



# DICOM Conformance Statement

## Vidan2

Release 1.0

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## 1 Conformance Statement Overview

Vidan2 is a software product running on Windows OS to collect Media Files, convert them into a DICOM compliant format and store the converted instances to a PACS.

It provides the following DICOM features:

- Query the information system (Department System Scheduler) for a Modality Worklist.
- Save acquired images to the Image Archive (PACS).

Table 1 presents an overview of the DICOM network services supported Vidan2.

**Table 1: Network Services**

| SOP Classes                                | User of Service (SCU) | Provider of Service (SCP) |
|--|-----------------------|---------------------------|
| <b>Transfer</b>                            |                       |                           |
| Visible Light Photographic Image Storage   | Yes                   | No                        |
| Video Photographic Image Storage           | Yes                   | No                        |
| Ultrasound Image Storage                   | Yes                   | No                        |
| Ultrasound Multi-Frame Image Storage       | Yes                   | No                        |
| <b>Workflow Management</b>                 |                       |                           |
| Modality Worklist Information Model – FIND | Yes                   | No                        |

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### 3 Introduction

#### 3.1 Revision History

The revision history provides dates and differences of the different releases Vidan2.

| Version | Date       | Autor          | Chapter | Remarks                    |
|---------|------------|----------------|---------|----------------------------|
| 1       | 29.03.2018 | Samuel Landree | All     | Initial version for Vidan2 |
| 1.1     | 28.05.2018 | Samuel Landree |         | Add Ultrasound             |

#### 3.2 Audience

This Conformance Statement is intended for:

- (potential) customers,
- marketing staff interested in system and data exchange functionality,
- support engineers and system integrators of medical equipment,
- software designers and implementers of DICOM interfaces.
- It is assumed that the reader is familiar with the DICOM standard.

#### 3.3 Remarks

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

##### **Interoperability**

Integration of (networked) systems may require application functions that are not specified within the scope of DICOM.

It is the user's (or a user's agent) responsibility to analyse the application requirements and to specify a solution that integrates different vendor's equipment.

##### **Validation**

If the comparison of Conformance Statements indicate that the required information exchange should be possible, additional validation tests will be necessary.

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.

#### 3.4 Contents and structure

The DICOM Conformance Statement is contained in chapter 2 through 7 and follows the contents and structuring requirements of DICOM PS 3.2-2011.

#### 3.5 Used definitions and terms

For a description of these, see NEMA PS 3.3-2011 and PS 3.4-2011.

### 3.6 Abbreviations

The following acronyms and abbreviations are used in the document.

|        |   |
|--------|---|
| ACR    | American College of Radiology                   |
| AE     | Application Entity                              |
| ANSI   | American National Standard Institute            |
| CD-R   | Compact Disk Recorder                           |
| DICOM  | Digital Imaging and Communication in Medicine   |
| FSC    | File Set Creator                                |
| GUI    | Graphical User Interface                        |
| HIS    | Hospital Information System                     |
| IOD    | Image Object Definition                         |
| MWL    | Modality Worklist Query/Retrieve                |
| N.A.   | Not applicable                                  |
| NEMA   | National Electric Manufacturers Association     |
| NM     | Nuclear Medicine                                |
| OS     | Operating System                                |
| PACS   | Picture Archiving and Communication System      |
| PDU    | Protocol Data Unit                              |
| RIS    | Radiology Information System                    |
| RWA    | Real World Activity                             |
| SC     | Secondary Capture/Service Class                 |
| SCP    | Service Class Provider                          |
| SCU    | Service Class User                              |
| SOP    | Service Object Pair                             |
| TCP/IP | Transmission Control Protocol/Internet protocol |
| UID    | Unique Identifier                               |
| US     | Ultra Sound                                     |
| VR     | Value Representation                            |

### 3.7 References

[DICOM] The Digital Imaging and Communications in Medicine (DICOM) standard:  
NEMA PS 3.X.

National Electrical Manufacturers Association (NEMA) Publication Sales  
1300 N. 17th Street, Suite 1847  
Rosslyn, Va. 22209, United States of America

[DicomNet] DEKOM ENGINEERING DicomNet Systems Product Line  
DEKOM ENGINEERING GmbH (see address at page ii)

## 4 Networking

### 4.1 Implementation Model

Vidan2 is a Software to capture images and video from a camera and convert the Media to DICOM. It is part of the DicomNet product line of DEKOM ENGINEERING, which provides storage, exchange and viewing network functionality on Windows based systems.

