DICOM

Conformance Statement

BV Family software R2.1
with integrated
VF Surgical Workstation

PHILIPS

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1 DICOM CONFORMANCE STATEMENT OVERVIEW

The BV Family R2.1 with integrated VF Surgical Workstation, later referred to as BV Family, is a mobile surgical X-ray image generating system. Members of the BV family product line are: BV Endura and BV Pulsera.

The BV Family implements a worklist management function to communicate with a RIS/HIS, an export function to transfer image data from the local system to a remote system, and a allocated function to print image data from the local system. The integrated surgical workstation offers an additional viewing function for images from the local system, images retrieved from remote systems, and images read from DVD. Viewed images can be written to DVD.

Thus the BV Family provides the following DICOM data exchange features:

- Print images from the local database on a DICOM printer (Standard DICOM package).
- Export images from the local database to a remote database (Standard DICOM package).
- Automatically send a storage commitment request (Advanced DICOM package).
- Query an information system for a modality worklist (Advanced DICOM package).
- Send Modality Performed Procedure Step details to an information system (Advanced DICOM package).
- Query and retrieve images from a remote database (Surgical Workstation).
- Read and write DICOM media (Surgical Workstation).

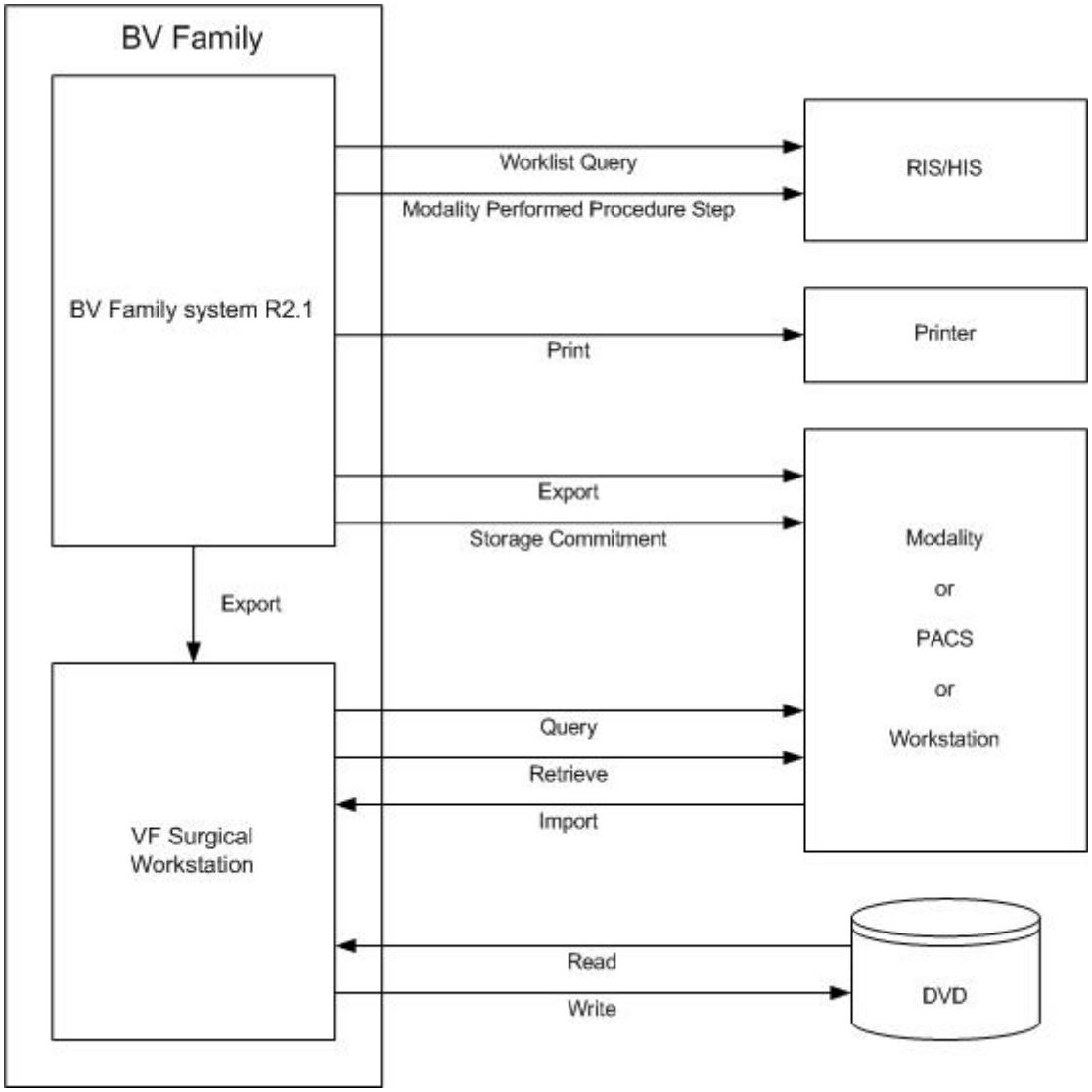

Figure 1: System Overview of the BV Family

Table 1 provides an overview of all network services as provided by the BV Family.

Table 1: Network Services

SOP Class		User of Service (SCU)	Provider of Service (SCP)
Name	**UID**		
Transfer			
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	No	Yes
Digital X-Ray Image Storage – for Presentation	1.2.840.10008.5.1.4.1.1.1.1	No	Yes
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	No	Yes
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	No	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	No	Yes
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	No	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	Yes
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	No	Yes
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	No	Yes
Specialized X-Ray	1.3.46.670589.2.3.1.1	No	Yes
CX Image	1.3.46.670589.2.4.1.1	No	Yes
3D Volume Storage	1.3.46.670589.5.0.1.1	No	Yes
3D Volume Object Storage	1.3.46.670589.5.0.2.1	No	Yes
Surface Storage	1.3.46.670589.5.0.3.1	No	Yes
MR Cardio Storage	1.3.46.670589.5.0.8.1	No	Yes
CT Synthetic Image	1.3.46.670589.5.0.9	No	Yes
MR Synthetic Image	1.3.46.670589.5.0.10	No	Yes
MR Cardio Analysis Storage	1.3.46.670589.5.0.11.1	No	Yes
CX Synthetic Image	1.3.46.670589.5.0.12	No	Yes
Perfusion	1.3.46.670589.5.0.13	No	Yes
Perfusion Analysis	1.3.46.670589.5.0.14	No	Yes
Query/Retrieve			
Patient Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	Yes	No
Patient Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.1.2	Yes	No
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	No
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	No
Patient/Study Only Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.3.1	Yes	No
Patient/Study Only Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.3.2	Yes	No
Workflow Management			
Storage Commitment Push Model	1.2.840.10008.1.20.1	Option	No
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Option	No
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Option	No
Print Management			
Basic Grayscale Print Management (Meta)	1.2.840.10008.5.1.1.9	Yes	No
> Basic Film Session	1.2.840.10008.5.1.1.1	Yes	No
> Basic Film Box	1.2.840.10008.5.1.1.2	Yes	No
> Basic Grayscale Image Box	1.2.840.10008.5.1.1.4	Yes	No
> Printer	1.2.840.10008.5.1.1.16	Yes	No

The Transfer SCU and Print Management SCU services are part of the Standard DICOM package. (Note that this package is optional though required for DICOM functionality.)
The optional Workflow Management SCU services, the Modality Performed Procedure Step and the storage commitment request are part of the Advanced DICOM package.
The Transfer SCP and Query/Retrieve SCU services are part of the optional integrated VF Surgery Workstation.

Table 2 provides an overview of all media services as provided by the BV Family.

Table 2: Media Services

Media Storage Application Profile	Write Files		Read Files	Supported Media
	(FSC)	(FSU)	(FSR)	
DVD				
General Purpose DVD Interchange with JPEG	YES	NO	YES	DVD + R / DVD + RW
	NO	NO	YES	DVD - R / DVD - RW

Note: After data is written to DICOM media DVD+R / DVD+RW, the media is not finalized. Finalizing (Compatible with the DLA tool in ViewForm) will make the disc readable in many drives and need to be done by the user manually.

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3 INTRODUCTION

3.1 Revision History

Table 3: Revision History

Document Version	Date of Issue	Author	Description
3.0	08.sept 2006	PMS C&S-IO	Final version of the DICOM Conformance Statement for BV Family R2.1 with integrated VF Surgical Workstation.

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.

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 Philips equipment with 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 [DICOM] PS 3.3 and PS 3.4.
The word Philips in this document refers to Philips Medical Systems.

The following acronyms and abbreviations are used in this document.

AE	Application Entity
AP	Application Profile
BV Family	BV Family R2.1 with integrated VF Surgical Workstation
BWLM	Basic Worklist Management (service)
DFI	Digital Fluoroscopy Imaging
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DVD	Digital Versatile Disc
EBE	DICOM Explicit VR Big Endian
ELE	DICOM Explicit VR Little Endian
FSC	File-set Creator
FSR	File-set Reader
FSU	File-set Updater
GUI	Graphic User Interface
HIS	Hospital Information System
ILE	DICOM Implicit VR Little Endian
IOD	Information Object Definition
MPPS	Modality Performed Procedure Step
NEMA	National Electrical Manufacturers Association
PDU	Protocol Data Unit
PS	Presentation State
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
VF	ViewForum
WLM	Worklist Management
XA	X-Ray Angiographic

3.5 References

[DICOM] Digital Imaging and Communications in Medicine (DICOM), Part 1 – 18 (NEMA PS 3.1 – PS 3.18),
National Electrical Manufacturers Association (NEMA)
Publication Sales 1300 N. 17th Street, Suite 1847
Rosslyn, Virginia. 22209, United States of America

Note that at any point in time the official standard consists of the most recent yearly edition of the base standard (currently 2006) PLUS all the supplements and correction items that have been approved as Final Text.

[VFRB] Release Bulletin ViewForum 4.1, 4522 981 27301, PMSN

4 NETWORKING

4.1 Implementation model

4.1.1 Application Data Flow

The BV Family consists of two application entities: the BV Family AE and the VF Surgical Workstation AE.

The BV Family AE is responsible for all networking functionality concerning acquisitions by the BV Family. It consists of two packages (ref. Section 1): the (optional) Standard DICOM package, and the Advanced DICOM package as an optional extension to the Standard DICOM package. Using both packages the BV Family AE offers the following functionality.

The operator can send a worklist query. (Get Worklist)

The operator can select and perform an examination (may be scheduled per worklist), resulting in an MPPS record. Then the operator can export the acquisition images; the images in the examination may be transmitted as separate Secondary Capture images or as XA images. If applicable, the BV Family AE automatically sends a Storage Commitment request for those images. The operator can also send a selection of images to a DICOM printer. (Export)

In service mode the service operator can verify application level communication. (Check application level communication)

The VF Surgical Workstation AE is included to view images. Those images may be imported from the BV Family AE, or from a foreign storage SCU. (Query/Retrieve Image)

The BV Family can work both on-line and off-line. Therefore MPPS data and acquired images that have to be transferred by the BV Family AE are put in a queue (so only for RWA (Export)
If the BV Family is connected to the network, then all queued jobs will be executed immediately.
If the BV Family is disconnected from the network, then Query/Retrieve and Worklist Queries are disabled. MPPS, storage, and print jobs will stay in the queue. When the system is connected to the network again, the user can resume the queued jobs. Then the jobs in the queue will be executed (FIFO).

The networking application data flow is shown in Figure 2.

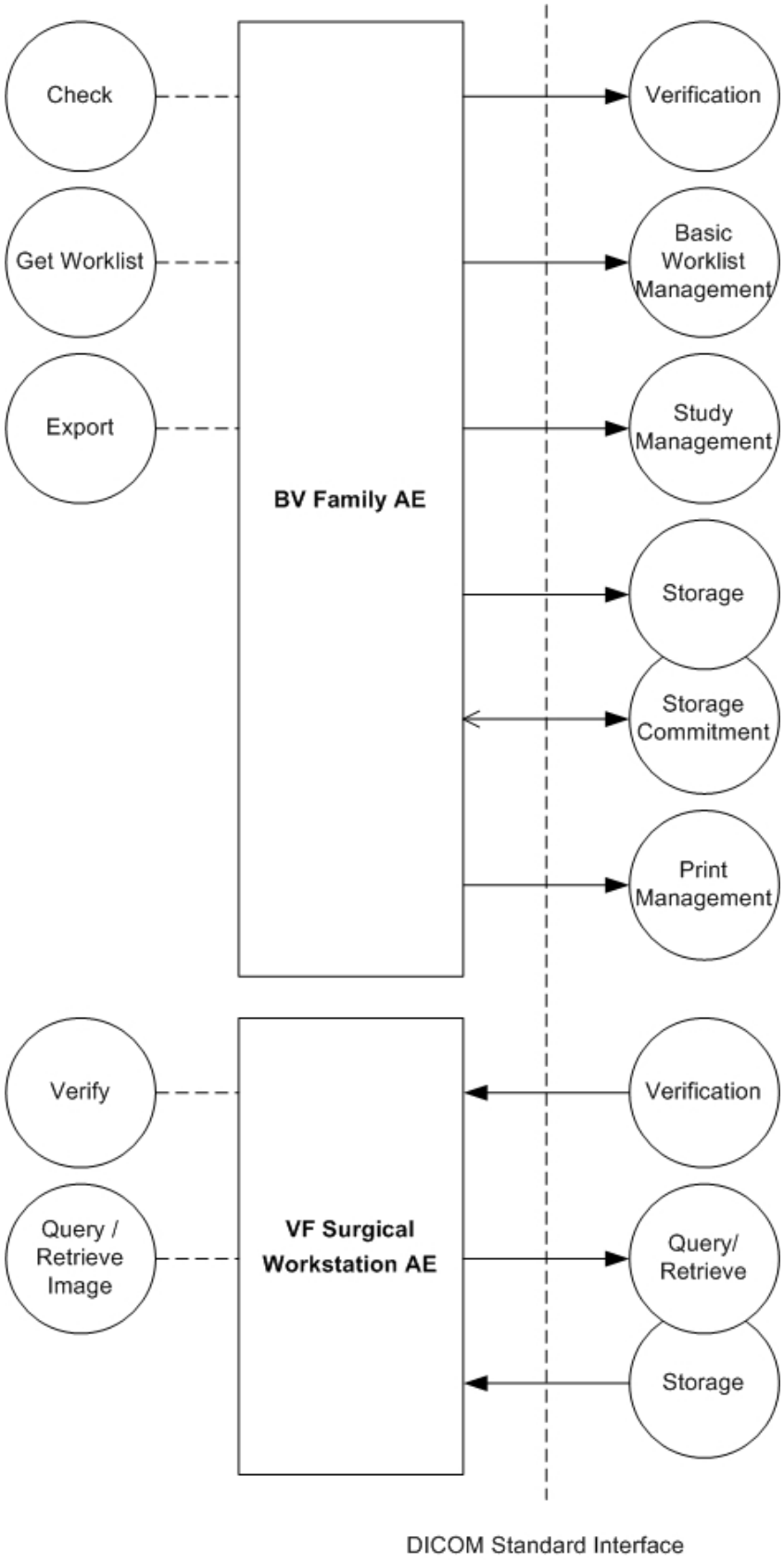

Figure 2: Application Data Flow Diagram

4.1.2 Functional Definition of AE's

4.1.2.1 Functional Definition of the BV Family AE

The BV Family AE has no SCP implementation, and will act as SCU for Verification, for Basic Worklist Management (Get Worklist), and for Study Management, Storage and Storage Commitment, and Print Management (Export). Initiated by the operator the BV Family AE will propose the required presentation contexts for an association with the peer SCP. For Storage Commitment the BV Family AE may accept associations for asynchronous event reports.

4.1.2.2 Functional Definition of the VF Surgical Workstation AE

The VF Surgical Workstation AE can retrieve and view images from a foreign storage SCU (Query/Retrieve Image). The operator initiates a query request and selects examinations from the query response. The operator initiates a retrieve request for the selected images. The VF Surgical Workstation AE as storage SCP waits for an association to import the requested images.

