via BV-Scope.
Network Timeout behavior	See section 4.4.2 for corresponding configurable Time to wait parameters.

Modality Worklist is accomplished according to the real world activity described earlier. The BV Family AE provides Standard conformance to the Modality Worklist SOP Class. The attributes supported can be found sorted per IOD Module in next Table:

Table 27. Modality Worklist Request Identifier

Attribute Name	Tag	VR	M	R	DW	DP	IOD
Patient Identification Module							
Patient's Name	0010,0010	PN		x	x	x	x
Patient ID	0010,0020	LO		x	x	x	x
Patient Demographic Module							
Patient's Birth Date	0010,0030	DA		x	x	x	x
Patient's Birth Time	0010,0032	TM		x			x
Patient's Sex	0010,0040	CS		x	x	x	x
Other Patient IDs	0010,1000	LO		x			x
Other Patient Names	0010,1001	PN		x	x		x
Patient's Weight	0010,1030	DS		x	x		x
Patient Medical Module							
Medical Alerts	0010,2000	LO		x	x		
Contrast Allergies	0010,2110	LO		x	x		
Special Needs	0038,0050	LO		x	x		
Visit Relationship Module							
Referenced Patient Sequence	0008,1120	SQ		x			x
>Referenced SOP Class UID	0008,1150	UI		x			x
>Referenced SOP Instance UID	0008,1155	UI		x			x
Scheduled Procedure Step Module							
Scheduled Procedure Step Sequence	0040,0100	SQ		x			
>Modality	0008,0060	CS	S		x		x
>Scheduled Station AE Title	0040,0001	AE	S				
>Scheduled Procedure Step Start Date	0040,0002	DA	R				
>Scheduled Procedure Step Start Time	0040,0003	TM		x			
>Scheduled Performing Physician's Name	0040,0006	PN		x			
>Scheduled Procedure Step Description	0040,0007	LO		x	x		x
>Scheduled Action Item Code Sequence	0040,0008	SQ		x			
>>Code Value	0008,0100	SH		x			
>>Coding Scheme Designator	0008,0102	SH		x			
>>Coding Scheme Version	0008,0103	LO		x			
>>Code Meaning	0008,0104	LO		x			
>Scheduled Procedure Step ID	0040,0009	SH		x			x
>Scheduled Station Name	0040,0010	SH	S				
>Scheduled Procedure Step Location	0040,0011	SH		x	x		
>Requested Contrast Agent	0032,1070	LO		x	x		
>Pre-Medication	0040,0012	LO		x	x		
Requested Procedure Module							
Study Instance UID	0020,000D	UI		x			x
Referenced Study Sequence	0008,1110	SQ		x			x
>Referenced SOP Class UID	0008,1150	UI		x			x
>Referenced SOP Instance UID	0008,1155	UI		x			x
Requested Procedure Description	0032,1060	LO		x	x		
Requested Procedure Code Sequence	0032,1064	SQ		x			
>Code Value	0008,0100	SH		x			
>Coding Scheme Designator	0008,0102	SH		x			
>Coding Scheme Version	0008,0103	LO		x			
>Code Meaning	0008,0104	LO		x			
Requested Procedure ID	0040,1001	SH		x	x		x
Imaging Service Request Module							
Accession Number	0008,0050	SH		x	x	x	x

Attribute Name	Tag	VR	M	R	DW	DP	IOD
Referring Physician's Name	0008,0090	PN		x	x		x
SOP Common Module							
Specific Character Set	0008,0005	CS					

The following abbreviations are used in the table:

Tag: DICOM tag for this attribute.

VR: DICOM VR for this attribute.

M: Matching keys for Worklist Update. An "S" will indicate that BV Family AE will supply an attribute value for Single Value Matching; an "R" will indicate Range Matching. The matching Keys must be configured.

R: Return keys. An "x" will indicate that BV Family AE will supply this attribute as Return Key with zero length for Universal Matching.

DP: Displayed keys on the Patient Administration screen. An "x" indicates that this worklist attribute is displayed to the user in the main patient administration panel. For example, Patient Name will be displayed when registering the patient prior to an examination.

DW: Displayed keys on the Worklist Administration screen. An "x" indicates that this worklist attribute is displayed to the user in the worklist review panel.

IOD: An "x" indicates that this Worklist attribute is included into other Object Instances created during performance of the related Procedure Step.

The default Query Configuration is set to "Modality" (OT) and "Date" (date of today +/- 1 day). Optionally, additional matching for the own AET is configurable.

4.2.1.3.5. MPPS

4.2.1.3.5.1. Description and Sequencing of activities

The BV Family AE has the capability to send status information about a Performed Procedure Step via the DICOM Modality Performed Procedure Step service defined in the Table 28 shown on page 27, to an MPPS provider. This is activated when the user selects the "MPPS & OK" button.

The BV Family AE initiates an association to the MPPS server and sends over an N-CREATE message with all appropriate information for the study. Afterwards, an N-SET message is sent with end date, end time and a status of "COMPLETED" or DISCONTINUED". Upon completion of the N-SET, the association is released.