The Vidan2 connectivity feature with the DICOM Module is to gather Patient / Study data from a Department System Scheduler using DICOM MWL, capture images from a camera and store those Images to an Image Archive using DICOM C-STORE operation.

The above DICOM functionality is described in this document.

#### 4.1.1 Application Data Flow

Two Application Entities (AE), Worklist AE and Store AE can represent the Vidan2 system.

The related implementation model for the AEs is shown in the next figure.

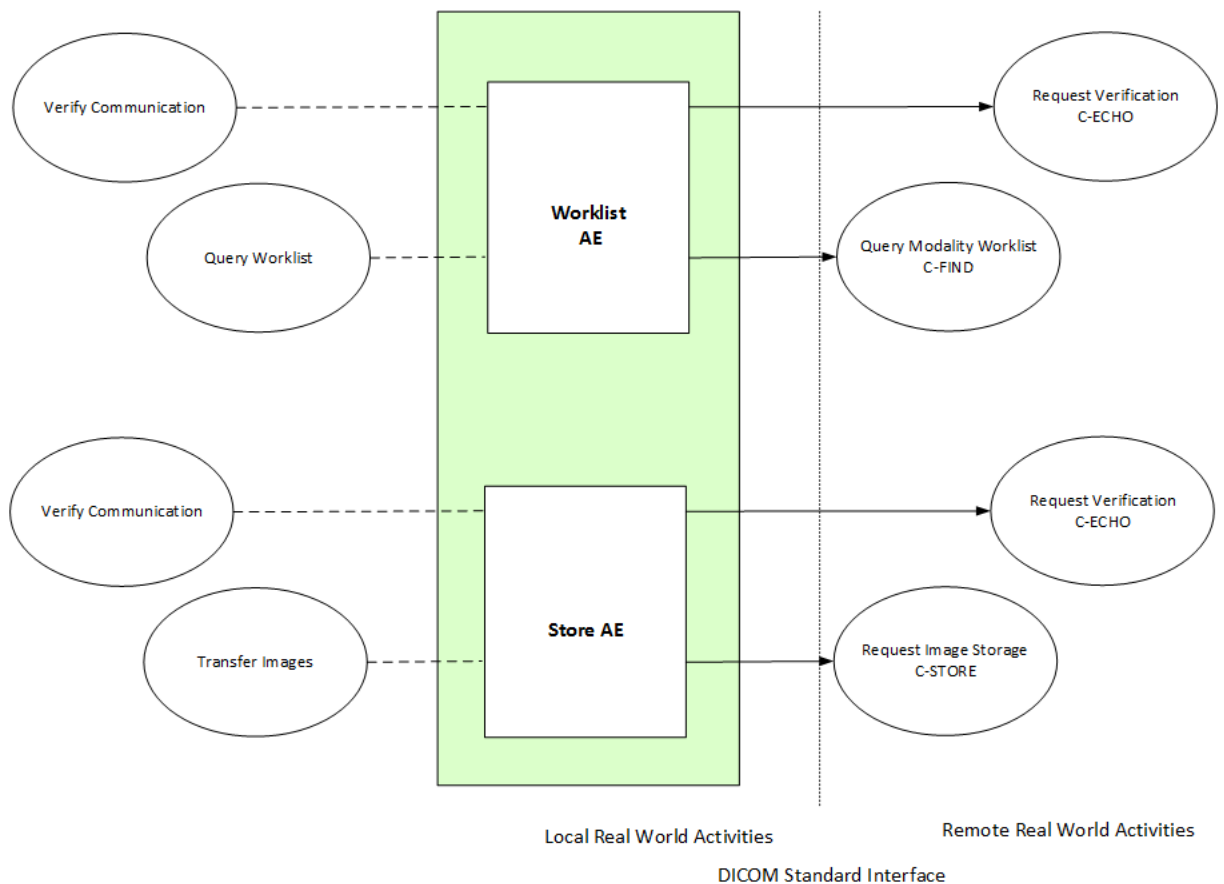


Figure 1: The Vidan2 Application Data Flow Diagram

## **4.1.2 Functional definition of Application Entities**

This section describes in general terms the functions performed by Worklist AE and Store AE.