4.1.3 Sequencing of Real-World Activities

The following illustration describes the sequencing constraints of a typical acquisition of a scheduled procedure step.

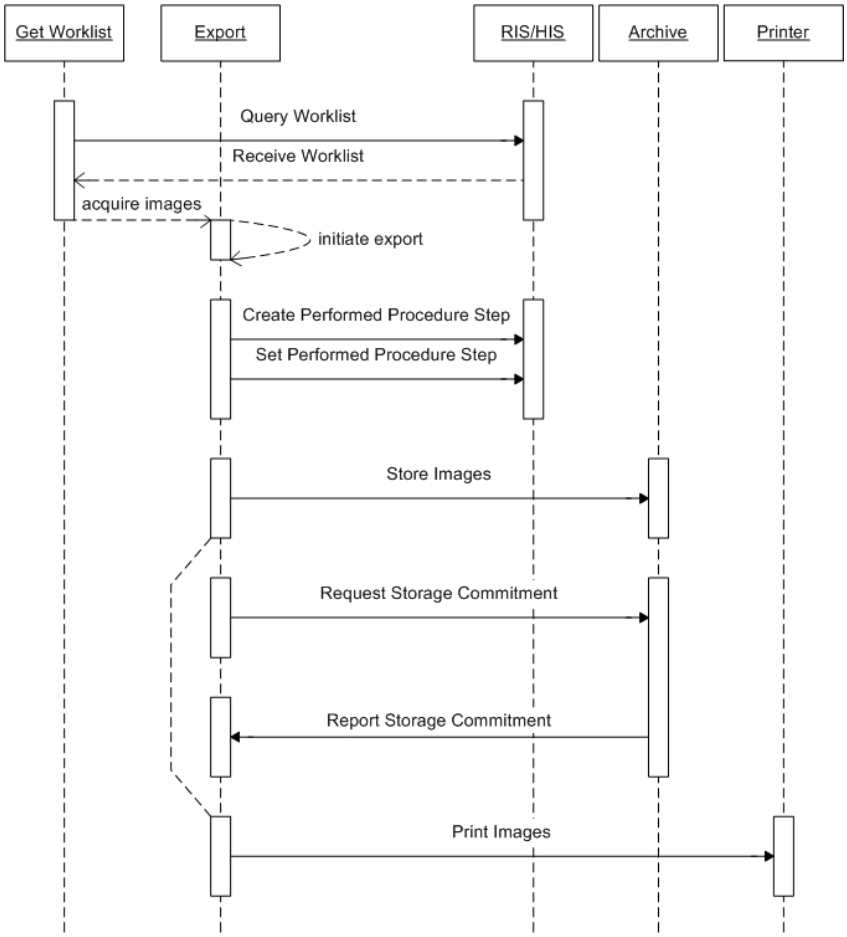

Figure 3: Typical Acquisition Sequencing Constraint

Note that an acquisition may also be started manually, i.e. without using a worklist. and the acquired images may be exported and printed manually too.

The following illustration describes the sequencing constraints of a typical Query/Retrieve action.

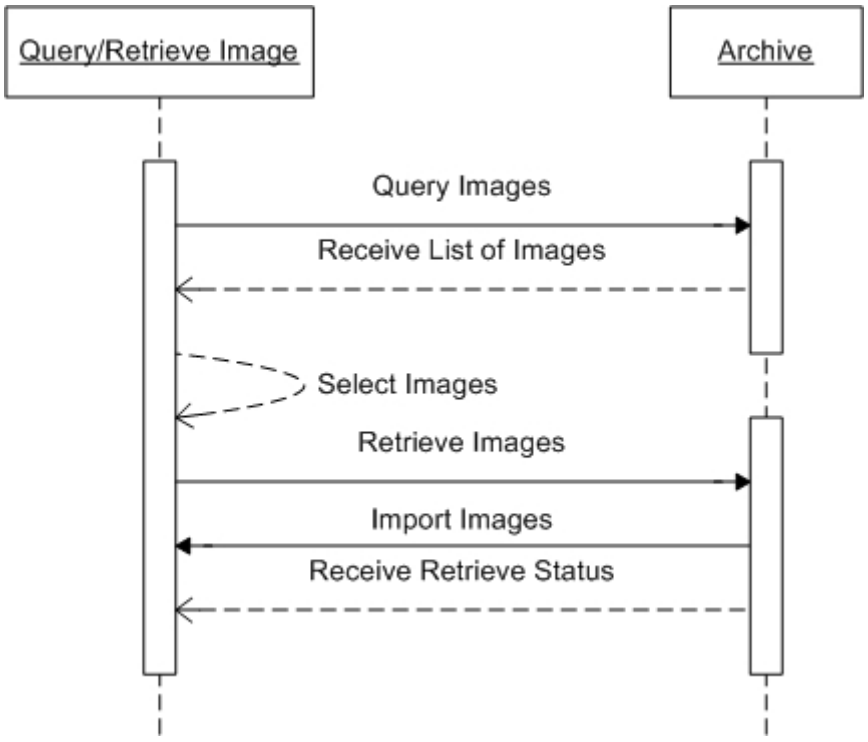

Figure 4: Typical Query/Retrieve Sequencing Constraint

Note that Import Images will be using a separate association.

4.2 AE Specifications

4.2.1 BV Family AE

4.2.1.1 SOP Classes

This application entity provides standard conformance to the following SOP classes.

Table 4: SOP Classes for BV Family AE

SOP Class Name	SOP Class UID	SCU	SCP
WORKLIST			
Verification	1.2.840.10008.1.1	Yes	No
Storage Commitment Push Model	1.2.840.10008.1.20.1	Yes	No
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Yes	No
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Yes	No
PRINTING			
Basic Grayscale Print Management (Meta)	1.2.840.10008.5.1.1.9	Yes	No
> Basic Film Session	1.2.840.10008.5.1.1.1	Yes	No
> Basic Film Box	1.2.840.10008.5.1.1.2	Yes	No

SOP Class Name	SOP Class UID	SCU	SCP
> Basic Grayscale Image Box	1.2.840.10008.5.1.1.4	Yes	No
> Printer	1.2.840.10008.5.1.1.16	Yes	No
STORAGE			
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	No
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	No

4.2.1.2 Association Policies

4.2.1.2.1 General

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

Table 5: DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1

4.2.1.2.2 Number of Associations

The BV Family AE may initiate and accept one association simultaneously.

Table 6: Number of Associations as an Association Initiator for BV Family AE

Maximum number of simultaneous associations	1

Table 7: Number of Associations as an Association Acceptor for BV Family AE

Maximum number of simultaneous associations	1

4.2.1.2.3 Asynchronous Nature

The BV Family AE only supports asynchronous operations for Storage Commitment report. It will not perform asynchronous window negotiation.

4.2.1.2.4 Implementation Identifying Information

For identification of the BV Family AE the following Implementation Class UID and Implementation Version Name are supplied.

Table 8: DICOM Implementation Class and Version for BV Family AE

Implementation Class UID	1.3.46.670589.8.15.2.1
Implementation Version Name	BV Family R2.1

4.2.1.2.5 Communication Failure Handling

The behavior of the AE during communication failure is summarized in Table 9.

Table 9: Communication Failure Behavior

Exception	Behavior
General	In the DFI the error is logged including a description of the problem. Those are the standard notifications when an association cannot be established.
Not connected	MC_NETWORK_SHUTDOWN is logged.

4.2.1.3 Association Initiation Policy

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

Table 10: DICOM Command Communication Failure Behavior

Exception	Behavior
Association setup failure	The association is aborted and the command marked as failed. The reason is logged and reported in the log file.
Network timeout behavior	See section 4.4.1.2.1 for corresponding configurable time to wait parameters.

4.2.1.3.1 Check

4.2.1.3.1.1 Description and Sequencing of Activities

In service mode the BV Family AE can send a verification request (C-ECHO) to verify application level communication. This verification is initiated on a separate service system by using the “check” function of the BV Scope program.

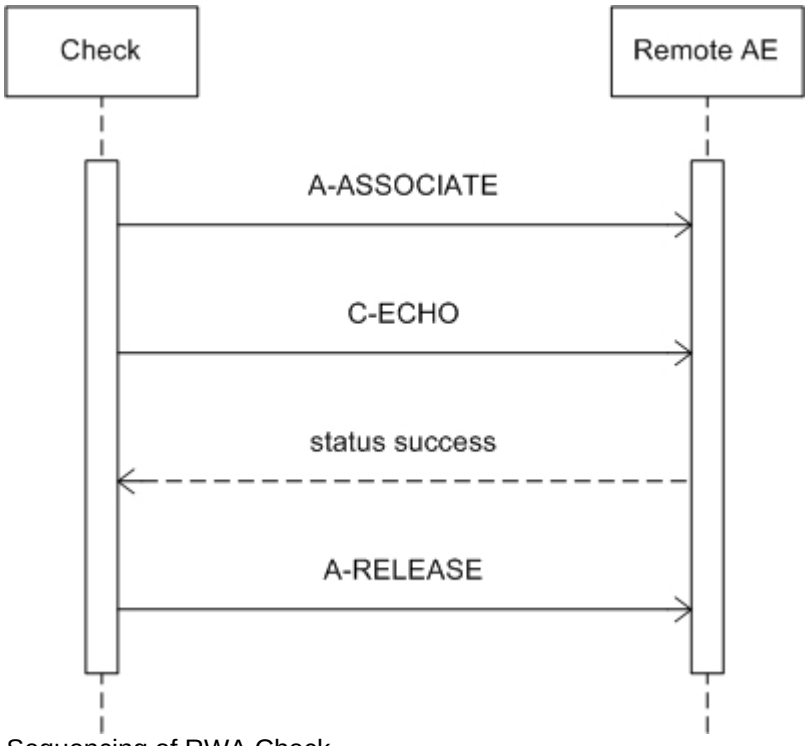

Figure 5: Sequencing of RWA Check

4.2.1.3.1.2 Proposed Presentation Contexts

For Check the BV Family AE will propose the following presentation contexts.

Table 11: Proposed Presentation Contexts for Check

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

4.2.1.3.1.3 SOP Specific Conformance for SOP Classes

4.2.1.3.1.3.1 Verification

The BV Family AE provides standard conformance to the Verification service class.

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 12.

Table 12: C-ECHO Command Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Success	0000	Confirmation	The SCP has successfully returned a verification response.

4.2.1.3.2 Get Worklist

4.2.1.3.2.1 Description and Sequencing of Activities

The BV Family AE can send a modality worklist query (C-FIND) to update the BV Family worklist.

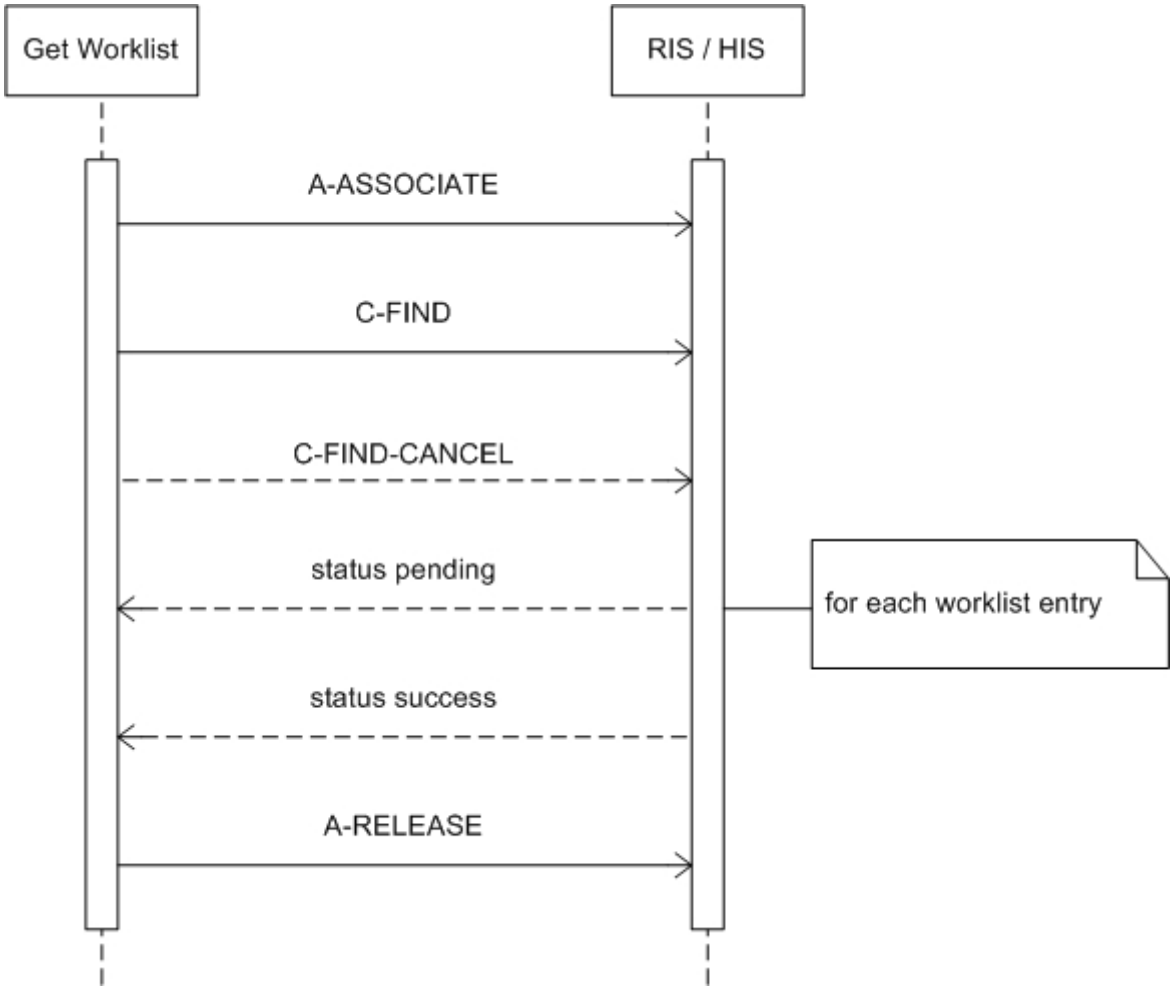

Figure 6: Sequencing of RWA Get Worklist

The worklist query is initiated by selecting “Get Worklist”. Then the BV Family AE opens an association and sends a modality worklist query. The BWLM SCP (RIS/HIS) returns the applicable worklist; a response with status Pending is received for each new entry, the final response has status Success. After the final response the BV Family AE releases the association.

The contents of the received worklist are compared with the contents of the previous worklist. In case there are any changes, the BV Family patient file is updated. A unique match of the following attributes identifies a worklist entry.

Table 13: Matching Criteria for Identifying Worklist Entries

Attribute		
Name	**Tag**	**Comment**
Scheduled Procedure Step ID	(0040,0009)	
Accession Number	(0008,0050)	
Requested Procedure ID	(0040,1001)	

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

4.2.1.3.2.2 Proposed Presentation Contexts

For Get Worklist the BV Family AE will propose the following presentation contexts.

Table 14: Proposed Presentation Contexts for Get Worklist

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Worklist Information Model – FIND	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
Modality Performed Procedure Step	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

4.2.1.3.2.3 SOP Specific Conformance for SOP Classes

4.2.1.3.2.3.1 Modality Worklist Information Model – FIND

The BV Family AE provides standard conformance to the Modality Worklist SOP class. Table 15 provides a description of the BV Family AE worklist request identifier.

Table 15: 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

Attribute Name	Tag	VR	M	R	DW	DP	IOD
>Scheduled Station AE Title	0040,0001	AE	S				
>Scheduled Procedure Step Start Date	0040,0002	DA	R		x		
>Scheduled Procedure Step Start Time	0040,0003	TM		x	x		
>Scheduled Performing Physician's Name	0040,0006	PN		x		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		x		
>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
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’s 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 (today +/- 1 day). Optionally, additional matching for the own AET and/or own Station Name is configurable.