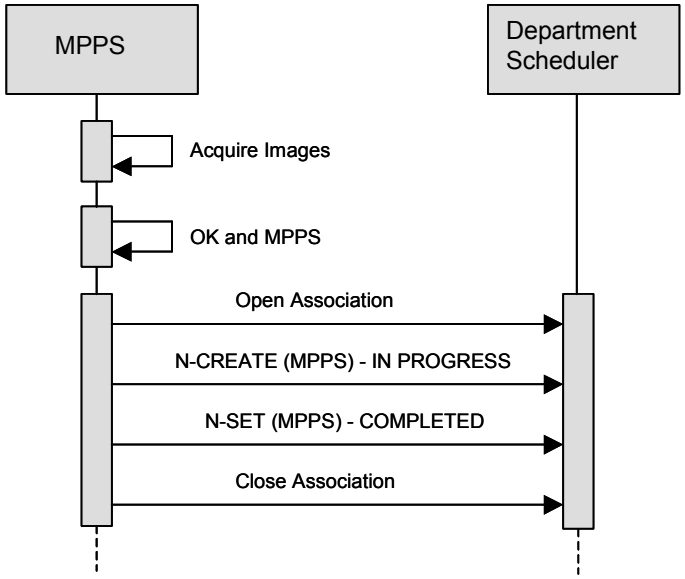

Figure 9. Sequencing of RWA Request Send MPPS

A typical sequence of DIMSE messages sent over an association between BV Family AE and a Departmental Scheduler is illustrated in Figure 9:

1. The user selects an examination for export to an Export Target.
2. The user selects OK & MPPS button. Afterwards, a Protocol Name has to be selected and a study Status of “COMPLETED”.
3. BV Family AE opens an association with the Departmental Scheduler.
4. BV Family AE sends an N-CREATE MPPS with status equal to “IN PROGRESS”.
5. BV Family AE sends an N-SET MPPS with status equal to “COMPLETED”.
6. BV Family closes the association.

4.2.1.3.5.2. Proposed Presentation Contexts

The BV Family AE will propose the following presentation contexts:

Table 28. Proposed Presentation Contexts for the Modality Performed Procedure Step

Abstract Syntax Name	UID	Transfer Syntax	UID List	Role	Ext. Neg.
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

The following DIMSE Services are supported:

Table 29. Supported DIMSE Service Elements

SOP Class	Supported DIMSE Service Element
Modality Performed Procedure Step SOP Class	N-CREATE
	N-SET

4.2.1.3.5.3. SOP Specific Conformance to Modality Performed Procedure Step

The behavior of BV Family AE when encountering status codes in an MPPS N-CREATE or N–SET response is summarized in Table 30.

Table 30. MPPS N-CREATE / N-SET Response Status Handling Behavior

Service Status	Status Codes	Further Meaning	Behaviour of BV Family upon receiving of the Status Codes
Success	0000	Success	The SCP has completed the operation successfully.
Failure	0110	Processing Failure – Performed Procedure Step Object may no longer be updated.	The Association is aborted and the MPPS is marked as failed in the export queue.
Failure	0105	No such attribute.	The Association is aborted and the MPPS is marked as failed in the export queue.
Warning	0116	Attribute Value Out of Range.	The MPPS operation is considered successful.
Warning	0107	Attribute List Error.	The MPPS operation is considered successful.

Table 31. DICOM Command Communication Failure Behavior

Exception	Behavior
Association setup failure	The Association is aborted and the MPPS update marked as failed in the export queue. The user has the ability to resume the job.
Network Timeout behavior	See section 4.4.2 for corresponding configurable Time to wait parameters.

Modality Performed Procedure Step is accomplished according to the real world activity MPPS described earlier. The BV Family AE provides Standard conformance to the Modality Performed Procedure Step SOP Class.
Table 32 provides a description of the MPPS N-CREATE and N-SET request identifiers sent by The BV Family AE. Empty cells in the N-CREATE and N-SET columns indicate that the attribute is not sent. An “x” or a “value” indicates that an appropriate value will be sent. An “EMPTY” attribute will be sent with zero length.

Table 32. Modality Performed Procedure Step SOP Class - N-CREATE-RQ - Sop Common Module

Attribute Name	Tag	VR	N-CREATE	N-SET
SOP Common Module				
Specific Character Set	0008,0005	CS	ISO_IR 100	ISO_IR 100
Image Acquisition Results Module				
Modality	0008,0060	CS	From WLM	
Study ID	0020,0010	SH	EMPTY	
Performed Protocol Code Sequence	0040,0260	SQ	EMPTY	
Performed Series Sequence	0040,0340	SQ	EMPTY	x
>Retrieve AE Title	0008,0054	AE		EMPTY

Attribute Name	Tag	VR	N-CREATE	N-SET
>Series Description	0008,103E	LO		EMPTY
>Performing Physician's Name	0008,1050	PN		User selectable
>Operator's Name	0008,1070	PN		User selectable in MPPS panel
>Referenced Image Sequence	0008,1140	SQ		Reference to all sent images
>>Referenced SOP Class UID	0008,1150	UI		Reference to all sent images
>>Referenced SOP Instance UID	0008,1155	UI		Reference to all sent images
>Protocol Name (Technologist)	0018,1030	LO		User selectable in MPPS panel
>Series Instance UID	0020,000E	UI		Reference to series
>Referenced Standalone SOP Instance Sequence	0040,0220	SQ		EMPTY
Performed Procedure Step Information Module				
Procedure Code Sequence	0008,1032	SQ	EMPTY	
Performed Station AE Title	0040,0241	AE	System AE Title	
Performed Station Name	0040,0242	SH	Station Name	
Performed Location	0040,0243	SH	EMPTY	
Performed Procedure Step Start Date	0040,0244	DA	Exam date	
Performed Procedure Step Start Time	0040,0245	TM	Exam time (format: hhmm)	
Performed Procedure Step End Date	0040,0250	DA	EMPTY	x
Performed Procedure Step End Time	0040,0251	TM	EMPTY	x (format: hhmm)
Performed Procedure Step Status	0040,0252	CS	Value: IN PROGRESS	“COMPLETED” or “DISCONTINUED”
Performed Procedure Step ID	0040,0253	SH	Running Counter	
Performed Procedure Step Description	0040,0254	LO	EMPTY	EMPTY
Performed Procedure Type Description	0040,0255	LO	EMPTY	EMPTY
Performed Procedure Step Relationship Module				
Referenced Patient Sequence	0008,1120	SQ	EMPTY or from WLM	
>Referenced SOP Class UID	0008,1150	UI	From WLM	
>Referenced SOP Instance UID	0008,1155	UI	From WLM	
Patient's Name	0010,0010	PN	Patient Name	
Patient ID	0010,0020	LO	Registration number	
Patient's Birth Date	0010,0030	DA	Date of Birth	
Patient's Sex	0010,0040	CS	Value: F, M, or O	
Scheduled Step Attribute Sequence	0040,0270	SQ	x	
>Accession Number	0008,0050	SH	From WLM or entered by the user.	
>Referenced Study Sequence	0008,1110	SQ	EMPTY or from WLM	
>>Referenced SOP Class UID	0008,1150	UI	From WLM	
>>Referenced SOP Instance UID	0008,1155	UI	From WLM	
>Study Instance UID	0020,000D	UI	Newly generated or from WLM	
>Requested Procedure Description	0032,1060	LO	EMPTY or from WLM	
>Scheduled Procedure Step Description	0040,0007	LO	EMPTY or from WLM	
>Scheduled Protocol Code Sequence	0040,0008	SQ	EMPTY or from WLM	
>>Code Value	0008,0100	SH	From WLM	
>>Coding Scheme Designator	0008,0102	SH	From WLM	
>>Coding Scheme Version	0008,0103	SH	From WLM	
>>Code Meaning	0008,0104	LO	From WLM	
>Scheduled Procedure Step ID	0040,0009	SH	EMPTY or from WLM	
>Requested Procedure ID	0040,1001	SH	EMPTY or from WLM	