### **4.1.2.1 Functional Definition of Worklist AE**

#### **4.1.2.1.1 Basic Worklist Management Service Class**

The Worklist AE can perform a manual and/or cyclic update of its internal schedule data base by acting as a SCU of the Basic Worklist Management Service Class. The local RWA "Update Worklist" initiates a request for a list of scheduled examinations from the (one, preconfigured) Department System Scheduler and updates its internal data base. No duplicate entries will be added.

The content of the updated schedule data base is presented to the user by the GUI.

#### **4.1.2.1.2 Verification Service Class**

The Worklist AE can perform the Verification Service as SCU to the (one, preconfigured) Department System Scheduler. This is triggered by the operator in the service mode.

The Worklist AE performs the Verification Service as SCU to the (one, preconfigured) system in a cyclic manner to ensure the connectivity and displays a warning to the user if the verification fails.

### **4.1.2.2 Functional Definition of Store AE**

#### **4.1.2.2.1 Storage Service Class**

The Store AE acts as a SCU of the Storage Service Class. When the export is initiated through the local RWA "Transfer Images" the Store AE will open an association to the configured remote system and convert the acquired images and related data to a DICOM message to be sent to the remote system. The local RWA "Transfer Images" is triggered by user interaction.

#### **4.1.2.2.2 Verification Service Class**

The Store AE can perform the Verification Service as SCU to the configured PACS system. This is triggered by the operator in the service mode.

The Store AE performs the Verification Service as SCU to the (one, preconfigured) system in a cyclic manner to ensure the connectivity and displays a warning to the user if the verification fails.



### 4.1.3 Sequencing of Real World Activities

The following sequence of Real World Activities are supported by Vidan2.

- The Worklist AE queries the Department System Scheduler for an update of the scheduled procedure steps in a cyclic manner and/or triggered by manual user input “update Worklist” and updates its internal worklist data base accordingly.
- The user selects the appropriate entry from the internal worklist data base represented in the GUI.
- The user starts the image acquisition, triggered by external contacts (e.g. foot switch) or by user interface. Acquired images are saved to the local image data base.
- The user completes the examination, as a result the images are converted to DICOM IODs and the Store AE is triggered to send the C-STORE-RQ messages containing the image information to the configured image archive.
- In the case the system is working offline or a store operation fails, the user may select an examination from Vidan2 local archive and initiate a STORE operation.