The BV Family AE can contain a number of 18 worklist entries. If the sum of current and new worklist entries exceeds 20 then the BV Family AE will release the association immediately using RELEASE-RQ. The message of the BV Family AE will be, that the maximum number of examinations is reached.

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 16.

Table 16: C-FIND Command Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Success	0000	Matching is complete – No final identifier is supplied	The association is released and the matches are stored.
Failure	A700	Refused – Out of resources	Processing of the matches and the association is terminated. A message appears in the GUI.
	A900	Failed – Identifier does not match SOP class	The association is terminated and the status is logged into the system error log. A message appears in the GUI.
	Cxxx	Failed – Unable to process	Processing of the matches and the association is terminated. A message appears in the GUI.
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 optional keys were not supported for existence for this identifier	Processing of the matches continues without any warnings or errors.

4.2.1.3.3 Export

4.2.1.3.3.1 Description and Sequencing of Activities

After an acquisition the BV Family AE sends related MPPS data to a Study Management SCP (RIS/HIS). Then the acquired image is stored and printed according the settings as specified by the operator.

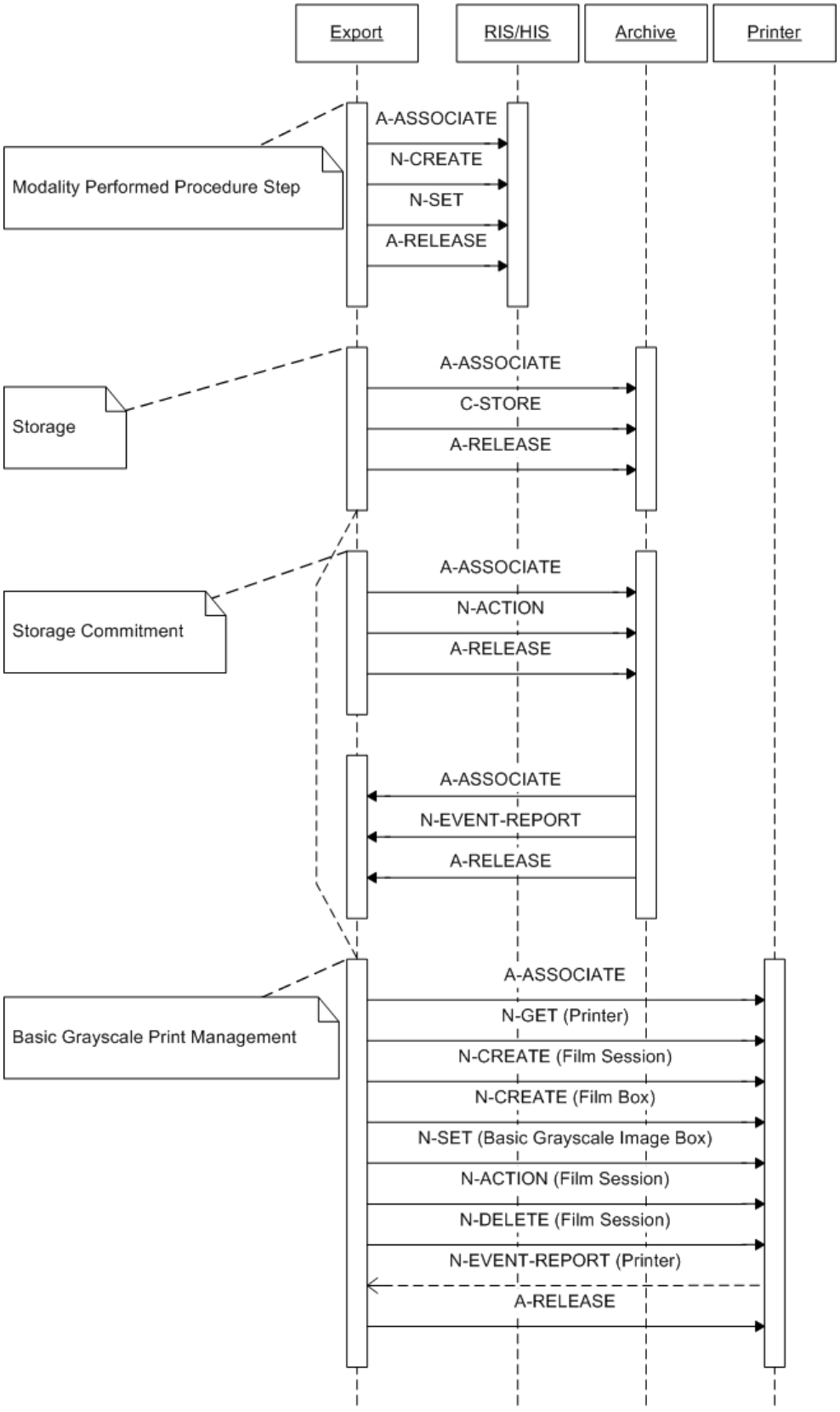

Figure 7: Sequencing of RWA Export

The acquisition is initiated by selecting an examination for export. After selecting "MPPS & OK" the protocol name and study status have to be selected. Then the BV Family AE opens an association and sends an N-CREATE service request, followed by an N-SET service request, and then releases the association.
If the operator specified export to a storage SCP then the BV Family AE opens a new association and sends a C-STORE service request, and then releases the association. If Storage Commitment is enabled then the BV Family AE opens another association to send an N-ACTION service request, and then releases the association. When the Storage Commitment SCP requests an association, the BV Family AE will accept an association for the N-EVENT-REPORT service request (ref. section 4.2.1.3.3.3.3).
Meanwhile, if the operator specified export to a print SCP then the BV Family AE opens a new association to send the printer service requests, and then releases the association.

4.2.1.3.3.2 Proposed Presentation Contexts

For Export the BV Family AE will propose the following presentation contexts.

Table 17: Proposed Presentation Contexts for Study Management

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	ELE ILE EBE	1.2.840.10008.1.2.1 1.2.840.10008.1.2 1.2.840.10008.1.2.2	SCU	None
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	ELE ILE EBE	1.2.840.10008.1.2.1 1.2.840.10008.1.2 1.2.840.10008.1.2.2	SCU	None

Table 18: Proposed Presentation Contexts for Storage

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

Table 19: Proposed Presentation Contexts for Storage Commitment

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

Table 20: Proposed Presentation Contexts for Print Management

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Basic Grayscale Print Management (Meta)	1.2.840.10008.5.1.1.9	ELE ILE EBE	1.2.840.10008.1.2.1 1.2.840.10008.1.2 1.2.840.10008.1.2.2	SCU	None
Printer	1.2.840.10008.5.1.1.16	ELE ILE EBE	1.2.840.10008.1.2.1 1.2.840.10008.1.2 1.2.840.10008.1.2.2	SCU	None
Basic Film Session	1.2.840.10008.5.1.1.1	ELE ILE EBE	1.2.840.10008.1.2.1 1.2.840.10008.1.2 1.2.840.10008.1.2.2	SCU	None
Basic Film Box	1.2.840.10008.5.1.1.2	ELE ILE EBE	1.2.840.10008.1.2.1 1.2.840.10008.1.2 1.2.840.10008.1.2.2	SCU	None
Basic Grayscale Image Box	1.2.840.10008.5.1.1.4	ELE ILE EBE	1.2.840.10008.1.2.1 1.2.840.10008.1.2 1.2.840.10008.1.2.2	SCU	None

4.2.1.3.3.3 SOP Specific Conformance for SOP Classes

4.2.1.3.3.3.1 Modality Performed Procedure Step

The BV Family AE provides standard conformance to the Modality Performed Procedure Step SOP class. Table 21 provides a description of the BV Family AE MPPS request identifier for N-CREATE and N-SET services.

Table 21: MPPS Request Identifiers

Attribute Name	Tag	VR	N-CREATE	N-SET
SOP Common Module				
Specific Character Set	0008,0005	CS	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

Attribute Name	Tag	VR	N-CREATE	N-SET
>Retrieve AE Title	0008,0054	AE	-	EMPTY
>Series Description	0008,103E	LO	-	EMPTY
>Performing Physician's Name	0008,1050	PN	-	Copied from scheduled performing physician's name if this provided by MWL or can be entered by Operator.
>Operator's Name (Performing Technologist)	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	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	Value: 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	-

Attribute Name	Tag	VR	N-CREATE	N-SET
>>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	-
Radiation Dose Module				
Image Area Dose Product	0018,115E	DS	Value: 0	x
Total Time of Fluoroscopy	0040,0300	US	Value: 0	x
Total Number of Exposures	0040,0301	US	Value: 0	x
Entrance Dose	0040,0302	US	Value: 0	x
Entrance dose in mGy	0040,8302	DS	Value: 0	x

Note:
"-" indicates that the attribute is not sent;
"EMPTY" indicates that the attribute is sent with zero length;
"X" or an explicit value indicates that the attribute is sent with an appropriate value.

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 22 and Table 23.

Table 22: N-CREATE Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Success	0000	Success	The SCP has completed the MPPS service request successfully.
Failure	0105	No such attribute	The association is aborted and the MPPS service request is marked as failed in the export queue.
	0110	Processing failure – Performed procedure step object may no longer be updated	The association is aborted and the MPPS service request is marked as failed in the export queue.
Warning	0107	Attribute list error	The MPPS service request is considered successful.
	0116	Attribute value out of range	The MPPS service request is considered successful.

Table 23: N-SET Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Success	0000	Success	The SCP has completed the MPPS service request successfully.
Failure	0105	No such attribute	The association is aborted and the MPPS service request is marked as failed in the export queue.
	0110	Processing failure – Performed procedure step object may no longer be updated	The association is aborted and the MPPS service request is marked as failed in the export queue.
Warning	0107	Attribute list error	The MPPS service request is considered successful.
	0116	Attribute value out of range	The MPPS service request is considered successful.

4.2.1.3.3.2 Storage

The BV Family AE provides standard conformance to the Storage SOP classes.

Note that a Secondary Capture Series can contain one or more Secondary Capture images, where an XA Series can contain only one XA image of one or more frames.

Upon receiving a C-STORE response with status Error or Refused, the BV Family AE will release the association. The transfer of all of the selected images of the examination will be considered failed. The operator may retry export jobs manually.

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 24.

Table 24: C-STORE Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Success	0000	Success	The SCP has completed the Storage service request successfully.
Failure	A7xx	Refused – Out of resources	Image transfer is considered failed. Images remain in queue. User can initiate retry. Status is logged in system file.
	A9xx	Error – Data set does not match SOP class	Image transfer is considered failed. Images remain in queue. User can initiate retry. Status is logged in system file.
	C000	Error – Cannot understand	Image transfer is considered failed. Images remain in queue. User can initiate retry. Status is logged in system file.
Warning	B000	Coercion of data elements	Image transfer is considered successful. Status is logged in system file.
	B006	Elements discarded	Image transfer is considered successful. Status is logged in system file.
	B007	Data set does not match SOP class	Image transfer is considered successful. Status is logged in system file.

4.2.1.3.3.3 Storage Commitment

The BV Family AE provides standard conformance to the Storage Commitment Push Model SOP class for Asynchronous storage commitment.

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 25.

Table 25: N-ACTION Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Success	0000	Success	The SCP has completed the Storage Commitment service request successfully.
Abort	xxxx	Any other status code	The association is aborted and the storage commitment is marked as failed.

The following table lists the contents of the N-ACTION request.

Table 26: Storage Commitment N-ACTION Request Identifiers

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

4.2.1.3.3.4 Basic Grayscale Print Management

Based on the selected layout, the BV Family AE will create a Film Session containing a single Film Box. The content of the Image Box will be filled for the print request (Film Box level). Once the print session has completed the Film Session will be deleted. A new Film Box is created for each successive film within the Film Session.

The BV Family AE is implemented to acquire grayscale images and thus to negotiate for Basic Grayscale Print Management. The processing of a print job can be cancelled at any time; then the BV Family AE will abort the processing immediately.

Before a queued print job 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 BV Family AE does not start the export job.

Upon receiving a print command response with failure status, the BV Family AE will release the association. The transfer of all of the selected images of the examination will be considered failed. The operator may retry export jobs manually.

The BV Family AE cannot handle any N-EVENT-REPORT printer messages.
The following DIMSE services have been implemented.

Table 27: Basic Grayscale Print Management DIMSE Services

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 Grayscale Image Box SOP Class	N-SET

The implemented attributes can be found sorted per IOD module in next the tables.
The following abbreviations are used:

ALWAYS	Attribute shall always present
USER	Attribute value source is explicit user input
AUTO	Attribute value is generated dynamic automatically
CONFIG	Attribute value source is a configurable parameter

Table 28: 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

Note: Only in case that the printer responds with a Printer status of "NORMAL" or "WARNING" the BV Family AE continues printing of the images.

Table 29: 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 30: 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 31: 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 Class UID	0008,1150	UI	Applied Value(s): 1.2.840.10008.5.1.1.1	ALWAYS	AUTO
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	PRINTER

Table 32: 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	Applied Value(s): Always 1024	ALWAYS	AUTO
> Columns	0028,0011	US	Applied Value(s): Always 1280	ALWAYS	AUTO
> Pixel Aspect Ratio	0028,0034	IS	Not send, because is 1 / 1	ANAP	AUTO
> Bits Allocated	0028,0100	US	Applied Value(s): 16	ALWAYS	AUTO
> Bits Stored	0028,0101	US	Applied Value(s): 12	ALWAYS	AUTO
> High Bit	0028,0102	US	Applied Value(s): 11	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

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 33 to Table 36.

Table 33: Basic Film Session N-CREATE Response Status Handling Behavior

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 34: Basic Film Box N-CREATE Response Status Handling Behavior

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 35: Basic Grayscale Image Box N-SET Response Status Handling Behavior

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 36: Basic Film Session N-ACTION Response Status Handling Behavior

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.

4.2.1.4 Association Acceptance Policy

The AE association rejection policies are summarized in Table 37.

Table 37: DICOM Association Rejection Policies

Result	Source	Reason/Diagnosis	Explanation
1 – rejected-permanent	1 – DICOM UL service-user	1 – no-reason-given	-
		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.
		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.
		7 – called-AE-title-not-recognized	The association request contained an unrecognized Called AE Title. This rejection reason normally occurs when the association initiator is incorrectly configured and attempts to address the association acceptor using the wrong AE Title.
	2 – DICOM UL service-provider (ACSE related function)	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.
		2 – protocol-version-not-supported	-
	3 – DICOM UL service-provider (presentation related function)	1 – temporary-congestion	-
		2 – local-limit-exceeded	-

Result	Source	Reason/Diagnosis	Explanation
2 – rejected-transient	1 – DICOM UL service-user	1 – no-reason-given	-
		2 – application-context-name-not-supported	-
		3 – calling-AE-title-not-recognized	-
		7 – called-AE-title-not-recognized	-
	2 – DICOM UL service-provider (ACSE related function)	1 – no-reason-given	No associations can be accepted at this time. An association request with the same parameters may succeed at a later time.
		2 – protocol-version-not-supported	The maximum number of simultaneous associations has been reached. An association request with the same parameters may succeed at a later time.
	3 – DICOM UL service-provider (presentation related function)	1 – temporary-congestion	-
		2 – local-limit-exceeded	-

4.2.1.4.1 Export

4.2.1.4.1.1 Description and Sequencing of Activities

After requesting storage commitment the BV Family AE will accept an association for the storage commitment report.