4.2.1.3.6. Request Storage Commitment

4.2.1.3.6.1. Description and Sequencing of Activities

The Activity Request Storage Commitment involves the storage commitment of images on a remote system. If configured, Storage Commitment will be initiated in a new association automatically after closing the association of the related storage (C-STORE).
When the images are sent to the target successfully, they are moved from the export queue to the storage commit queue. BV Family AE sends a storage Commitment Request to the export SCP. This association will be closed after receiving the Storage Commitment Request acknowledge.
BV Family AE is able to receive associations from the Remote AE for the acceptance of the N-EVENT-REPORT Storage Commitment response. The images will be removed from the storage commit queue after receiving an N-EVENT-REPORT with EVENT Type ID equals 1.

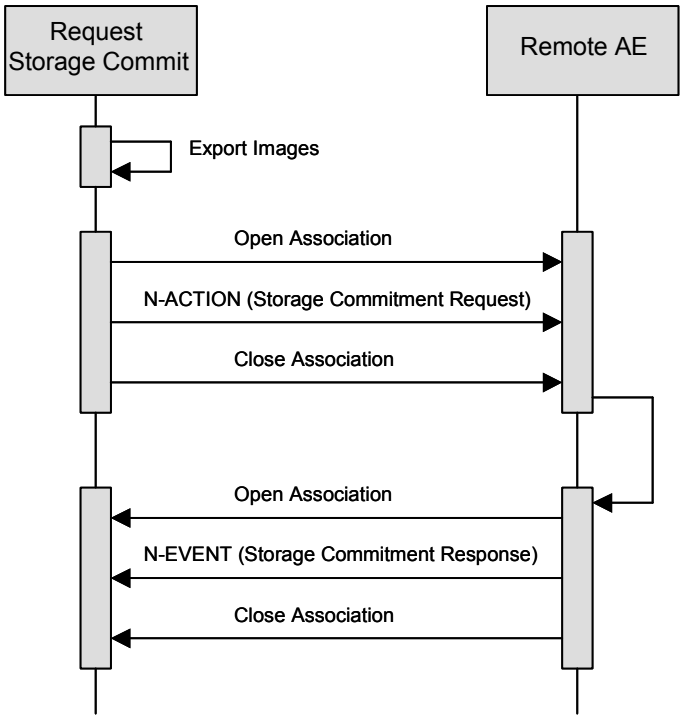

Figure 10. Sequencing of Activity Request Storage Commit

A typical sequence of DIMSE messages sent over an association between BV Family AE and a Remote AE is illustrated in Figure 10:

1. BV Family AE opens an association with the Remote AE.
2. BV Family AE sends storage Commitment N-ACTION Request to the Remote SCP. The Remote SCP sends a Commitment Request acknowledge.
3. BV Family AE closes the association with the Remote AE.

4.2.1.3.6.2. Proposed Presentation Contexts

In this subsection, the Presentation Contexts proposed by the BV Family AE for Request Storage Commitment are defined in Table 33.

TABLE 33. Proposed Presentation Context for BV Family

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Storage Commitment Push Model	1.2.840.10008.1.20.1	ILE	1.2.840.10008.1.2	SCU	None
		ELE	1.2.840.10008.1.2.1	SCU	None
		EBE	1.2.840.10008.1.2.2	SCU	None

4.2.1.3.6.3. SOP Specific Conformance for SOP Class

The behavior of BV Family AE when encountering status codes in a N-ACTION response is summarized in Table 34.

Table 34. Storage Commitment N-ACTION Response Status Handling Behavior

Service Status	Status Codes	Further Meaning	Behaviour of BV Family upon receiving of the Status Codes
Success	0000	Success	The SCP has completed the operation successfully.
*	*	Any other Status Code	The association is aborted and the storage commit is marked as failed.

Table 35. Storage Commitment N-ACTION Communication Failure Behavior

Exception	Behavior
Association setup failure	The Association is aborted and the storage commit marked as failed. The reason is logged and reported in the logfile, accessible via BV-Scope. Items will not be removed from the Storage Commit queue.
Network Timeout behavior	See section 4.4.2 for corresponding configurable Time to wait parameters.

Table 36. Storage Commitment Push Model SOP Class - N-ACTION-RQ - Storage Commitment Module

Attribute Name	Tag	Note
Transaction UID	0008,1195	Generated Unique UID
Referenced SOP Sequence	0008,1199	References to all images sent
>Referenced SOP Class UID	0008,1150	References to all images sent
>Referenced SOP Instance UID	0008,1155	References to all images sent

4.2.1.4. Association Acceptance Policy

4.2.1.4.1. Activity: Receive Storage Commitment Response

4.2.1.4.1.1. Description and Sequencing of Activities

BV Family AE will accept associations in order to receive responses to a Storage Commitment Request.