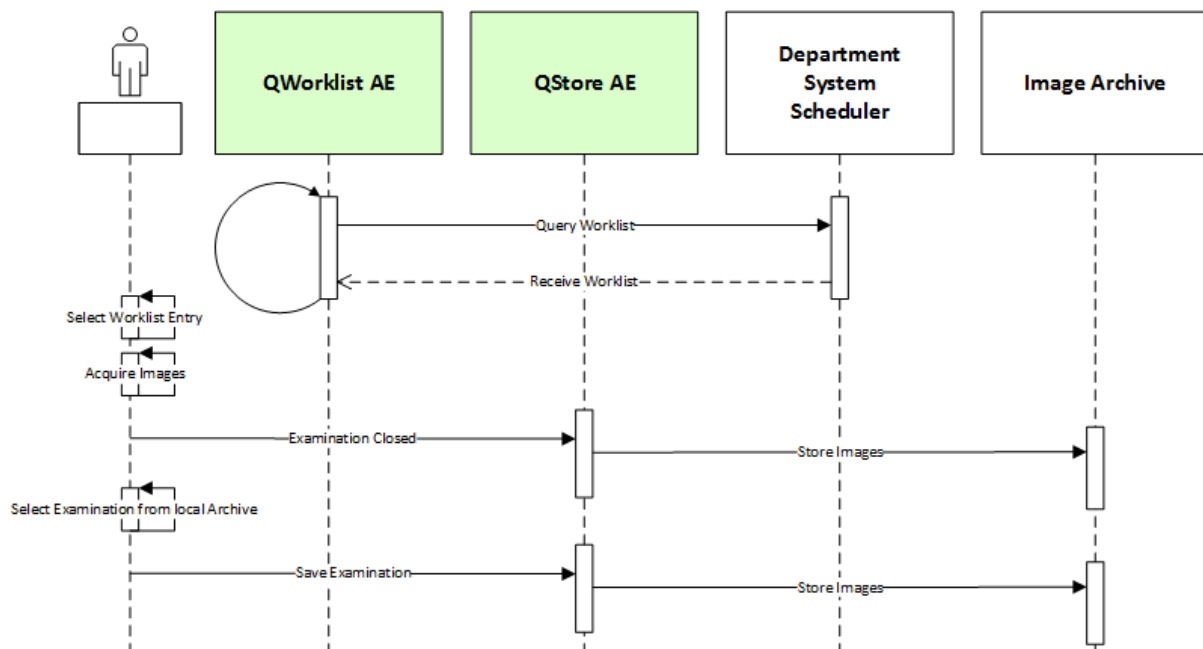


Figure 2: The Vidan2 Sequence of Real World Activities

## 4.2 AE Specifications

### 4.2.1 Worklist AE

#### 4.2.1.1 SOP Classes

The Vidan2 Worklist AE provides Standard Conformance to the following DICOM V 3.0 SOP classes as an SCU.

**Table 2: Supported SOP Classes for Worklist AE**

| SOP Class Name                             | SOP Class UID          | SCU | SCP |
|--|------------------------|-----|-----|
| Verification                               | 1.2.840.10008.1.1      | Yes | No  |
| Modality Worklist Information Model – FIND | 1.2.840.10008.5.1.4.31 | Yes | No  |

The Vidan2 Worklist AE does not support DICOM V 3.0 SOP Classes as an SCP.

#### 4.2.1.2 Association Policies

##### 4.2.1.2.1 General

The DICOM standard application context name for DICOM 2.0 is always proposed as presented in Table 3. The PDU size is configurable from a minimum of 4096 bytes.

**Table 3: DICOM Application Context**

|                          |                       |
|--------------------------|-----------------------|
| Application Context Name | 1.2.840.10008.3.1.1.1 |
|--------------------------|-----------------------|

##### 4.2.1.2.2 Number of Associations

Worklist AE will establish a maximum of two associations at a time. Based on local activities, one association may perform Application Level Communication Verification, another association may be used C-FIND operations.

**Table 4: Number of Associations as an Association Initiator for Worklist AE**

|   |   |
|---|---|
| Maximum number of simultaneous associations | 2 |
|---|---|

Worklist AE will not handle incoming associations.

**Table 5: Number of Associations as an Association Acceptor for Worklist AE**

|   |      |
|---|------|
| Maximum number of simultaneous associations | N.A. |
|---|------|

##### 4.2.1.2.3 Asynchronous Nature

Worklist AE does not support asynchronous operations and will not perform asynchronous window negotiation.

**Table 6: Asynchronous Nature as an Association Initiator for Worklist AE**

|   |      |
|---|------|
| Maximum number of outstanding asynchronous transactions | N.A. |
|---|------|

#### 4.2.1.2.4 Implementation Identifying Information

The implementation information for Worklist AE is:

**Table 7: DICOM Implementation Class and Version for Worklist AE**

|                             |                          |
|-----------------------------|--------------------------|
| Implementation Class UID    | 2.16.840.1.113669.632.16 |
| Implementation Version Name | QDICNET_3X *             |

\* X identifies the version number of the DICOM module.

#### 4.2.1.3 Association Initiation Policy

The Worklist AE initiates associations as a result of the following events:

- The internal timer for cyclic Worklist Update expires (see 4.2.1.3.1).
- The user requests a worklist update manually (see 4.2.1.3.1).
- The internal timer for cyclic Connectivity Check expires (see 4.2.1.3.2).
- In the service mode, the operator verifies application level communication (see 4.2.1.3.2).

##### 4.2.1.3.1 Update Worklist

###### 4.2.1.3.1.1 Description and Sequencing of Activities

For each Broad Worklist Request, the Worklist AE opens an association to the Basic Worklist SCP and sends a C-FIND request. After retrieval of all responses the association is closed. The internal schedule database is updated by the returned worklist items and presented to the user.