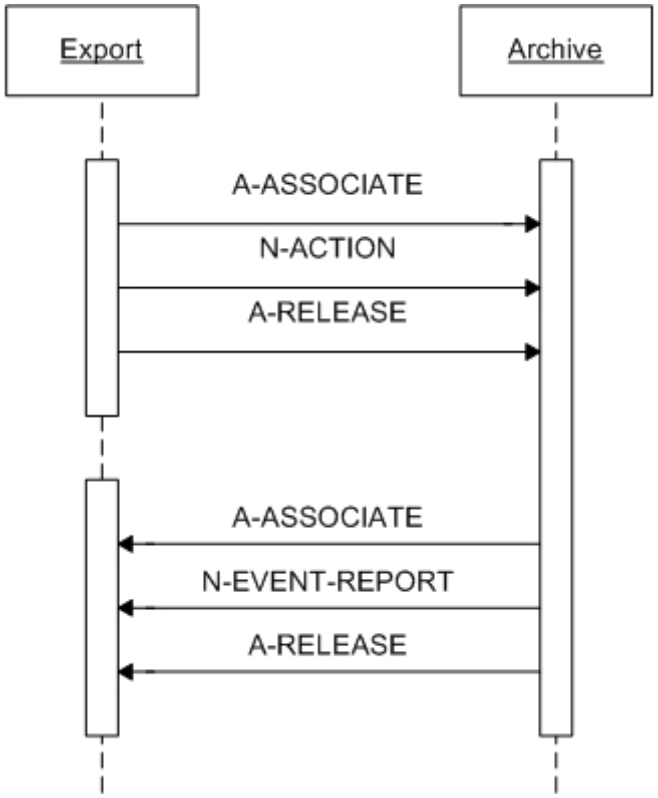

Figure 8: Sequencing of RWA Export

4.2.1.4.1.2 Accepted Presentation Contexts

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

Table 38: Acceptable Presentation Contexts for Export.

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

The 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 SOP Classes

4.2.1.4.1.3.1 Storage Commitment Push Model

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

Table 39: Storage Commitment - 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 status response behavior of the BV Family AE is as summarized in Table 40.

Table 40: Storage Commitment - N-EVENT-REPORT Status Response

Service Status	Code	Further Meaning	Description
Success	0000	Success	The BV Family AE 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.

4.2.2 VF Surgical Workstation AE

4.2.2.1 SOP Classes

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

Table 41: SOP Classes for VF Surgical Workstation AE

SOP Class Name	SOP Class UID	SCU	SCP
STORAGE			
Verification	1.2.840.10008.1.1	No	Yes
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	No	Yes
Digital X-Ray Image Storage – for Presentation	1.2.840.10008.5.1.4.1.1.1.1	No	Yes
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	No	Yes
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	No	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	No	Yes
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	No	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	No	Yes
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	No	Yes
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	No	Yes
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	No	Yes
Specialized X-Ray	1.3.46.670589.2.3.1.1	No	Yes
CX Image	1.3.46.670589.2.4.1.1	No	Yes
3D Volume Storage	1.3.46.670589.5.0.1.1	No	Yes
3D Volume Object Storage	1.3.46.670589.5.0.2.1	No	Yes
Surface Storage	1.3.46.670589.5.0.3.1	No	Yes
MR Cardio Storage	1.3.46.670589.5.0.8.1	No	Yes
CT Synthetic Image	1.3.46.670589.5.0.9	No	Yes
MR Synthetic Image	1.3.46.670589.5.0.10	No	Yes
MR Cardio Analysis Storage	1.3.46.670589.5.0.11.1	No	Yes
CX Synthetic Image	1.3.46.670589.5.0.12	No	Yes
Perfusion	1.3.46.670589.5.0.13	No	Yes

SOP Class Name	SOP Class UID	SCU	SCP
Perfusion Analysis	1.3.46.670589.5.0.14	No	Yes
QUERY / RETRIEVE			
Patient Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	Yes	No
Patient Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.1.2	Yes	No
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	No
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	No
Patient/Study Only Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.3.1	Yes	No
Patient/Study Only Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.3.2	Yes	No

4.2.2.2 Association Policies

4.2.2.2.1 General

The DICOM standard application context shall be specified.

Table 42: DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1

4.2.2.2.2 Number of Associations

The VF Surgical Workstation AE may initiate and accept one association simultaneously.

Table 43: Number of Associations as an Association Initiator VF Surgical Workstation AE

Maximum number of simultaneous associations	3

Table 44: Number of Associations as an Association Acceptor for VF Surgical Workstation AE

Maximum number of simultaneous associations	configurable

4.2.2.2.3 Asynchronous Nature

The VF Surgical Workstation AE does not support asynchronous operations and will not perform asynchronous window negotiation.

4.2.2.2.4 Implementation Identifying Information

For identification of the VF Surgical Workstation AE the following Implementation Class UID and Implementation Version Name are supplied.

Table 45: DICOM Implementation Class UID / Version Name

Implementation Class UID	1.3.46.670589.5.2.23
Implementation Version Name	ViewForum R4.2

4.2.2.2.5 Communication Failure Handling

The behavior of the AE during communication failure is summarized in Table 46.

Table 46: Communication Failure Behavior

Exception	Behavior
ARTIM Timeout	The job fails in case of association setup. The reason is logged and reported to the operator.
Reply Timeout	The job fails and the association is aborted. The reason is logged and reported to the operator.
Association Timeout	The association is released.
Association Aborted	The job fails. The reason is logged and reported to the operator.

4.2.2.3 Association Initiation Policy

This describes the conditions under which the AE will initiate an association.

4.2.2.3.1 Query/Retrieve Image

4.2.2.3.1.1 Description and Sequencing of Activities

For viewing images, the operator can use the VF Surgical Workstation AE to query a remote archive and select the images to retrieve. The VF Surgical Workstation AE then sends a retrieve request and accepts the related images.

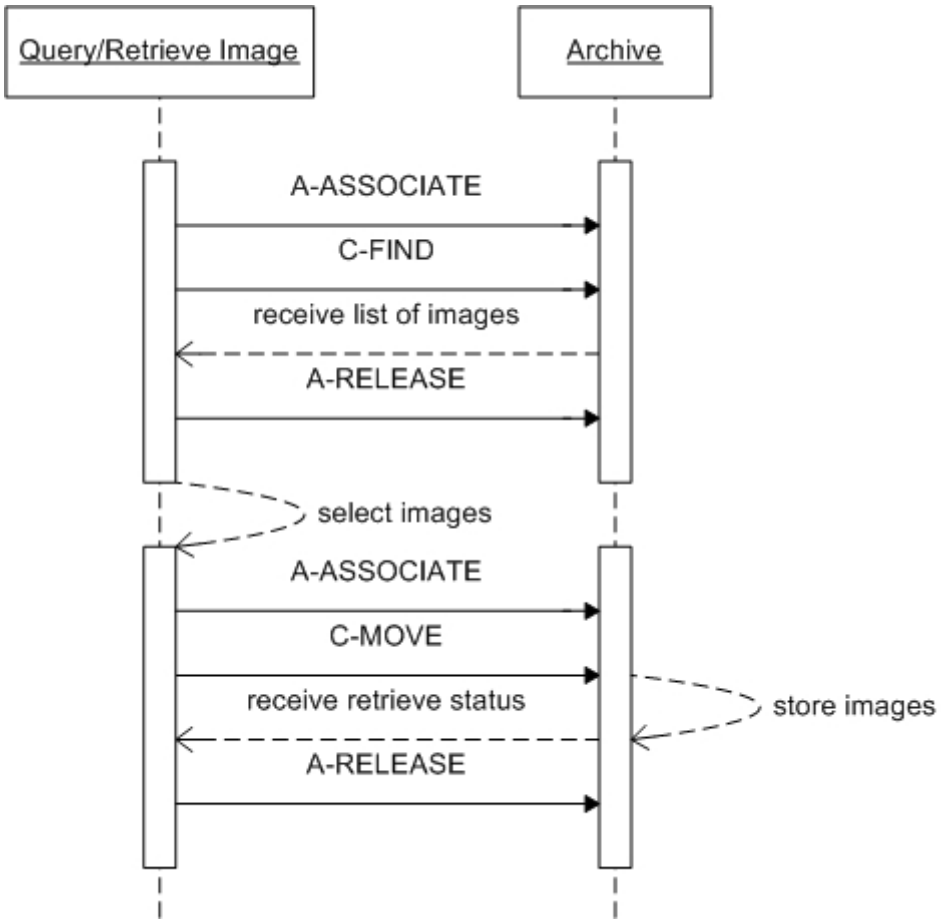

Figure 9: Sequencing of RWA Query/Retrieve Image

The operator queries a remote archive, using the query tool in the data handling facility. The VF Surgical Workstation AE initiates an association to the selected peer entity (Archive) and uses it to send Query (C-FIND) requests and receive subsequent responses. The association is released when the execution of the query completes and the Query/Retrieve dialog on the GUI is closed. The matching images are then displayed in a patient folder for the remote archive.
The required images can now be selected for copying to the BV Family, using the copy tool in the data handling facility. For each copy request the VF Surgical Workstation AE initiates an association to the selected peer entity (Archive) and uses it to send Retrieve (C-MOVE) requests and receive subsequent responses; an examination may contain both images and presentation states. The association is released after the final Retrieve (C-MOVE) response for the related request has been received (no more pending).

4.2.2.3.1.2 Proposed Presentation Contexts

For Query/Retrieve Image the VF Surgical Workstation AE will propose the following presentation contexts.

Table 47: Proposed Presentation Contexts for Query/Retrieve Image

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	ELE EBE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	ELE EBE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
Patient/Study Only Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.3.1	ELE EBE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
Patient Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.1.2	ELE EBE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	ELE EBE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
Patient/Study Only Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.3.2	ELE EBE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
Any other defined SOP class		ELE EBE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None

Note: For performance reasons the ELE transfer syntax is preferred.

4.2.2.3.1.3 SOP Specific Conformance for SOP Classes

This section includes the SOP specific behavior, i.e. error codes, error and exception handling, time-outs, etc. The information shall be as described in the SOP specific Conformance Statement section of [DICOM] PS 3.4 (or relevant private SOP definition). It shall include the content of any extended negotiation. Keys shall be specified including how they are used (Matching, Return keys, interactive query, whether they are displayed to the user, Universal and / or list matching, etc.).

4.2.2.3.1.3.1 Query/Retrieve Information Model – FIND

The VF Surgical Workstation AE will not generate queries containing optional keys. The VF Surgical Workstation AE will not generate relational queries.

In the following table the supported query keys for each query level are described. Universal matching shall be supported as default.

Table 48: Supported Query Keys

Query Level	Query Key		Type of Matching
	Name	Tag	
Patient	Patient's Name	0010,0010	Wild Card / Universal
	Patient ID	0010,0020	Wild Card / Universal
	Patient's Birth Date	0010,0030	-
	Patient's Sex	0010,0040	-
Study	Study Date	0008,0020	-
	Study Time	0008,0030	-
	Accession Number	0008,0050	-
	Modalities in Study	0008,0061	-
	Referring Physician's Name	0008,0090	-
	Study Description	0008,1030	-
	Study Instance UID	0020,000D	-
	Study ID	0020,0010	-
Series	Modality	0008,0060	-
	Station Name	0008,1010	-
	Performing Physician's Name	0008,1050	-
	Body Part Examined	0018,0015	-
	Protocol Name	0018,1030	-
	Series Instance UID	0020,000E	-
	Series Number	0020,0011	-
	Performed Procedure Step Start Date	0040,0244	-
	Performed Procedure Step ID	0040,0253	-
Image	SOP Class UID	0008,0016	-
	SOP Instance UID	0008,0018	-
	Content Date	0008,0023	-
	Content Time	0008,0033	-
	Instance Number	0020,0013	-

Do note that the query results screen will display all patients that have an empty Patient ID as one patient entry.

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 49.

Table 49: C-FIND Command Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Success	0000	Matching is complete	The find results are displayed.
Failure	A700	Refused – Out of resources	No find results are displayed. The reason is logged.
	A900	Failed – Identifier does not match SOP class	No find results are displayed. The reason is logged.
	Cxxx	Failed – Unable to process	No find results are displayed. The reason is logged.
Cancel	FE00	Matching terminated due to Cancel Request	No find results are displayed. The reason is logged.
Pending	FF00	Matches are continuing – Current match is supplied and any optional keys were supported in the same manner as required keys	The find command continues.
	FF01	Matches are continuing – Warning that one or more optional keys were not supported for existence and/or matching for this identifier	The find command continues.

4.2.2.3.1.3.2 Query/Retrieve Information Model – MOVE

The VF Surgical Workstation AE provides standard conformance.

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

Table 50: C-MOVE Command Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Success	0000	Sub-operations complete – No Failures	The move job is marked as completed. The association is released.
Failure	A701	Refused – Out of Resources – Unable to calculate number of matches	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
	A702	Refused – Out of Resources – Unable to perform Sub-operations	The move job is marked as failed. The association is released. The reason is logged and reported to the user.

Service Status	Code	Further Meaning	Behavior
	A801	Refused – Move Destination unknown	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
	A900	Failed – Identifier does not match SOP class	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
	Cxxx	Failed – Unable to process	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
Cancel	FE00	Sub-operations terminated due to Cancel Indication	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
Warning	B000	Sub-operations complete – One or more Failures	The move job is marked as completed. The association is released.
Pending	FF00	Sub-operations are continuing	The move job continues.

4.2.2.4 Association Acceptance Policy

4.2.2.4.1 Query/Retrieve Image

4.2.2.4.1.1 Description and Sequencing of Activities

For viewing images, the VF Surgical Workstation AE accepts the retrieved images.

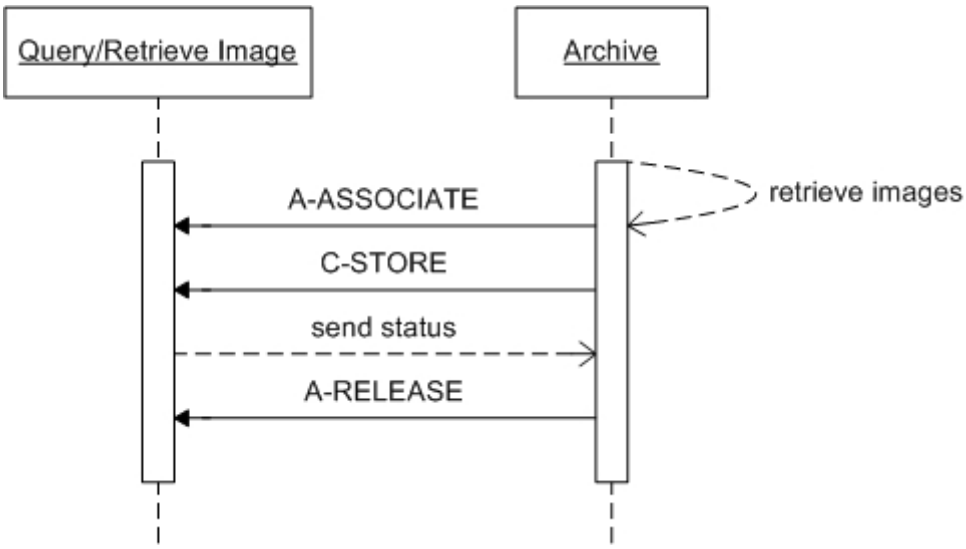

Figure 10: Sequencing of RWA Query/Retrieve Image

For each retrieve request (selected from query results) the VF Surgical Workstation AE accepts an association from the selected peer entity (Archive) and uses it to receive image Storage (C-STORE) requests and send subsequent responses. On request of the Storage SCU (Archive) the association is released.

4.2.2.4.1.2 Accepted Presentation Contexts

The VF Surgical Workstation AE will accept Presentation Contexts as shown in Table 51.

Table 51: Acceptable Presentation Contexts for Query/Retrieve Image

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Any defined SOP class		ELE	1.2.840.10008.1.2.1	SCP	None
		EBE	1.2.840.10008.1.2.2		
		ILE	1.2.840.10008.1.2		

Note: For performance reasons the ELE transfer syntax is preferred and shall be chosen in case multiple transfer syntaxes are proposed in the association negotiation.