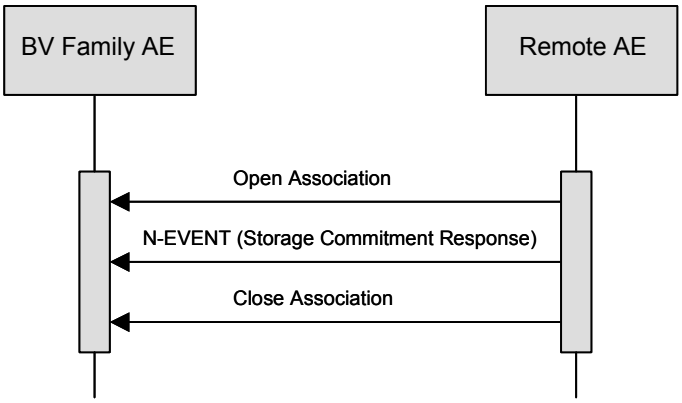

Figure 11. Sequencing of Activity Request Storage Commit

A possible sequence of interactions between the Remote AE and BV Family AE (e.g. a storage or archive device supporting Storage Commitment SOP Classes as an SCP) is illustrated in Figure 11:

1. The Remote AE opens a new association with the BV Family AE.
2. The Remote AE sends an N-EVENT-REPORT request notifying the BV Family AE of the status of a previous Storage Commitment Request. BV Family AE replies with a N-EVENT-REPORT response confirming receipt.
3. The Remote AE closes the association with the BV Family AE.

BV Family AE may reject association attempts as shown in Table 37. The Result, Source and Reason/Diag columns represent the values returned in the appropriate fields of an ASSOCIATE-RJ PDU.

Table 37. Association Rejection Reasons

Result	Source	Reason/Diag.	Explanation
2 – rejected-transient	2 – DICOM UL service provider (presentation releted)	2 – local-limit-exceeded	The maximum number of simultaneous associations has been reached. An association request with the same parameters may succeed at a later time.
2 – rejected-transient	2 – DICOM UL service provider (presentation releted)	1 – temporary-congestion	No associations can be accepted at this time. An association request with the same parameters may succeed at a later time.
1 – rejected-permanent	1 – DICOM UL service-user	2 – application-context-name-not-supported	The association request contained an unsupported Application Context Name. An association request with the same parameters will not succeed at a later time
1 – rejected-permanent	1 – DICOM UL service-user	7 – called-AE-title-not-	The association request contained an unrecognized Called AE Title. This rejection

Result	Source	Reason/Diag.	Explanation
		recognized	reason normally occurs when the association initiator is incorrectly configured and attempts to address the association acceptor using the wrong AE Title.
1 – rejected-permanent	1 – DICOM UL service-user	3 – calling-AE-title-not-recognized	The association request contained an unrecognized Calling AE Title. This rejection reason normally occurs when the association acceptor has not been configured to recognize the AE Title of the association initiator.
1 – rejected-permanent	2 – DICOM UL service provider (ACSE related)	1 – no-reason-given	The association request could not be parsed. An association request with the same format will not succeed at a later time.

4.2.1.4.1.2. Accepted Presentation Contexts

BV Family AE will accept presentation Contexts as shown in Table 38.

TABLE 38. Accepted Presentation Context for activity Receive Storage Commitment Response

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Storage Commitment Push Model	1.2.840.10008.1.20.1	ILE	1.2.840.10008.1.2	SCU	None
		ELE	1.2.840.10008.1.2.1	SCU	None
		EBE	1.2.840.10008.1.2.2	SCU	None

BV Family AE will only accept the SCU role (which must be proposed via SCP/SCU Role Selection Negotiation) within a Presentation Context for the Storage Commitment Push Model SOP Class.

4.2.1.4.1.3. SOP Specific Conformance for Storage Commitment Push SOP Class

The behavior of BV Family AE when receiving Event Types within the N-EVENT-REPORT is summarized in Table 39.

Table 39. Storage Commitment Push Model SOP Class - N-EVENT-REPORT - Behavior

Event Type Name	Event Type ID	Behavior
Storage Commitment Request Successful	1	The Referenced SOP Instances under Referenced SOP Sequence (0008,1199) are marked within the database as “Stored & Committed (SC)” to the value of Retrieve AE Title (0008,0054).
Storage Commitment Request Complete – Failures Exist	2	In case of a “Failure Exist” situation (Referenced SOP Instances under Failed SOP Sequence (0008,1198)), all of the stored SOP Instances for that examination are considered as failed for storage commitment. A send job that failed storage commitment will not be automatically restarted but can be resumed by the user.

The reasons for returning specific status codes in a N-EVENTREPORT response are summarized in Table 40.

.

Table 40. Storage Commitment N-EVENT-REPORT Response Status Handling Behavior

Service Status	Further Meaning	Status Codes	Behaviour of BV Family upon receiving of the Status Codes
Success	Success	0000	The SCP has completed the operation successfully.
Failure	*	Any other Failure Status Code	The association is aborted and the storage commit N-EVENT REPORT is marked as failed.

4.3. Network Interfaces

4.3.1. Physical Network Interface

BV Family AE provides DICOM 3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM 3.0 Standard. The TCP/IP stack is inherited from the Vx Works Operating system.

BV Family AE supports Ethernet and IEEE 802.3, 10/100 BASE-T.

4.3.2. Additional Protocols

No additional protocols are used.

4.4. Configuration

The configuration of a BV Family system is done by means of a Web based service program, called BV-Scope.

4.4.1. AE Title/Presentation Address Mapping

An important installation issue is the translation from AE title to Presentation Address. How this is to be performed is described in this section.

4.4.1.1. Local AE Titles

Per default the BV Family AE Application Entity Title is “No Name”. At installation the Customer Support Engineer can change the host name. The BV Family AE can be changed independently.

TABLE 41. AE Title Configuration Table

Application Entity	Default AE Title	TCP/IP Port
BV Family AE	“No Name”	Fixed: 104

4.4.1.2. Remote AE Title/Presentation Address Mapping

4.4.1.2.1. Remote Association Initiators

The following information must be provided for all relevant remote applications that are able to initiate DICOM associations to BV Family AE:

- The Application Entity Title.
- The host name/IP address on which the remote application resides.
- The port number at which the remote application has to send association requests.

4.4.1.2.2. Remote Association Acceptors

The following information must be provided for all relevant remote applications that are able to accept DICOM associations from BV Family AE:

- The Application Entity Title.
- The host name/IP address on which the remote application resides.
- The port number at which the remote application accepts association requests.

4.4.2. Parameters

The specification of important operational parameters, and if configurable, their default value and range, are specified here.

The configuration parameters are given in Table 42, categorized in the following sections:

- Local system Configurable Parameters of the BV Family AE
- Export Target (Store) Configurable Parameters
- Export Target (Print) Configurable Parameters
- Worklist Management Target Configurable Parameters
- MPPS Target Configurable Parameters

TABLE 42. Configuration Parameters table

Parameter		Configurable	Default Value, comment
Local System Parameters			
AE Title		Yes	“No Name”
Host Name		Yes	“No Name”
IP Address		Yes	0.0.0.0
Subnet Mask		Yes	0.0.0.0
Default Gateway		Yes	0.0.0.0
Interpolation (on/off)		Yes	On
Max. PDU size		Yes	28672
Receive Message Timeout		Yes	60
Association Close Timeout		Yes	1
Association Reply Timeout		Yes	60
Association Release Timeout		Yes	60
Write Timeout		Yes	120
Connect Timeout		Yes	60
Export Target(s) (Store)			
AE Title		Yes	“No Name”
Name		Yes	Max. 25 char. Unique
IP Address		Yes	
Port number		Yes	
Type		Yes	STORE
Storage Commit	AE Title	Yes	“No Name”
	IP Address	Yes	
	Port number	Yes	
	Enable/Disable	Yes	
Export Target(s) (Print)			
AE Title		Yes	“No Name”
Name		Yes	Max. 25 char. Unique
IP Address		Yes	
Port number		Yes	
Type		Yes	PRINT

Parameter	Configurable	Default Value, comment
Printer type	Yes	Predefined List
Printer Priority	Yes	MED
Film Destination	Yes	PROCESSOR
Film Orientation	Yes	PORTRAIT
Film Size	Yes	Depending on Printer Type
Border Density	Yes	BLACK
Border Density Value	Yes	1
Number of Copies	Yes	1
Magnification Type	No	Depending on Printer Type
Smoothing Type	No	Depending on Printer Type
Minimum Density	No	Depending on Printer Type
Maximum Density	No	Depending on Printer Type
Empty Image Density	No	Depending on Printer Type
Polarity	No	Depending on Printer Type
Trim	No	Depending on Printer Type
Configuration Information	No	Depending on Printer Type
Modality Worklist Management Target		
AE Title	Yes	“No Name”
Name	Yes	Max. 25 char. Unique
IP Address	Yes	
Port number	Yes	
Type	Yes	MWL
Select Query	Yes	Predefined Query List, maximum 4 items in the list
Define Query	Yes	Defines the queries that can be selected
MPPS Target		
AE Title	Yes	“No Name”
Name	Yes	Max. 25 char. Unique
IP Address	Yes	
Port number	Yes	
Type	Yes	MPPS
Automatic MPPS	Yes	If configured, always start MPPS panel directly after selection of Export function
Protocol Names	Yes	List with Protocol Names that can be selected in the MPPS panel
Storage commit (N-EVENT-REPORT)		
AE Title	Yes	Local System AE-Title
IP Address	Yes	Local System IP address
Port number	No	Fixed: 8104

Note: Parameters that are part of a specific DICOM IOD are specified in section 4 and 8

5. MEDIA INTERCHANGE

BV Family AE does not support Media Interchange.

6. SUPPORT OF CHARACTER SETS

The BV Family AE supports Extended Character Set “ISO_IR 100”, which is the Latin alphabet No.1, supplementary set.

7. SECURITY

7.1. Security Profiles

Not applicable

7.2. Association level security

Not applicable

7.3. Application level security

- For the DICOM configuration two levels of access are supported by the application: via a password and/or a hardware dongle.

8. ANNEXES

8.1. IOD Contents

8.1.1. Created SOP Instance(s)

The following tables use a number of abbreviations.

The abbreviations used in the “Presence of …” column are:

- VNAP Value Not Always Present (attribute sent zero length if no value is present)
- ANAP Attribute Not Always Present
- ALWAYS Always Present
- EMPTY Attribute is sent without a value

The abbreviations used in the “Source” column:

- MWL the attribute value source Modality Worklist
- USER the attribute value source is from User input
- AUTO the attribute value is generated automatically
- MPPS the attribute value is the same as that used for Modality Performed Procedure Step
- CONFIG the attribute value source is a configurable parameter

8.1.1.1. X-RAY Angiographic Image IOD

Table 43. IOD of Created XA SOP Instances

IE	Module	Reference	Presence of Module
Patient	Patient	Table 55	ALWAYS
Study	General Study	Table 56	ALWAYS
	Patient Study	Table 57	ANAP
Series	General Series	Table 58	ALWAYS
Equipment	General Equipment	Table 59	ALWAYS
Image	General Image	Table 60	ALWAYS
	Image Pixel	Table 61	ALWAYS
	Cine	Table 62	ALWAYS
	Multi-Frame	Table 63	ALWAYS
	X-Ray	Table 64	ALWAYS
	X-Ray Acquisition	Table 65	ALWAYS
	XA Positioner	Table 66	ALWAYS
	SOP Common	Table 67	ALWAYS