The VF Surgical Workstation AE shall accept aal contexts in the intersection of the proposed and acceptable presentation contexts. This means that the VF Surgical Workstation AE accepts multiple proposed presentation contexts with the same SOP class but different transfer syntaxes.
There is no check for duplicate contexts, and these will therefore be accepted.

4.2.2.4.1.3 SOP Specific Conformance for SOP Classes

4.2.2.4.1.3.1 Verification

The VF Surgical Workstation AE provides standard conformance to the Verification service class.

The behavior of an Application Entity SOP class shall be summarized as shown in Table 52. The standard as well as the manufacturer specific status codes and their corresponding behavior shall be specified.

Table 52: C-ECHO Status Response

Service Status	Code	Further Meaning	Description
Success	0000	Confirmation	Standard verification response.

4.2.2.4.1.3.2 Image Storage

The VF Surgical Workstation AE provides standard level 1 (Base) conformance to the Storage service class.

If the VF Surgical Workstation AE imports an image and during the association negotiation the Presentation State SOP Class was not negotiated, then the VF Surgical Workstation AE creates a Presentation State instance for the imported image.

The VF Surgical Workstation AE standard supports the Photometric Interpretation MONOCHROME1, MONOCHROME2, and RGB.

The behavior of an Application Entity SOP class shall be summarized as shown in Table 53. The standard as well as the manufacturer specific status codes and their corresponding behavior shall be specified.

Table 53: C-STORE Status Response

Service Status	Code	Further Meaning	Description
Success	0000	Storage is complete	The images are stored in the VF Surgical Workstation AE database.
Failure	A700	Refused – Out of resources	The VF Surgical Workstation AE database is full – recovery from this condition is left to the SCU. The VF Surgical Workstation AE sends a notification, log the condition, and abort the association.
	A900	Error – Data set does not match SOP class	The SOP class of the image(s) does not match the negotiated abstract syntax. The VF Surgical Workstation AE sends a notification, log the condition, and abort the association.
	C000	Error – Cannot understand	The image(s) cannot be parsed. The VF Surgical Workstation AE sends a notification, log the condition, and abort the association.
Warning	B000	Coercion of data elements	N/A
	B006	Elements discarded	N/A
	B007	Data set does not match SOP class	N/A

4.3 Network Interfaces

4.3.1 Physical Network Interface

The BV Family provides DICOM 3.0 TCP/IP Network Communication Support as defined in [DICOM] PS 3.8.
For the BV Family AE the TCP/IP stack is inherited from the VxWorks Operating System.
For the VF Surgical Workstation AE the TCP/IP stack is inherited from the Windows XP Operating System.

The BV Family supports Ethernet (ISO 8802-3) and IEEE 802.3 (10 / 100 BASE-T), for the Image and Printer Interface.

4.3.2 Additional Protocols

No additional protocols are used.

4.4 Configuration

The configuration of a BV Family AE is done by means of a web-based service program, called BV-Scope.
The configuration of a VF Surgical Workstation AE is done by means of a configuration program, which is accessible at start-up (password protected, intended to be used by Philips Customer Support Engineers only).

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 54: AE Title Configuration Table

Application Entity	Default AE Title	Default (fixed) TCP/IP port
BV Family AE	“No Name”	104
		8104 (StorageCommitment)
VF Surgical Workstation AE	“VF1”	3010

Note: these TCP/IP port addresses are not configurable.

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 the BV Family.

- The Application Entity Title.
- The IP host name / IP address on which the remote application resides.
- The port number at which the remote application has to send association requests.
- The SOP classes and transfer syntaxes for which the VF Surgical Workstation AE accepts associations.

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 of the BV Family AE are given in Table 55, categorized in the following sections:

- Local System Parameters
- Export Target (Store) Parameters
- Export Target (Print) Parameters
- Worklist Management Target Parameters
- MPPS Target Parameters

Table 55: Configuration Parameters table for BV Family AE

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
Max. PDU size		Yes	Range: 4 .. 256 kBytes. Default: 28672 Bytes
Receive Message Timeout		Yes	Range: 0 .. 3600 Seconds. Default: 60 [s]
Association Close Timeout		Yes	Range: 0 .. 3600 Seconds. Default: 1 [s]
Association Reply Timeout		Yes	Range: 0 .. 3600 Seconds. Default: 60 [s]
Association Release Timeout		Yes	Range: 0 .. 3600 Seconds. Default: 60 [s]
Network Write Timeout		Yes	Range: 0 .. 3600 Seconds. Default: 60 [s]
Network Connect Timeout		Yes	Range: 0 .. 3600 Seconds. Default: 60 [s]
Network Inactivity - Timeout		Yes	Range: 0 .. 3600 Seconds. Default: 60 [s]
Storage Commitment (N-EVENT-REPORT) Parameters			
AE Title		AE Title	Local System AE Title
IP Address		IP Address	Local System IP Address
Port number		Port number	Fixed: 8104
Export Target(s) (Storage) Parameters			
AE Title		Yes	"No Name"
Name		Yes	Max. 25 Char. Unique
IP Address		Yes	0.0.0.0
Port number		Yes	104
Type		Yes	STORE
Storage Commit	AE Title	Yes	"No Name"
	IP Address	Yes	0.0.0.0
	Port number	Yes	104
	Enable / Disable	Yes	Disable
Export Target(s) (Print) Parameters			
AE Title		Yes	"No Name"
Name		Yes	Max. 25 char. Unique
IP Address		Yes	0.0.0.0
Port number		Yes	104
Type		Yes	PRINT
Printer type		Yes	Predefined List
Printer Priority		Yes	Low
Film Destination		Yes	Current
Film Orientation		Yes	PORTRAIT
Film Size		Yes	Current, 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 Parameters			
AE Title		Yes	"No Name"

Parameter	Configurable	Default Value, Comment
Name	Yes	Max. 25 Char. Unique
IP Address	Yes	0.0.0.0
Port number	Yes	104
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 Parameters		
AE Title	Yes	“No Name”
Name	Yes	Max. 25 Char. Unique
IP Address	Yes	0.0.0.0
Port number	Yes	104
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

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

Table 56: Configuration Parameters table for VF Surgical Workstation AE

Parameter	Configurable	Default Value
General Parameters		
Time-out waiting for acceptance or rejection Response to an Association Open Request. (Application Level timeout)	No	-
General DIMSE level time-out values	No	-
Time-out waiting for response to TCP/IP connect request. (Low-level timeout)	No	-
Time-out waiting for acceptance of a TCP/IP message over the network. (Low-level timeout)	No	-
Time-out for waiting for data between TCP/IP packets. (Low-level timeout)	No	-
Any changes to default TCP/IP settings, such as configurable stack parameters.	No	-
Local Configurable AE Specific Parameters		
Size constraint in maximum object size	No	-
Maximum PDU size the AE can receive	Yes	0 (unlimited)
Maximum PDU size the AE can send	No	-
AE specific DIMSE level time-out values	No	-
Number of simultaneous Associations by Service and/or SOP Class	No	-
SOP Class support	Yes	none
Transfer Syntax support	Yes	ELE
Remote Configurable AE Specific Parameters		
Size constraint in maximum object size	No	-
Maximum PDU size the AE can receive	Yes	0 (unlimited)
Maximum PDU size the AE can send	No	-
AE specific DIMSE level time-out values	No	-
Number of simultaneous Associations by Service and/or SOP Class	No	-
<SOP Class support (e.g. Multi-frame vs single frame vs SC support), when configurable>	Yes	none
<Transfer Syntax support, e.g. JPEG, Explicit VR, when configurable>	Yes	ELE

5 MEDIA INTERCHANGE

5.1 Implementation Model

5.1.1 Application Data Flow Diagram

The media interchange implementation of the BV Family is implemented in the VF Surgical Workstation AE. Figure 11 shows the Media Interchange Application Data Flow as a functional overview of the VF Surgical Workstation AE for DVD.

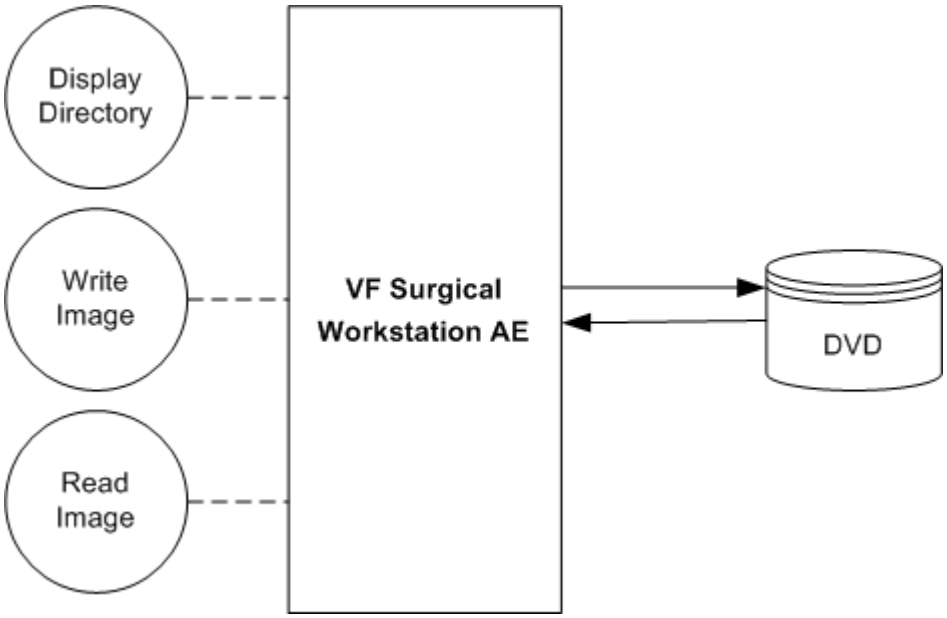

Figure 11: Application Data Flow Diagram

Table 61 shows the Media Interchange overview of the VF Surgical Workstation AE and the supporting roles for DVD.

Table 57: Media Services table

Media Storage Application	Write Files		Read Files (FSR)
	(FSC)	(FSU)	
General Purpose DVD-JPEG	YES	NO	YES

The VF Surgical Workstation AE will act as a FSR for DVD, when reading the directory of the medium. The VF Surgical Workstation AE will act as a FSC for a DVD, when writing the selected images in a patient folder onto the medium.
VF Surgical Workstation AE supports the media profiles as shows in the Table below:

Table 58: Media Profiles supported by VF Surgical Workstation AE

Application Profile	DVD + R / DVD + RW
General Purpose	STD-GEN-DVD

Note; DVD - R and DVD - RW are not supported for writing.

The system proposes the transfer syntaxes mentioned in Table below.

Table 59: Transfer Syntaxes of DVD supported by VF Surgical Workstation AE

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List (note)	UID List		
See Note	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 image storage and private SOP classes mentioned before. The preferred transfer syntax is ELE.

5.1.2 Functional Definitions of AE's

The VF Surgical Workstation AE implements the following functions for DICOM media.

- Write a DICOM file-set onto media;
- Create a DICOMDIR on media;
- Read the DICOMDIR from media;
- Read selected images from media;

5.1.3 Sequencing of Real World Activities

Whenever DICOM media (DVD) has to be written, the VF Surgical Workstation AE first tries to read the DICOMDIR. The VF Surgical Workstation AE will compile the updated DICOMDIR and any required DICOM images into a DVD session image; this session image will be written to the DICOM media.

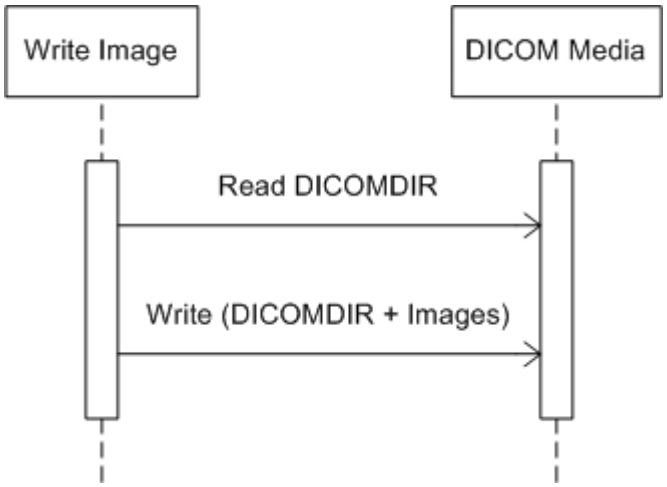

Figure 12: Sequencing of RWA Write Image

After the data is written to the DICOM media, the DICOM media needs to make compatible (finalized) by the user so that the media is readable with common used DVD readers.

5.1.4 File Meta Information for Implementation Class and Version

The Implementation Class UID and Implementation Version Name are supplied as specified for the VF Surgical Workstation AE for networking.
Conform [DICOM], using File Meta Information Header version 1 requires the File Meta Information Version to be set as specified below.

Table 60: File Meta Information for VF Surgical Workstation AE

File Meta Information Version	00, 01
Implementation Class UID	1.3.46.670589.5.2.23
Implementation Version Name	ViewForum R4.2

5.2 AE Specifications

5.2.1 VF Surgical Workstation AE

The VF Surgical Workstation AE provides standard conformance to the DICOM interchange option of the Media Storage service class, and follows the specifications as defined in [DICOM] Media Storage and File Format for Data Interchange (PS 3.10) and Media Storage Application Profiles (PS 3.11).

The VF Surgical Workstation AE supports multi-patient and multi-session for DVD, both for reading and writing. Table 61 shows for each Application Profile in the first column the Real-World Activities in the second column, the roles required for each of these Real-World Activities in the third column, and the related Service Class Option in the fourth column.

Table 61: AE Related Application Profiles, Real-World Activities, and Roles

Supported Application Profile	Real-World Activity	Roles	SC Option
STD-GEN-DVD-JPEG	Display Directory	FSR	Interchange
	Read Image	FSR	Interchange
	Write Image	FSC	Interchange

Note: The Media FSU Role is not supported

5.2.1.1 File Meta Information for the VF Surgical Workstation AE

The Source Application Entity Title is configurable (ref. section 5.4).

5.2.1.2 Real-World Activities

5.2.1.2.1 Display Directory

When a Database Open action is initiated on DICOM media then the VF Surgical Workstation AE acts as an FSR using the interchange option to read the DICOMDIR of the DICOM media.
This will result in an overview of the patients, studies, series, and images on the GUI.

5.2.1.2.1.1 Media Storage Application Profile

As depicted in Table 61, the VF Surgical Workstation AE supports the RWA Display Directory for STD-GEN-DVD-JPEG application profiles.

5.2.1.2.1.1.1 Options

The mandatory DICOMDIR keys are required for the correct display of directory information. The display is structured according the DICOM Composite Information Model: Patient, Study, Series, and Image.

5.2.1.2.2 Read Image

When an image transfer from DICOM media is initiated then the VF Surgical Workstation AE acts as an FSR using the interchange option to import SOP instances from the DICOM media.

5.2.1.2.2.1 Media Storage Application Profile

As depicted in Table 61, the VF Surgical Workstation AE supports the RWA Read Image for STD-GEN-DVD-JPEG application profiles.

5.2.1.2.2.1.1 Options

The mandatory attributes of the DICOM images are required for the correct storage of the images in the local database. Optional attributes and retired/private attributes are stored too – if present; this is equivalent with the level 2 (Full) conformance for the Storage service class in the Network support.

5.2.1.2.3 Write Image

When an image transfer to DICOM media is initiated then the VF Surgical Workstation AE acts as an FSC using the interchange option to write SOP instances on the DICOM media.

5.2.1.2.3.1 Media Storage Application Profile

As depicted in Table 61, the VF Surgical Workstation AE supports the RWA Write Image for STD-GEN-DVD-JPEG application profiles.

5.2.1.2.3.1.1 Options

The DICOMDIR file will be extended when new images are written. In case some attributes are not present in an image but are specified as mandatory in the DICOMDIR definition of DICOM media, a generated value will be filled in.