8.1.1.2. Secondary Capture Image IOD

Table 44. IOD of Created SC SOP Instances

IE	Module	Reference	Presence of Module
Patient	Patient	Table 45	ALWAYS
Study	General Study	Table 46	ALWAYS
	Patient Study	Table 47	ANAP
Series	General Series	Table 48	ALWAYS
Equipment	General Equipment	Table 49	ALWAYS
	SC Equipment	Table 50	ALWAYS
Image	General Image	Table 51	ALWAYS

IE	Module	Reference	Presence of Module
	Image Pixel	Table 52	ALWAYS
	SC Image	Table 53	ALWAYS
	SOP Common	Table 54	ALWAYS

8.1.1.3. Secondary Capture Image Storage SOP Class

The details of applied modules are given in the tables below. The lists of possible attribute values are given. It is indicated whether Attribute is provided by WLM or entered by the operator.

Table 45. Secondary Capture Image Storage SOP Class - Patient Module

Attribute Name	Tag	Note	Presence of Value	Source
Patient's Name	0010,0010	From Modality Worklist or User Input	ALWAYS	USER/MWL
Patient ID	0010,0020	From Modality Worklist or User Input	ALWAYS	USER/ MWL
Patient's Birth Date	0010,0030	From Modality Worklist or User Input	ALWAYS	USER/ MWL
Patient's Birth Time	0010,0032	From Modality Worklist (format: hhmm)	VNAP	MWL
Patient's Sex	0010,0040	From Modality Worklist or User Input	ALWAYS	USER/ MWL
Other Patient IDs	0010,1000	From Modality Worklist	VNAP	MWL
Other Patient Names	0010,1001	From Modality Worklist	VNAP	MWL

Table 46. Secondary Capture Image Storage SOP Class - General Study Module

Attribute Name	Tag	Note	Presence of Value	Source
Study Date	0008,0020	Exam Date, generated by BV Family	ALWAYS	AUTO
Study Time	0008,0030	Exam Time, generated by BV Family (format: hhmm)	ALWAYS	AUTO
Accession Number	0008,0050	From Modality Worklist or User Input	ALWAYS	USER/ MWL
Referring Physician's Name	0008,0090	From Modality Worklist	VNAP	MWL
Study Description	0008,1030	Examination type selected by the User	ALWAYS	USER
Referenced Study Sequence	0008,1110	From Modality Worklist	VNAP	MWL
>Referenced SOP Class UID	0008,1150	From Modality Worklist	ANAP	MWL
>Referenced SOP Instance UID	0008,1155	From Modality Worklist	ANAP	MWL
Study Instance UID	0020,000D	From Modality Worklist or generated by the BV Family system	ALWAYS	AUTO/MWL
Study ID	0020,0010	Always empty	VNAP	AUTO

Table 47. Secondary Capture Image Storage SOP Class - Patient Study Module

Attribute Name	Tag	Note	Presence of Value	Source
Patient's Weight	0010,1030	From Modality Worklist	VNAP	MWL

Table 48. Secondary Capture Image Storage SOP Class - General Series Module

Attribute Name	Tag	Note	Presence of Value	Source
Modality	0008,0060	Dose Report: “OT” Other Objects: “XA”	ALWAYS	AUTO
Performing Physician's Name	0008,1050	User Input	ALWAYS	USER
Series Instance UID	0020,000E	Generated by BV Family System	ALWAYS	AUTO
Series Number	0020,0011	Increasing number for each run	ALWAYS	AUTO
Laterality	0020,0060	Always empty	EMPTY	
Performed Procedure Step Start Date	0040,0244	Exam Date, generated by BV Family	ALWAYS	AUTO
Performed Procedure Step Start Time	0040,0245	Exam Time, generated by BV Family (format: hhmm)	ALWAYS	AUTO

Table 49. Secondary Capture Image Storage SOP Class - General Equipment Module

Attribute Name	Tag	Note	Presence of Value	Source
Manufacturer	0008,0070	Applied Value(s): Philips Medical Systems	ALWAYS	AUTO
Institution Name	0008,0080	Fixed value (Hospital Name).	ALWAYS	CONFIG
Station Name	0008,1010	Fixed value (Configurable).	ALWAYS	CONFIG
Manufacturer's Model Name	0008,1090	Applied Value(s): BV Family	ALWAYS	AUTO

Table 50. Secondary Capture Image Storage SOP Class - Sc Image Equipment Module

Attribute Name	Tag	Note	Presence of Value	Source
Conversion Type	0008,0064	Applied Value(s): DI	ALWAYS	AUTO
Secondary Capture Device ID	0018,1010	BV System ID	ALWAYS	CONFIG
Secondary Capture Device Manufacturer	0018,1016	Fixed: Philips Medical Systems	ALWAYS	AUTO
Secondary Capture Device Manufacturer's Model Name	0018,1018	Fixed: BV Family	ALWAYS	AUTO
Secondary Capture Device Software Version.	0018,1019	BV Family R1.5	ALWAYS	AUTO

Table 51. Secondary Capture Image Storage SOP Class - General Image Module

Attribute Name	Tag	Note	Presence of Value	Source
Image Type	0008,0008	Applied Value: DERIVED\SECONDARY	ALWAYS	AUTO
Instance Number	0020,0013	Generated running number	ALWAYS	AUTO
Patient Orientation	0020,0020	Always Empty.	EMPTY	