Implementation remarks an restrictions
When writing the DICOMDIR records, key values are generated when no value of the corresponding attribute is supplied, according to the following table.

Table 62: Generated Keys

Key	Tag	Generated Value
Patient Keys		
Patient ID	0010,0020	At import the VF Surgical Workstation AE each time creates a new value based on the Study Instance UID for each new study written to DICOM media (even if this study belongs to a patient recorded earlier). Otherwise the default generated value shall be a succession of “UNKNOWN”, the Patient’s Name, the Patient’s Birth Date, and the Patient’s Sex, concatenated by using underscore characters.
Study Keys		
Study Date	0008,0020	Current date.
Study Time	0008,0030	Current time.
Study ID	0020,0010	“UNKNOWN”
Series Keys		
Series Number	0020,0011	1
Image Keys		
Instance Number	0020,0013	1

The default value for (0028,1040) Pixel Intensity Relationship is set to DISP.

The VF Surgical Workstation AE can write volumes of the media to that media.
If spanning is required then the VF Surgical Workstation AE asks for a new media.

5.3 Augmented and Private Application Profiles

Not applicable.

5.4 Media Configuration

Any configuration issues may be found in the Networking section 4.4.

6 SUPPORT OF CHARACTER SETS

Following table lists the supported character sets of the BV Family.

Table 63: Supported DICOM Character Sets of the BV Family

Character Set Description	Defined Term	ESC Sequence	ISO Registration Number	Code Element	Character Set
Single-byte Character Sets without Code Extensions					
Default repertoire	-	-	ISO-IR 6	G0	ISO 646
Latin alphabet No. 1	ISO_IR 100	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 100	G1	Supplementary set of ISO 8859
Single-byte Character Sets with Code Extensions					
Default repertoire	ISO 2022 IR 6	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
Latin alphabet No. 1	ISO 2022 IR 100	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/01	ISO-IR 100	G1	Supplementary set of ISO 8859

7 SECURITY

7.1 Security Profiles

7.1.1 Attribute Confidentiality Profiles

7.1.1.1 The Basic Application Level Confidentiality Profile

BV Family AE conforms to the Basic Application Level Confidentiality Profile as de-identifier.

De-identified SOP Instances will be created on DICOM Media if specified by the user.

No instances of the Encrypted Attributes Data Set are created. No Transfer Syntaxes are supported for encoding/decoding of Encrypted Attributes Data Sets.

The terms used to describe the replacement value in the anonymized patient data can be read as follows:

Terms used to describe the replacement value	
COPY	Same value as in source data
EMPTY	The attribute will have a value of zero length.
ANP	Attribute Not Present
n.a.	Not applicable, the attribute is not contained in the standard IOD of the BV Family AE

The next Table lists the protected data attributes.

Table 64: Basic Application Level Confidentiality Profile Attributes

Attribute Name	Tag	VR	Replacement Value
Instance Creator UID	0008,0014	UI	n.a.
SOP Instance UID	0008,0018	UI	COPY
Accession Number	0008,0050	SH	EMPTY
Institution Name	0008,0080	LO	ANP
Institution Address	0008,0081	ST	n.a.
Referring Physician's Name	0008,0090	PN	EMPTY
Referring Physician's Address	0008,0092	ST	n.a.
Referring Physician's Telephone Numbers	0008,0094	SH	n.a.
Station Name	0008,1010	SH	COPY
Study Description	0008,1030	LO	COPY
Series Description	0008,103E	LO	COPY
Institutional Department Name	0008,1040	LO	n.a.
Physician(s) of Record	0008,1048	PN	n.a.
Performing Physicians' Name	0008,1050	PN	ANP
Name of Physician(s) Reading Study	0008,1060	PN	n.a.
Operators' Name (Technologist)	0008,1070	PN	COPY
Admitting Diagnoses Description	0008,1080	LO	n.a.
Referenced SOP Instance UID	0008,1155	UI	COPY
Derivation Description	0008,2111	ST	COPY
Patient's Name	0010,0010	PN	EMPTY
Patient ID	0010,0020	LO	EMPTY

Attribute Name	Tag	VR	Replacement Value
Patient's Birth Date	0010,0030	DA	EMPTY
Patient's Birth Time	0010,0032	TM	COPY
Patient's Sex	0010,0040	CS	EMPTY
Other Patient Ids	0010,1000	LO	COPY
Other Patient Names	0010,1001	PN	COPY
Patient's Age	0010,1010	AS	EMPTY
Patient's Size	0010,1020	DS	COPY
Patient's Weight	0010,1030	DS	COPY
Medical Record Locator	0010,1090	LO	n.a.
Ethnic Group	0010,2160	SH	n.a.
Occupation	0010,2180	SH	n.a.
Additional Patient's History	0010,21B0	LT	n.a.
Patient Comments	0010,4000	LT	n.a.
Device Serial Number	0018,1000	LO	COPY
Protocol Name	0018,1030	LO	COPY
Study Instance UID	0020,000D	UI	COPY
Series Instance UID	0020,000E	UI	COPY
Study ID	0020,0010	SH	EMPTY
Frame of Reference UID	0020,0052	UI	n.a.
Synchronization Frame of Reference UID	0020,0200	UI	n.a.
Image Comments	0020,4000	LT	COPY
Requested Attributes Sequence	0040,0275	SQ	n.a.
UID	0040,A124	UI	n.a.
Content Sequence	0040,A730	SQ	n.a.
Storage Media File-set UID	0088,0140	UI	n.a.
Referenced Frame of Reference UID	3006,0024	UI	n.a.
Related Frame of Reference UID	3006,00C2	UI	n.a.

7.1.1.1.1 Patient data de-identification (Anonymized)

DICOM media that have been written with the de-identification feature switched on (Anonymized data) will have DICOM-format data.

In case of writing to DVD, de-identification is supported. However, when the de-identification feature is active, also Secondary Capture images are written to the DICOM media (it is possible that they contain burned-in patient information).

8 ANNEXES

8.1 IOD Contents

8.1.1 Created SOP Instances

This section specifies each IOD created by the BV Family AE.

By **SOP Classes** the Presence of Module:

ALWAYS	the module shall always present
CONDITIONAL	the module may be available, depending on source object.

If the module is not used, it will not be added in the SOP Class.

By the module the **Present of Value** and attributes:

ALWAYS	Attribute shall always present with a value
EMPTY	Attribute is sent without a value (attribute sent zero length if no value is present)
VNAP	Value Not Always Present (attribute sent zero length if no value is present)
ANAP	Attribute Not Always Present – (if present then it will always have a value)
ANAPCV	Attribute Not Always Present Conditional Value– (if attribute present, then with zero length if no value is present)
ANAPEV	Attribute Not Always Present Empty Value – (if present then it will not have any value)

The Column **Source** with abbreviations:

AUTO	the attribute value is generated dynamic automatically
CONFIG	the attribute is a configurable parameter
COPY	the attribute value is copied from the old SOP instance
FIXED	the attribute value will be automatically, not dynamic generated. (hardcoded implementation)
IMPLICIT	the attribute value source is a user-implicit configuration setting.
MPPS	the attribute value is copied for the Modality Performed Procedure Step message.
MWL	the attribute value copied for the Modality Worklist
USER	the attribute value source is explicit user input

8.1.1.1 Secondary Capture Image Storage SOP Class

Table 65: Modules of the Secondary Capture Image Storage SOP Class

Information Entity	Module Name	Usage
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
	Patient Study Module	CONDITIONAL
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
	SC Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	SC Image Module	ALWAYS
	SOP Common Module	ALWAYS

Table 66: Created Secondary Capture Image Storage SOP Class Attributes

Name	Tag	VR	Comment	Presence of Value	Source
Patient Module					
Patient's Name	0010,0010	PN	-	ALWAYS	MWL / USER
Patient ID	0010,0020	LO	-	ALWAYS	MWL / USER
Patient's Birth Date	0010,0030	DA	-	ALWAYS	MWL / USER
Patient's Birth Time	0010,0032	TM	(format <hhmm>)	AWAYS	MWL
Patient's Sex	0010,0040	CS	-	ALWAYS	MWL / USER
Other Patient IDs	0010,1000	LO	-	VNAP	MWL
Other Patient Names	0010,1001	PN	-	VNAP	MWL
General Study Module					
Study Date	0008,0020	DA	Examination date.	ALWAYS	AUTO
Study Time	0008,0030	TM	Examination time (format <hhmm>).	ALWAYS	AUTO
Accession Number	0008,0050	SH	-	ALWAYS	MWL / USER
Referring Physician's Name	0008,0090	PN	-	VNAP	MWL
Study Description	0008,1030	LO	Selected examination type	ALWAYS	USER
Referenced Study Sequence	0008,1110	SQ	-	VNAP	MWL
>Referenced SOP Class UID	0008,1150	UI	-	VNAP	MWL
>Referenced SOP Instance UID	0008,1155	UI	-	ALWAYS	MWL
Study Instance UID	0020,000D	UI	-	ALWAYS	AUTO/ MWL
Study ID	0020,0010	SH	-	EMPTY	AUTO
Patient Study Module					
Patient's Weight	0010,1030	DS	-	VNAP	MWL
General Series Module					

Name	Tag	VR	Comment	Presence of Value	Source
Performing Physician's Name	0008,1050	PN	Copied from scheduled performing physician's name if this provided by MWL or can be entered by Operator.	ALWAYS	MWL/ USER
Series Instance UID	0020,000E	UI	-	ALWAYS	AUTO
Series Number	0020,0011	IS	Increasing number that identifies series (run).	ALWAYS	AUTO
Laterality	0020,0060	CS	-	VNAP	AUTO
Performed Procedure Step Start Date	0040,0244	DA	Examination date.	EMPTY	AUTO
Performed Procedure Step Start Time	0040,0245	TM	Examination time (format <hhmm>).	ALWAYS	AUTO
Performed Procedure Step ID	0040,0253	SH		VNAP	AUTO
Performed Procedure Step Description	0040,0254	LO	Copied from: Study Description	AWAYS	AUTO
General Equipment Module					
Manufacturer	0008,0070	LO	Applied value: Philips Medical Systems	ALWAYS	AUTO
Institution Name	0008,0080	LO	Hospital name	ALWAYS	CONFIG
Station Name	0008,1010	SH	-	ALWAYS	CONFIG
Software Version(s)	0008,1020	LO	PMS1.1 MIMIT EVIIMDictionary	ALWAYS	AUTO
Manufacturer's Model Name	0008,1090	LO	Applied value: BV Family	ALWAYS	AUTO
SC Equipment Module					
Modality	0008,0060	CS	Applied values: OT (Dose report only); XA	ALWAYS	AUTO
Conversion Type	0008,0064	CS	Applied value: DI	ALWAYS	AUTO
Secondary Capture Device ID	0018,1010	LO	BV System ID.	ALWAYS	CONFIG
Secondary Capture Device Manufacturer	0018,1016	LO	Applied value: Philips Medical Systems	ALWAYS	AUTO
Secondary Capture Device Manufacturer's Model Name	0018,1018	LO	Applied value: BV Family	ALWAYS	AUTO
Secondary Capture Device Software Version	0018,1019	LO	Applied value: BV Family R2.1	ALWAYS	AUTO
General Image Module					
Image Type	0008,0008	CS	Applied value: DERIVED\ SECONDARY	ALWAYS	AUTO
Instance Number	0020,0013	IS	Generated running number.	ALWAYS	AUTO
Patient Orientation	0020,0020	CS	-	EMPTY	AUTO
Presentation LUT Shape	2050,0020	CS	IDENTITY	ALWAYS	AUTO
Image Pixel Module					
Samples per Pixel	0028,0002	US	Applied value: 1	ALWAYS	AUTO
Photometric Interpretation	0028,0004	CS	Applied value: MONOCHROME2	ALWAYS	AUTO
Rows	0028,0010	US	Applied values: Always 1024	ALWAYS	AUTO
Columns	0028,0011	US	Applied value: For SC images with Text: 1280, For SC images without Text: 1024	ALWAYS	AUTO

Name	Tag	VR	Comment	Presence of Value	Source
Pixel Aspect Ratio	0028,0034	IS	Not send, (because = 1 / 1)	ANAP	AUTO
Bits Allocated	0028,0100	US	Applied value: 16	ALWAYS	AUTO
Bits Stored	0028,0101	US	Applied value: 12	ALWAYS	AUTO
High Bit	0028,0102	US	Applied value: 11	ALWAYS	AUTO
Pixel Representation	0028,0103	US	Applied value: 0	ALWAYS	AUTO
Pixel Data	7FE0,0010	OW	-	ALWAYS	AUTO
SC Image Module					
Date of Secondary Capture	0018,1012	DA	-	ALWAYS	AUTO
Time of Secondary Capture	0018,1014	TM	(format <hhmm>)	ALWAYS	AUTO
SOP Common Module					
Specific Character Set	0008,0005	CS	Applied value: ISO_IR 100	ALWAYS	AUTO
SOP Class UID	0008,0016	UI	Applied value: 1.2.840 .10008.5.1.4.1.1.7 (SC Image Storage)	ALWAYS	AUTO
SOP Instance UID	0008,0018	UI	-	ALWAYS	AUTO

Note: If a Persons Name, coming from WLM, contains the character code 5CH (the BACKSLASH "\" in ISO-IR 6) the characters behind the character code 5CH will not be present in the GUI and during export.

8.1.1.2 X-Ray Angiographic Image Storage SOP Class

Table 67: Modules of the X-Ray Angiographic Image Storage SOP Class

Information Entity	Module Name	Usage
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
	Patient Study Module	CONDITIONAL
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	Cine Module	ALWAYS
	Multi-Frame Module	ALWAYS
	X-Ray Image Module	ALWAYS
	X-Ray Acquisition Module	ALWAYS
	XA Positioner Module	ALWAYS
	SOP Common Module	ALWAYS

Table 68: Created X-Ray Angiographic Image Storage SOP Attributes

Name	Tag	VR	Definition	Presence of Value	Source
Patient Module					
Patient's Name	0010,0010	PN	-	ALWAYS	MWL / USER
Patient ID	0010,0020	LO	-	ALWAYS	MWL / USER
Patient's Birth Date	0010,0030	DA	-	ALWAYS	MWL / USER
Patient's Birth Time	0010,0032	TM	(format <hhmm>)	ALWAYS	MWL
Patient's Sex	0010,0040	CS	-	ALWAYS	MWL / USER
Other Patient ID's	0010,1000	LO	-	VNAP	MWL
Other Patient Names	0010,1001	PN	-	VNAP	MWL
General Study Module					
Study Date	0008,0020	DA	Examination date.	ALWAYS	AUTO
Study Time	0008,0030	TM	Examination time (format <hhmm>).	ALWAYS	AUTO
Accession Number	0008,0050	SH	-	ALWAYS	MWL/ USER
Referring Physician's Name	0008,0090	PN	-	VNAP	MWL
Study Description	0008,1030	LO	Selected examination type.	ALWAYS	USER
Referenced Study Sequence	0008,1110	SQ	-	VNAP	MWL
>Referenced SOP Class UID	0008,1150	UI	-	ALWAYS	MWL
>Referenced SOP Instance UID	0008,1155	UI	-	ALWAYS	MWL
Study Instance UID	0020,000D	UI	-	ALWAYS	AUTO/ MWL
Study ID	0020,0010	SH	-	EMPTY	AUTO
Patient Study Module					
Patient's Weight	0010,1030	DS	-	VNAP	MWL
General Series Module					
Modality	0008,0060	CS	Applied value: XA	ALWAYS	AUTO
Series Description	0008,103E	LO	User provided description of the series.	ALWAYS	AUTO
Performing Physician's Name	0008,1050	PN	Copied from scheduled performing physician's name if this provided by MWL or can be entered by Operator.	ALWAYS	MWL/ USER
Series Instance UID	0020,000E	UI	-	ALWAYS	AUTO
Series Number	0020,0011	IS	Increasing number that identifies series (run).	ALWAYS	AUTO
Laterality	0020,0060	CS	-	EMPTY	AUTO
Performed Procedure Step Start Date	0040,0244	DA	Examination date.	ALWAYS	AUTO
Performed Procedure Step Start Time	0040,0245	TM	Examination time (format <hhmm>).	ALWAYS	AUTO
Performed Procedure Step ID	0040,0253	SH		VNAP	AUTO
Performed Procedure Step Description	0040,0254	LO	Copied from: Study Description	AWAYS	AUTO
General Equipment Module					
Manufacturer	0008,0070	LO	Applied value: Philips Medical Systems	ALWAYS	AUTO
Institution Name	0008,0080	LO	Hospital name.	ALWAYS	CONFIG
Station Name	0008,1010	SH	-	ALWAYS	CONFIG

Name	Tag	VR	Definition	Presence of Value	Source
Manufacturer's Model Name	0008,1090	LO	Applied value: BV Family	ALWAYS	AUTO
Software Version(s)	0018,1020	LO	PMS1.1 MIMIT EVIIMDictionary	ALWAYS	CONFIG
General Image Module					
Content Date	0008,0023	DA	-	ALWAYS	AUTO
Content Time	0008,0033	TM	(format <hhmm>)	ALWAYS	AUTO
Instance Number	0020,0013	IS	-	ALWAYS	AUTO
Patient Orientation	0020,0020	CS	-	EMPTY	AUTO
Image Pixel Module					
Rows	0028,0010	US	Applied value: 1024	ALWAYS	AUTO
Columns	0028,0011	US	Applied value: 1024	ALWAYS	AUTO
Pixel Aspect Ratio	0028,0034	IS	Not send, (because = 1 / 1)	ANAP	AUTO
Pixel Data	7FE0,0010	OW	-	ALWAYS	AUTO
Cine Module					
Start Trim	0008,2142	IS	Applied value: 1	ALWAYS	AUTO
Stop Trim	0008,2143	IS	Number of images in the run.	ALWAYS	AUTO
Recommended Display Frame Rate	0008,2144	IS	Acquisition speed.	ALWAYS	AUTO
Cine Rate	0018,0040	IS	Calculated from acquisition speed.	ALWAYS	AUTO
Frame Time	0018,1063	DS	Calculated from acquisition speed [ms].	ALWAYS	AUTO
Multi-Frame Module					
Number of Frames	0028,0008	IS	Number of exported images in the run.	ALWAYS	AUTO
Frame Increment Pointer	0028,0009	AT	Applied value: 0x00181063 (Frame Time)	ALWAYS	AUTO
X-Ray Image Module					
Image Type	0008,0008	CS	Applied value: ORIGINAL\PRIMARY	ALWAYS	AUTO
Samples per Pixel	0028,0002	US	Applied value: 1	ALWAYS	AUTO
Photometric Interpretation	0028,0004	CS	Applied value: MONOCHROME2	ALWAYS	AUTO
Bits Allocated	0028,0100	US	Applied value: 16	ALWAYS	AUTO
Bits Stored	0028,0101	US	Applied value: 12	ALWAYS	AUTO
High Bit	0028,0102	US	Applied value: 11	ALWAYS	AUTO
Pixel Representation	0028,0103	US	Applied value: 0	ALWAYS	AUTO
Pixel Intensity Relationship	0028,1040	CS	Applied value: LIN	ALWAYS	AUTO
X-Ray Acquisition Module					
KVP	0018,0060	DS	-	EMPTY	AUTO
Field of View Shape	0018,1147	CS	Applied value: ROUND	ALWAYS	AUTO
Exposure	0018,1152	IS	-	EMPTY	AUTO
Radiation Setting	0018,1155	CS	Applied values: GR, SC	ALWAYS	AUTO
Type of Filters	0018,1161	LO	Applied value: NONE	ALWAYS	AUTO
Intensifier Size	0018,1162	DS	Applied values: 150, 230, 310	ALWAYS	AUTO
Grid	0018,1166	CS	Applied value: IN	ALWAYS	AUTO
XA Positioner Module					
Distance Source to Detector	0018,1110	DS	Applied value: 995	ALWAYS	AUTO
Positioner Motion	0018,1500	CS	-	EMPTY	AUTO
Positioner Primary Angle	0018,1510	DS	Applied value: 0.0	ALWAYS	AUTO

Name	Tag	VR	Definition	Presence of Value	Source
Positioner Secondary Angle	0018,1511	DS	Applied value: 0.0	ALWAYS	AUTO
SOP Common Module					
Specific Character Set	0008,0005	CS	Applied value: ISO_IR 100	ALWAYS	AUTO
SOP Class UID	0008,0016	UI	Uniquely identifies the SOP Class. Applied value: 1.2.840.10008.5.1.4.1.1.12.1 (X-Ray Angiography Image Storage)	ALWAYS	AUTO
SOP Instance UID	0008,0018	UI	-	ALWAYS	AUTO

8.1.1.3 Grayscale Softcopy Presentation State Storage SOP Class

When the BV Family imports a storage object, from Modality, Pacs or Workstation, without presentation state object then it will create a presentation object for this storage object, which it then can use for export (if negotiated).
If private presentation state information exists, then this will be used to create the presentation state object. Depending on the setup, the BV Family may or may not add this private presentation state information on export to DVD.

Table 69: Modules of the Grayscale Softcopy Presentation State Storage SOP Class

Information Entity	Module Name	Reference	Presence of Module
Patient	Patient Module		ALWAYS
Study	General Study Module		ALWAYS
Series	General Series Module		ALWAYS
	Presentation Series Module		ALWAYS
Equipment	General Equipment Module		ALWAYS
Image	Graphic Layer Module		CONDITIONAL
	Displayed Area Module		ALWAYS
	Graphic Annotation		CONDITIONAL
	Softcopy Presentation LUT Module		ALWAYS
	Softcopy VOI LUT Module		CONDITIONAL
	Presentation State Module		ALWAYS
	SOP Common Module		ALWAYS

Table 70: Grayscale Softcopy Presentation State Storage SOP Class - Patient Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	0010,0010	PN		ALWAYS	SPEC
Patient ID	0010,0020	LO		VNAP	SPEC
Patient's Birth Date	0010,0030	DA		VNAP	SPEC
Patient's Sex	0010,0040	CS	Applied Value(s): F, M, O	VNAP	SPEC

Table 71: Grayscale Softcopy Presentation State Storage SOP Class - General Study Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Date	0008,0020	DA	Date on which this Study was created.	ALWAYS	SPEC
Study Time	0008,0030	TM	Time on which this Study was created.	ALWAYS	SPEC
Accession Number	0008,0050	SH		VNAP	SPEC
Referring Physician's Name	0008,0090	PN		VNAP	SPEC
Study Description	0008,1030	LO		VNAP	SPEC
Referenced Study Sequence	0008,1110	SQ	UNDEFINED	ANAP	AUTO
> Referenced SOP Class UID	0008,1150	UI	1.2.840.10008.3.1.2.3.3	ALWAYS	AUTO
> Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO
Study Instance UID	0020,000D	UI		ALWAYS	SPEC
Study ID	0020,0010	SH		VNAP	SPEC

Table 72: Grayscale Softcopy Presentation State Storage SOP Class - General Series Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Series Date	0008,0021	DA	Date the Series started	ANAP	AUTO
Series Time	0008,0031	TM	Time the Series started	ANAP	AUTO
Performing Physician's Name	0008,1050	PN		VNAP	USER
Operators' Name	0008,1070	PN		VNAP	USER
Referenced Performed Procedure Step_Sequence	0008,1111	SQ	UNDEFINED	ANAP	AUTO
>Referenced SOP Class UID	0008,1150	UI	1.2.840.10008.3.1.2.3.3	ALWAYS	AUTO
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO
Protocol Name	0018,1030	LO		ANAP	SPEC
Series Number	0020,0011	IS		VNAP	SPEC
Series Instance UID	0020,000E	UI		ALWAYS	AUTO
Laterally	0020,0060	CS	Applied Value(s): L, R	MAYBE	SPEC
Performed Procedure Step Start Date	0040,0244	DT		ALWAYS	SPEC
Performed Procedure Step Start Time	0040,0245	TM		ALWAYS	SPEC
Performed Procedure Step ID	0040,0253	SH		ANAP	AUTO
Performed Procedure Step Description	0040,0254	LO		VNAP	SPEC
Request Attributes Sequence	0040,0275	SQ	UNDEFINED	ANAP	AUTO
> Scheduled Procedure Step Description	0040,0007	LO		ANAP	AUTO
> Scheduled Protocol Code Sequence	0040,0008	SQ	UNDEFINED	ANAP	AUTO
>> Code Value	0008,0100	SH		ANAP	AUTO
>> Coding Scheme Designator	0008,0102	SH		ANAP	AUTO
>> Code Meaning	0008,0104	LO		ANAP	AUTO
> Scheduled Procedure Step ID	0040,0009	SH		MAYBE	AUTO
> Requested Procedure ID	0040,1001	SH		ANAP	AUTO

Table 73: Grayscale Softcopy Presentation State Storage SOP Class - General Equipment Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	AUTO
Institution Name	0008,0080	LO	Hospital	ALWAYS	USER
Station Name	0008,1010	SH		ANAP	AUTO
Manufacturer's Model Name	0008,1090	LO	ViewForum	ALWAYS	AUTO
Device Serial Number	0018,1000	LO		ANAP	AUTO
Software Versions	0018,1020	LO	ViewForum 4.2 PMS1.1 MIMIT EVIIMDictionary	ALWAYS	AUTO

Table 74: Grayscale Softcopy Presentation State Storage SOP Class - SOP Common Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	0008,0005	CS	ISO_IR 100	ANAP	CONF
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.11.1	ALWAYS	AUTO
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO

Table 75: Grayscale Softcopy Presentation State Storage SOP Class - Presentation State Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Referenced Series Sequence	0008,1115	SQ	UNDEFINED	ALWAYS	AUTO
> Referenced Image Sequence	0008,1140	SQ	UNDEFINED	ALWAYS	AUTO
>> Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO
>> Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO
> Series Instance UID	0020,000E	UI		ALWAYS	AUTO
Shutter Presentation Value	0018,1622	US		ANAP	AUTO
Instance Number	0020,0013	IS		ALWAYS	AUTO
Presentation Label	0070,0080	CS	"AS LAST SEEN", "NEW AT IMPORT"	ALWAYS	AUTO
Presentation Description	0070,0081	LO		VNAP	AUTO
Presentation Creation Date	0070,0082	DA	Current Date	ALWAYS	AUTO
Presentation Creation Time	0070,0083	TM	Current Time	ALWAYS	AUTO
Presentation Creator's Name	0070,0084	PN	Surgery user	ALWAYS	AUTO

Table 76: Grayscale Softcopy Presentation State Storage SOP Class - Graphic Layer Module (C)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Graphic Layer Sequence	0070,0060	SQ	UNDEFINED	ANAP	USER
> Graphic Layer	0070,0002	CS	VFGFX	ANAP	AUTO
> Graphic Layer Order	0070,0062	IS		ANAP	AUTO
> Graphic Layer Recommended Display RGB Value	0070,0067	US	FFFF, FFFF, FFFF	ANAP	AUTO
> Graphic Layer Description	0070,0068	LO	ViewForum Graphics	ANAP	AUTO

Table 77: Grayscale Softcopy Presentation State Storage SOP Class - Graphic Annotation Module (C)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Graphic Annotation Sequence	0070,0001	SQ	UNDEFINED	ANAP	AUTO
> Referenced Image Sequence	0008,1140	SQ		ALWAYS	AUTO
>> Referenced SOP Class UID	0008,1150	UI	1.3.46.670589.2.3.1.1, 1.2.840.10008.5.1.4.1.1.12.1	ALWAYS	AUTO
>> Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO
> Graphic Layer	0070,0002	CS	Layer created on import VFGFX	ANAP	USER
>Text Object Sequence	0070,0008	SQ	UNDEFINED	ANAP	USER
>> Bounding Box Annotation Units	0070,0003	CS	PIXEL	ALWAYS	USER
>> Anchor Point Annotation Units	0070,0004	CS	PIXEL	ALWAYS	USER
>> Unformatted Text Value	0070,0006	ST		ANAP	USER
>> Bounding Box Top Left Hand Corner	0070,0010	FL		ALWAYS	USER
>> Bounding Box Bottom Right Hand Corner	0070,0011	FL		ALWAYS	USER
>> Bounding Box Text Horizontal Justification	0070,0012	CS	CENTER, LEFT, RIGHT	ALWAYS	USER
>> Anchor Point	0070,0014	FL		ALWAYS	USER
>> Anchor Point Visibility	0070,0015	CS	N, Y	ALWAYS	USER
> Graphic Object Sequence	0070,0009	SQ	UNDEFINED	ANAP	USER
>> Graphic Annotation Units	0070,0005	CS	PIXEL	ALWAYS	USER
>> Graphic Dimensions	0070,0020	US		ALWAYS	USER
>> Number of Graphics Points	0070,0021	US		ALWAYS	USER
>> Graphic Data	0070,0022	FL		ALWAYS	USER
>> Graphic Type	0070,0023	CS	CIRCLE, ELLIPSE, INTERPOLATED, POINT, POLYLINE	ALWAYS	USER
>> Graphic Filled	0070,0024	CS	Y, N	ANAP	USER

Table 78: Grayscale Softcopy Presentation State Storage SOP Class - Softcopy VOI LUT Module (C)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Softcopy VOI LUT Sequence	0028,3110	SQ	UNDEFINED	ALWAYS	SPEC
> Referenced Image Sequence	0008,1140	SQ	UNDEFINED	ANAPC	AUTO
>> Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO
>> Referenced SOP Instance UID	0008,1155	UI		ANAPC	AUTO
>> Referenced Frame Number	0008,1160	IS		ANAPC	AUTO
> Window Center	0028,1050	DS		ANAPC	AUTO
> Window Width	0028,1051	DS		ANAPC	AUTO

Table 79: Softcopy Presentation Storage SOP Class – Softcopy Presentation LUT Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Presentation LUT Sequence	2050,0010	SQ	UNDEFINED	ANAP	AUTO
> LUT Descriptor	0028,3002	US		ALWAYS	AUTO
> LUT Data	0028,3006	US		ALWAYS	AUTO
Presentation LUT Shape	2050,0020	CS	INVERSE, IDENTITY	ANAPC	AUTO

Table 80: Grayscale Softcopy Presentation State Storage SOP Class - Displayed Area Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Displayed Area Selection Sequence	0070,005A	SQ	UNDEFINED	ALWAYS	AUTO
> Displayed Area Top Left Hand Corner	0070,0052	SL	1, 1	ALWAYS	AUTO
> Displayed Area Bottom Right Hand Corner	0070,0053	SL	1024, 1024	ALWAYS	AUTO
> Presentation Size Mode	0070,0100	CS	SCALE TO FIT	ALWAYS	AUTO
> Presentation Pixel Spacing	0070,0101	DS	Required if Presentation Size Mode (0070,0100) is TRUE SIZE. May be present if Presentation Size Mode (0070,0100) is SCALE TO FIT or MAGNIFY.	ANAPC	AUTO
Presentation Pixel Aspect Ratio	0070,0102	IS	N, N	ANAPC	AUTO

Table 81: Grayscale Softcopy Presentation State Storage SOP Class - Presentation Series Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	0008,0060	CS	PR = Presentation State	ALWAYS	AUTO

8.1.2 Usage of Attributes from Received IOD's.

On the VF Surgical Workstation AE system it is possible to make Snap Shots from image(s) and exports these Snap Shots, Captured Image(s), as Photo or as Original image data to DVD.