Table 52. Secondary Capture Image Storage SOP Class - Image Pixel Module

Attribute Name	Tag	Note	Presence of Value	Source
Samples per Pixel	0028,0002	Applied Value(s): 1	ALWAYS	AUTO
Photometric Interpretation	0028,0004	Fixed: MONOCHROME2	ALWAYS	AUTO
Rows	0028,0010	See Table 68	ALWAYS	AUTO
Columns	0028,0011	See Table 68	ALWAYS	AUTO
Pixel Aspect Ratio	0028,0034	See Table 68	ANAP	AUTO
Bits Allocated	0028,0100	Applied Value(s): 8	ALWAYS	AUTO
Bits Stored	0028,0101	Applied Value(s): 8	ALWAYS	AUTO
High Bit	0028,0102	Applied Value(s): 7	ALWAYS	AUTO
Pixel Representation	0028,0103	Applied Value(s): 0000	ALWAYS	AUTO
Pixel Data	7FE0,0010	Pixel Data	ALWAYS	AUTO

Table 53. Secondary Capture Image Storage SOP Class - Sc Image Module

Attribute Name	Tag	Note	Presence of Value	Source
Date of Secondary Capture	0018,1012	Generated by BV Family System	ALWAYS	AUTO
Time of Secondary Capture	0018,1014	Generated by BV Family System (format: hhmm)	ALWAYS	AUTO

Table 54. Secondary Capture Image Storage SOP Class - Sop Common Module

Attribute Name	Tag	Note	Presence of Value	Source
Specific Character Set	0008,0005	Applied Value(s): ISO_IR 100	ALWAYS	AUTO
SOP Class UID	0008,0016	Applied Value(s): 1.2.840.10008.5.1.4.1.1.7	ALWAYS	AUTO
SOP Instance UID	0008,0018	Generated by BV Family System	ALWAYS	AUTO

8.1.1.4. X-Ray Angiographic Image Storage SOP Class

The details of applied modules are given in the tables below. The lists of possible attribute values are given. The situation that an attribute is present conditionally/optionally is indicated too.

Table 55. X-Ray Angiographic Image Storage SOP Class - Patient Module

Attribute Name	Tag	Note	Presence of Value	Source
Patient's Name	0010,0010	From Modality Worklist or User Input	ALWAYS	USER/MWL
Patient ID	0010,0020	From Modality Worklist or User Input	ALWAYS	USER/ MWL
Patient's Birth Date	0010,0030	From Modality Worklist or User Input	ALWAYS	USER/ MWL
Patient's Birth Time	0010,0032	From Modality Worklist (format: hhmm)	VNAP	MWL
Patient's Sex	0010,0040	From Modality Worklist or User Input	ALWAYS	USER/ MWL
Other Patient IDs	0010,1000	From Modality Worklist	VNAP	MWL
Other Patient Names	0010,1001	From Modality Worklist	VNAP	MWL

Table 56. X-Ray Angiographic Image Storage SOP Class - General Study Module

Attribute Name	Tag	Note	Presence of Value	Source
Study Date	0008,0020	Exam Date, generated by BV Family	ALWAYS	AUTO
Study Time	0008,0030	Exam Time, generated by BV Family (format: hhmm)	ALWAYS	AUTO
Accession Number	0008,0050	From Modality Worklist or User Input	ALWAYS	USER/ MWL
Referring Physician's Name	0008,0090	From Modality Worklist	VNAP	MWL
Study Description	0008,1030	Examination type selected by the User	ALWAYS	USER
Referenced Study Sequence	0008,1110	From Modality Worklist	VNAP	MWL
>Referenced SOP Class UID	0008,1150	From Modality Worklist	ANAP	MWL
>Referenced SOP Instance UID	0008,1155	From Modality Worklist	ANAP	MWL
Study Instance UID	0020,000D	From Modality Worklist or generated by the BV Family system	ALWAYS	AUTO/MWL
Study ID	0020,0010	Always empty	VNAP	AUTO

Table 57. X-Ray Angiographic Image Storage SOP Class - Patient Study Module

Attribute Name	Tag	Note	Presence of Value	Source
Patient's Weight	0010,1030	From Modality Worklist	VNAP	MWL

Table 58. X-Ray Angiographic Image Storage SOP Class - General Series Module

Attribute Name	Tag	Note	Presence of Value	Source
Modality	0008,0060	“XA”	ALWAYS	AUTO
Performing Physician's Name	0008,1050	User Input	ALWAYS	USER
Series Instance UID	0020,000E	Generated by BV Family System	ALWAYS	AUTO
Series Number	0020,0011	Increasing number for each run	ALWAYS	AUTO
Laterality	0020,0060	Always empty	EMPTY	
Performed Procedure Step Start Date	0040,0244	Exam Date, generated by BV Family	ALWAYS	AUTO
Performed Procedure Step Start Time	0040,0245	Exam Time, generated by BV Family (format: hhmm)	ALWAYS	AUTO

Table 59. X-Ray Angiographic Image Storage SOP Class - General Equipment Module

Attribute Name	Tag	Note	Presence of Value	Source
Manufacturer	0008,0070	Applied Value(s): Philips Medical Systems	ALWAYS	AUTO
Institution Name	0008,0080	Fixed value (Configurable).	ALWAYS	CONFIG
Station Name	0008,1010	Fixed value (Configurable).	ALWAYS	CONFIG
Manufacturer's Model Name	0008,1090	Applied Value(s): BV Family	ALWAYS	AUTO

Table 60. X-Ray Angiographic Image Storage SOP Class - General Image Module

Attribute Name	Tag	Note	Presence of Value	Source
Content Date	0008,0023	Generated by BV Family System	ALWAYS	AUTO
Content Time	0008,0033	Generated by BV Family System (format: hhmm)	ALWAYS	AUTO
Instance Number	0020,0013	Generated by BV Family System	ALWAYS	AUTO
Patient Orientation	0020,0020	Always Empty	EMPTY	