8.1.2.1 Captured Image as Photo(s).

Information Entity	Module Name	Usage
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
	SC Image Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	SOP Common Module	ALWAYS

Name	Tag	VR	Presence of Value	Source	Comment
Patient Module (M)					
Patient's Name	0010,0010	PN	ALWAYS	COPY	-
Patient ID	0010,0020	LO	VNAP	COPY	-
Patient's Birth Date	0010,0030	DA	VNAP	COPY	-
Patient's Sex	0010,0040	CS	VNAP	COPY	-
General Study Module (M)					
Study Date	0008,0020	DA	VNAP	COPY	Date on which this Study was created.
Study Time	0008,0030	TM	VNAP	COPY	Time on which this Study was created.
Accession Number	0008,0050	SH	VNAP	COPY	-
Referring Physician's Name	0008,0090	PN	VNAP	COPY	-
Study Description	0008,1030	LO	ALWAYS	USER	-
Study Instance UID	0020,000D	UI	ALWAYS	COPY	-
Study ID	0020,0010	SH	ALWAYS	AUTO	ReviewFolder
General Series Module (M)					
Series Date	0008,0021	DA	ALWAYS	AUTO	-
Series Time	0008,0031	TM	ALWAYS	AUTO	-
Protocol Name	0018,1030	LO	ALWAYS	USER	-
Series Instance UID	0020,000E	UI	ALWAYS	AUTO	-
Series Number	0020,0011	IS	ALWAYS	AUTO	-
Performed Procedure Step Start Date	0040,0244	DA	ALWAYS	COPY	-
Performed Procedure Step Start Time	0040,0245	TM	ALWAYS	COPY	-
General Equipment Module (M)					
Manufacturer	0008,0070	LO	ALWAYS	COPY	Philips Medical Systems
Institution Name	0008,0080	LO	ANAP	COPY	-
Manufacturer's Model Name	0008,1090	LO	ALWAYS	AUTO	ViewForum

Name	Tag	VR	Presence of Value	Source	Comment
Software Version(s)	0018,1020	LO	ALWAYS	AUTO	ViewForum 4.2 PMS1.1 MIMIT EVIIMDictionary
SC Image Equipment Module (M)					
Modality	0008,0060	CS	ALWAYS	AUTO	OT
Conversion Type	0008,0064	CS	ALWAYS	AUTO	WSD
General Image Module (M)					
Image Type	0008,0008	CS	ALWAYS	AUTO	DERIVED, SECONDARY
Acquisition Date	0008,0022	DA	ALWAYS	AUTO	-
Content Date	0008,0023	DA	ALWAYS	AUTO	-
Acquisition Time	0008,0032	TM	ALWAYS	AUTO	-
Content Time	0008,0033	TM	ALWAYS	AUTO	-
Image Pixel Module (M)					
Samples per Pixel	0028,0002	US	ALWAYS	AUTO	3
Photometric Interpretation	0028,0004	CS	ALWAYS	AUTO	RGB
Planar Configuration	0028,0006	US	ALWAYS	AUTO	0
Rows	0028,0010	US	ALWAYS	AUTO	1024
Columns	0028,0011	US	ALWAYS	AUTO	1024
Bits Allocated	0028,0100	US	ALWAYS	AUTO	8
Bits Stored	0028,0101	US	ALWAYS	AUTO	8
High Bit	0028,0102	US	ALWAYS	AUTO	7
Pixel Representation	0028,0103	US	ALWAYS	AUTO	0
Pixel Data	7FE0,0010	OW	ALWAYS	AUTO	-
SOP Common Module (M)					
Specific Character Set	0008,0005	CS	ALWAYS	COPY	-
SOP Class UID	0008,0016	UI	ALWAYS	AUTO	1.2.840.10008.5.1.4.1.1.7 (SC Image)
SOP Instance UID	0008,0018	UI	ALWAYS	AUTO	-

8.1.2.2 Captured Image(s) as Original.

The Captured Images contains the following Modules:

Information Entity	Module Name	Usage
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
	Multi-Frame Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	X-ray Image Module	ALWAYS
	X-ray Acquisition Module	ALWAYS
	SOP Common Module	ALWAYS

Name	Tag	VR	Presence of Value	Source	Comment
Patient Module (M)					
Patient's Name	0010,0010	PN	ALWAYS	COPY	-

Name	Tag	VR	Presence of Value	Source	Comment
Patient ID	0010,0020	LO	VNAP	COPY	-
Patient's Birth Date	0010,0030	DA	VNAP	COPY	-
Patient's Sex	0010,0040	CS	VNAP	COPY	-
General Study Module (M)					
Study Date	0008,0020	DA	VNAP	COPY	Date on which this Study was created.
Study Time	0008,0030	TM	VNAP	COPY	Time on which this Study was created.
Accession Number	0008,0050	SH	VNAP	COPY	-
Referring Physician's Name	0008,0090	PN	VNAP	COPY	-
Study Description	0008,1030	LO	ALWAYS	USER	-
Study Instance UID	0020,000D	UI	ALWAYS	COPY	-
Study ID	0020,0010	SH	VNAP	COPY	ReviewFolder
General Series Module (M)					
Series Date	0008,0021	DA	ANAP	AUTO	-
Series Time	0008,0031	TM	ANAP	AUTO	-
Modality	0008,0060	CS	ALWAYS	COPY	-
Protocol Name	0018,1030	LO	ALWAYS	USER	-
Series Instance UID	0020,000E	UI	ALWAYS	AUTO	-
Series Number	0020,0011	IS	VNAP	AUTO	-
Performed Procedure Step Start Date	0040,0244	DA	ANAP	COPY	-
Performed Procedure Step Start Time	0040,0245	TM	ANAP	COPY	-
General Equipment Module (M)					
Manufacturer	0008,0070	LO	ALWAYS	COPY	Philips Medical Systems
Institution Name	0008,0080	LO	VNAP	COPY	-
Manufacturer's Model Name	0008,1090	LO	ALWAYS	AUTO	ViewForum
Software Version(s)	0018,1020	LO	ALWAYS	AUTO	ViewForum 4.2 PMS1.1 MIMIT EVIIMDictionary
Multi-Frame Module (M)					
Number of Frames	0028,0008	IS	ALWAYS	AUTO	-
Frame Increment Pointer	0028,0009	AT	ALWAYS	AUTO	-
General Image Module (M)					
Acquisition Date	0008,0022	DA	ALWAYS	AUTO	-
Content Date	0008,0023	DA	ALWAYS	AUTO	-
Acquisition Time	0008,0032	TM	ALWAYS	AUTO	-
Content Time	0008,0033	TM	ALWAYS	AUTO	-
Instance Number	0020,0013	IS	ALWAYS	AUTO	-
Image Pixel Module (M)					
Rows	0028,0010	US	ALWAYS	AUTO	-
Columns	0028,0011	US	ALWAYS	AUTO	-
Pixel Data	7FE0,0010	OW	ALWAYS	AUTO	-
X-ray Image Module (M)					
Image Type	0008,0008	CS	ALWAYS	AUTO	ORIGIONAL PRIMARY SINGLE PLANE
Samples per Pixel	0028,0002	US	ALWAYS	AUTO	1
Photometric Interpretation	0028,0004	CS	ALWAYS	AUTO	MONOCHROME2
Bits Allocated	0028,0100	US	ALWAYS	AUTO	-
Bits Stored	0028,0101	US	ALWAYS	AUTO	-
High Bit	0028,0102	US	ALWAYS	AUTO	-

Name	Tag	VR	Presence of Value	Source	Comment
Pixel Representation	0028,0103	US	ALWAYS	AUTO	0
Pixel Intensity Relationship	0028,1040	CS	ALWAYS	AUTO	DISP
X-ray Acquisition Module (M)					
Radiation Setting	0018,1155	CS	ALWAYS	AUTO	GR
SOP Common Module (M)					
Specific Character Set	0008,0005	CS	ALWAYS	COPY	-
SOP Class UID	0008,0016	UI	ALWAYS	AUTO	Depends of SOP Class
SOP Instance UID	0008,0018	UI	ALWAYS	AUTO	-

8.1.3 Attribute Mapping

Not Applicable.

8.1.4 Coerced/Modified fields

In general, the VF Surgical Workstation AE will try and optimize the imported image data. This may involve the removal of redundant data, either or not due to the creation of a Presentation State object for the image data. This may also involve the creation of extra attributes. As it is not the intention of the VF Surgical Workstation AE to export this data as such, the SOP Instance UID shall not be changed.

If not available at import then the VF Surgical Workstation AE will create the additional attributes as listed in Table 82.

Table 82: Additional Attributes for VF Surgical Workstation AE

Name	Tag	Generated Value
Performed Procedure Step Start Date	0040,0244	Copied from (0008,0020) Study Date.
Performed Procedure Step Start Time	0040,0245	Copied from (0008,0030) Study Time.
Performed Procedure Step ID	0040,0253	Copied from (0020,0010) Study ID.
Performed Procedure Step Description	0040,0254	Copied from (0008,1030) Study Description.

If the SCU does not propose a presentation context for the Grayscale Softcopy Presentation State storage SOP class, then the VF Surgical Workstation AE will derive Presentation State data from the imported image data and store this data in a new series within the examination of the imported image.
However, if during import the image is accompanied by Presentation State data, the VF Surgical Workstation AE database shall avoid data overlap by only storing the relevant data from the first object received; either the first image or its Presentation State!
Thus it will omit data received by succeeding objects concerning the optional attributes (VT=3) listed in Table 83, and clear all mandatory attributes (VT=2) listed in Table 84 .

Table 83: Omitted Attributes for VF Surgical Workstation AE

Name	Tag
Patient Module	
Referenced Patient Sequence	0008,1120
Patient's Birth Time	0010,0032

Name	Tag
Other Patient Ids	0010,1000
Other Patient Names	0010,1001
Ethnic Group	0010,2160
Patient Comments	0010,4000
General Study Module	
Referring Physician Identification Sequence	0008,0096
Study Description	0008,1030
Procedure Code Sequence	0008,1032
Physician(s) of Record	0008,1048
Physician(s) of Record Identification Sequence	0008,1049
Name of Physician(s) Reading Study	0008,1060
Physician(s) Reading Study Identification Sequence	0008,1062
Referenced Study Sequence	0008,1110
Patient Study Module	
Admitting Diagnoses Description	0008,1080
Admitting Diagnoses Code Sequence	0008,1084
Patient's Age	0010,1010
Patient's Size	0010,1020
Patient's Weight	0010,1030
Occupation	0010,2180
Additional Patient History	0010,21B0
Clinical Trial Study Module	
Clinical Trial Time Point Description	0012,0051
General Series Module	
Series Date	0008,0021
Series Time	0008,0031
Series Description	0008,103E
Performing Physicians' Name	0008,1050
Performing Physician Identification Sequence	0008,1052
Operators' Name	0008,1070
Operators Identification Sequence	0008,1072
Referenced Performed Procedure Step Sequence	0008,1111
Body Part Examined	0018,0015
Protocol Name	0018,1030
Smallest Pixel Value in Series	0028.0108
Largest Pixel Value in Series	0028.0109
Performed Procedure Step Start Date	0040,0244
Performed Procedure Step Start Time	0040,0245
Performed Procedure Step ID	0040,0253
Performed Procedure Step Description	0040,0254
Performed Protocol Code Sequence	0040,0260
Request Attributes Sequence	0040,0275
Comments on the Performed Procedure Step	0040,0280
General Equipment Module	
Institution Name	0008,0080
Institution Address	0008,0081
Station Name	0008,1010
Institutional Department Name	0008,1040
Manufacturer's Model Name	0008,1090
Device Serial Number	0018,1000
Software Versions	0018,1020
Spatial Resolution	0018,1050
Date of Last Calibration	0018,1200
Time of Last Calibration	0018,1201

Name	Tag
Pixel Padding Value	0028,0120
Display Shutter Module	
Shutter Presentation Value	0018,1622
Overlay Plane Module	
Overlay Description	60xx,0022
Overlay Subtype	60xx,0045
ROI Area	60xx,1301
ROI Mean	60xx,1302
ROI Standard Deviation	60xx,1303
Overlay Label	60xx,1500
SOP Common Module	
Instance Creation Date	0008,0012
Instance Creation Time	0008,0013
Instance Creator UID	0008,0014
Coding Scheme Identification Sequence	0008,0110
Timezone Offset From UTC	0008,0201
Contributing Equipment Sequence	0018,A001
Instance Number	0020,0013
SOP Instance Status	0100,0410
SOP Authorization Date and Time	0100,0420
SOP Authorization Comment	0100,0424
Authorization Equipment Certification Number	0100,0426
MAC Parameters Sequence	4FFE,0001
Digital Signatures Sequence	FFFA,FFFA

Table 84: Cleared Attributes for VF Surgical Workstation AE

Name	Tag
Patient Module	
Patient's Name	0010,0010
Patient ID	0010,0020
Patient's Birth Date	0010,0030
Patient's Sex	0010,0040
Clinical Trial Subject Module	
Clinical Trial Protocol Name	0012,0021
Clinical Trial Site ID	0012,0030
Clinical Trial Site Name	0012,0031
General Study Module	
Study Date	0008,0020
Study Time	0008,0030
Accession Number	0008,0050
Referring Physician's Name	0008,0090
Study ID	0020,0010
Clinical Trial Study Module	
Clinical Trial Time Point ID	0012,0050
General Series Module	
Patient Position	0018,5100
Series Number	0020,0011
Laterality	0020,0060
Clinical Trial Series Module	
Clinical Trial Coordinating Center Name	0012,0060
General Equipment Module	

Name	Tag
Manufacturer	0008,0070
Mask Module	
Recommended Viewing Mode	0028,1090
Overlay/Curve Activation Module	
Curve Activation Layer	50xx,1001
Overlay Activation Layer	60xx,1001

The VF Surgical Workstation AE allows the operator to modify attributes of the stored images; see Table 85.
The VF Surgical Workstation AE does not modify the pixel values of the stored images. Modified images retain their original Study, Series and Image UID.

Table 85: Modifiable Attributes

Name	Tag
Patient	
Patient's Name	0010,0010
Patient ID	0010,0020
Patient's Birth Date	0010,0030
Patient's Sex	0010,0040
Medical Alerts	0010,2000
Contrast Allergies	0010,2110
Patient Comments	0010,4000
Study	
Accession Number	0008,0050
Referring Physician's Name	0008,0090
Study Description	0008,1030
Physician(s) of Record	0008,1048
Name of Physician(s) Reading Study	0008,1060
Admitting Diagnoses Description	0008,1080
Patient's Age	0010,1010
Occupation	0010,2180
Additional Patient History	0010,21B0
Examination	
Performed Station Name	0040,0242
Performed Location	0040,0243
Performed Procedure Step Description	0040,0254
Performed Procedure Type Description	0040,0255
Comments on the Performed Procedure Step	0040,0280
Series	
-	-

8.2 Data Dictionary of Private Attributes

Not applicable.

8.3 Coded Terminology and Templates

The BV Family does not support any coded terminology or templates.

8.4 Grayscale Image consistency

The high-resolution display monitor attached to the BV Family can be calibrated by using the service tool together with a light probe. See the [VFRB] for details on the calibration procedure.

8.5 Standard Extended/Specialized/Private SOPs

The VF Surgical Workstation AE supports the following private SOP classes.

Table 86: Private SOP Classes

SOP Class	
Name	**UID**
Specialized X-Ray	1.3.46.670589.2.3.1.1
CX Image	1.3.46.670589.2.4.1.1
3D Volume Storage	1.3.46.670589.5.0.1.1
3D Volume Object Storage	1.3.46.670589.5.0.2.1
Surface Storage	1.3.46.670589.5.0.3.1
MR Cardio Storage	1.3.46.670589.5.0.8.1
CT Synthetic Image	1.3.46.670589.5.0.9
MR Synthetic Image	1.3.46.670589.5.0.10
MR Cardio Analysis Storage	1.3.46.670589.5.0.11.1
CX Synthetic Image	1.3.46.670589.5.0.12
Perfusion	1.3.46.670589.5.0.13
Perfusion Analysis	1.3.46.670589.5.0.14

8.6 Private Transfer Syntaxes

The BV Family does not support any private transfer syntaxes.