Table 61. X-Ray Angiographic Image Storage SOP Class - Image Pixel Module

Attribute Name	Tag	Note	Presence of Value	Source
Samples per Pixel	0028,0002	Applied Value(s): 1	ALWAYS	AUTO
Photometric Interpretation	0028,0004	Fixed: MONOCHROME2	ALWAYS	AUTO
Rows	0028,0010	See Table 68	ALWAYS	AUTO
Columns	0028,0011	See Table 68	ALWAYS	AUTO
Pixel Aspect Ratio	0028,0034	See Table 68	ANAP	AUTO
Bits Allocated	0028,0100	Applied Value(s): 8	ALWAYS	AUTO
Bits Stored	0028,0101	Applied Value(s): 8	ALWAYS	AUTO
High Bit	0028,0102	Applied Value(s): 7	ALWAYS	AUTO
Pixel Representation	0028,0103	Applied Value(s): 0000	ALWAYS	AUTO
Pixel Data	7FE0,0010	Pixel Data	ALWAYS	AUTO

Table 62. X-Ray Angiographic Image Storage SOP Class - Cine Module

Attribute Name	Tag	Note	Presence of Value	Source
Start Trim	0008,2142	Applied Value: 1	ALWAYS	AUTO
Stop Trim	0008,2143	Number of images in the run	ALWAYS	AUTO
Recommended Display Frame Rate	0008,2144	Acquisition speed	ALWAYS	AUTO
Cine Rate	0018,0040	Calculated from Acquisition Speed	ALWAYS	AUTO
Frame Time	0018,1063	Calculated from Acquisition Speed, in msec	ALWAYS	AUTO

Table 63. X-Ray Angiographic Image Storage SOP Class - Multi-frame Module

Attribute Name	Tag	Note	Presence of Value	Source
Number of Frames	0028,0008	Number of exported images in the run	ALWAYS	AUTO
Frame Increment Pointer	0028,0009	Fixed: 0x00181063	ALWAYS	AUTO

Table 64. X-Ray Angiographic Image Storage SOP Class - X-ray Image Module

Attribute Name	Tag	Note	Presence of Value	Source
Image Type	0008,0008	Applied Value(s): ORIGINAL\PRIMARY	ALWAYS	AUTO
Samples per Pixel	0028,0002	Applied Value(s): 1	ALWAYS	AUTO
Photometric Interpretation	0028,0004	Applied Value(s): MONOCHROME2	ALWAYS	AUTO
Frame Increment Pointer	0028,0009	Frame Time (0018,1063)	ALWAYS	AUTO
Bits Allocated	0028,0100	Applied Value(s): 8	ALWAYS	AUTO
Bits Stored	0028,0101	Applied Value(s): 8	ALWAYS	AUTO

Attribute Name	Tag	Note	Presence of Value	Source
High Bit	0028,0102	Applied Value(s): 7	ALWAYS	AUTO
Pixel Representation	0028,0103	Applied Value(s): 0000	ALWAYS	AUTO
Pixel Intensity Relationship	0028,1040	Applied Value(s): LIN	ALWAYS	AUTO

Table 65. X-Ray Angiographic Image Storage SOP Class - X-ray Acquisition Module

Attribute Name	Tag	Note	Presence of Value	Source
KVP	0018,0060	Always Empty.	EMPTY	
Field of View Shape	0018,1147	Applied Value(s): ROUND	ALWAYS	AUTO
Exposure	0018,1152	Always Empty.	EMPTY	
Radiation Setting	0018,1155	Applied Value(s): GR, SC	ALWAYS	AUTO
Type of Filters	0018,1161	Applied Value(s): NONE	ALWAYS	AUTO
Intensifier Size	0018,1162	Applied Value(s): 150, 230, 310	ALWAYS	AUTO
Grid	0018,1166	Applied Value(s): IN	ALWAYS	AUTO

Table 66. X-Ray Angiographic Image Storage SOP Class – XA Positioner Module

Attribute Name	Tag	Note	Presence of Value	Source
Distance Source to Detector	0018,1110	Applied Value(s): 995	ALWAYS	AUTO
Positioner Motion	0018,1500	Always Empty	EMPTY	
Positioner Primary Angle	0018,1510	Applied Value(s): 0	ALWAYS	AUTO
Positioner Secondary Angle	0018,1511	Applied Value(s): 0	ALWAYS	AUTO

Table 67. X-Ray Angiographic Image Storage SOP Class - Sop Common Module

Attribute Name	Tag	Note		
Specific Character Set	0008,0005	Applied Value(s): ISO_IR 100	ALWAYS	AUTO
SOP Class UID	0008,0016	Applied Value: 1.2.840.10008.5.1.4.1.1.12.1	ALWAYS	AUTO
SOP Instance UID	0008,0018	Generated by the BV Family System	ALWAYS	AUTO

8.1.1.5. Overview of the applied values for Rows, Columns and aspect ratio

The actual pixel matrix used in case of exporting objects as mentioned in sections 8.1.1.5 and 8.1.1.6 depends on the “interpolation” parameter for the particular export target. Table 68 shows the values used by the BV Family AE.

Table 68. Applied values for Rows, Columns and Aspect Ratio

Interpolation – Image Type	Rows	Colums	Pixel Aspect Ratio
On - Secondary Capture	768	1008	Not sent
On - XA Image	768	792	Not sent
Off - Secondary Capture	560	1008	753\549
Off - XA Image	560	792	753\549

8.1.2. Usage of Attributes from received IODs

This section specifies each IOD that in case it is received by the BV Family system can influence the system behavior. It specifies the attribute name, tag and value. Also an explanation of the behavior is given.

8.1.2.1. Printer SOP Class

Table 69. Printer SOP Class - N-GET-RQ - Printer Module

Attribute Name	Tag	Note
Printer Status	2110,0010	Displayed in user interface. Applied Value(s): FAILURE, NORMAL, WARNING
Printer Status Info	2110,0020	

Only in case the printer Target responds with a Printer Status of “NORMAL” or “WARNING” the BV Family AE starts to export the actual printing of the images.

8.2. Standard Extended/Specialized/Private SOPs

No private Extended/Specialized/Private Transfer Syntaxes are supported by the system.

8.3. Private Transfer Syntaxes

No private Transfer Syntaxes are supported by the system.