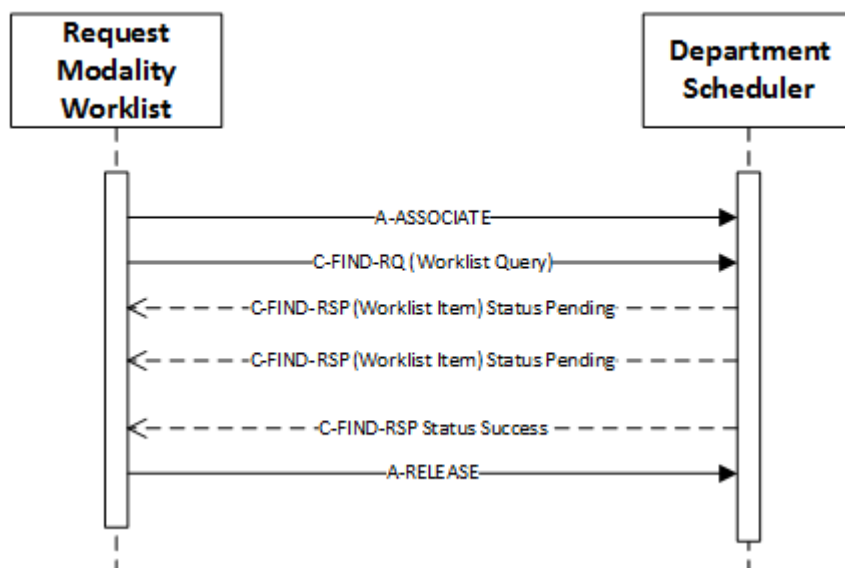


Figure 3: Sequencing of RWA Update Worklist

#### 4.2.1.3.1.2 Proposed Presentation Contexts

The presentation context proposed by Worklist AE Update Worklist is defined in Table 8.

The implementation will choose ELE transfer syntax in the case multiple transfer syntaxes are accepted by the SCP.

**Table 8: Proposed Presentation Contexts for Worklist AE Update Worklist**

| Presentation Context table                           |                        |                 |  |      |                      |
|--|------------------------|-----------------|--|------|----------------------|
| Abstract Syntax                                      |                        | Transfer Syntax |  | Role | Extended Negotiation |
| Name   | UID                    | Name List       | UID List                                 |      |                      |
| Modality Worklist Information Model - FIND SOP Class | 1.2.840.10008.5.1.4.31 | ILE<br>ELE      | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.1 | SCU  | None                 |

#### 4.2.1.3.1.3 SOP Specific Conformance for Update Worklist

Note:

Worklist attributes, their usage as search key, their display in the GUI and mapping to IOD values is highly configurable. The following tables reflects the default settings after installation.

Vidan2's Update Worklist supports Broad Worklist Queries with all required search keys.

Table 9 describes the supported search keys. The Broad Worklist Query shall return all scheduled procedure steps for the own modality or modality AE.

**Table 9: Search Key Attributes for Worklist AE Update Worklist**

| Module Name<br>Attribute Name                                | Tag       | VR | M        | Query Value  |
|--|-----------|----|----------|--|
| Scheduled Procedure Step<br>Schedule Procedure Step Sequence | 0040,0100 | SQ |          |  |
| Scheduled Station AE Title                                   | 0040,0001 | AE | S /<br>W | Configurable, local AET or "*"                       |
| Scheduled Procedure Step Start Date                          | 0040,0002 | DA | S / R    | Actual Date or Date Range based on the Configuration |
| Scheduled Station Name                                       | 0040,0010 | SH | S /<br>W | Configurable, Station Name or "*"                    |
| Modality   | 0008,0060 | CS | S        | Modality   |

The above table should be read as follows:

Tag: DICOM tag for this attribute.

VR: DICOM VR for this attribute.

M: Matching keys for worklist update, a "S" indicates Single Value Matching, a "R" indicates Range Matching, a "W" indicates Wild Card Matching.

Table 10 below presents the Worklist request identifier of Worklist AE Update Worklist queries and specifies if the attributes presented in the GUI as well as attributed copied to the image IODs. Unexpected attributes in the returned response are ignored, unsupported attributes (by the SCP) are set to have no value.

Table 10: Worklist Request Identifier for Worklist AE Update Worklist

| Module Name<br>Attribute Name          | Tag       | VR | UI | IOD | Notes      |
|--|-----------|----|----|-----|------------|
| SOP Common Module                      |           |    |    |     |            |
| Specific Character Set                 | 0008,0005 | CS |    |     | ISO_IR 100 |
| Patient Identification Module          |           |    |    |     |            |
| Patient's Name                         | 0010,0010 | PN | *  | *   |            |
| Patient ID                             | 0010,0020 | LO | *  | *   |            |
| Patient Demographic Module             |           |    |    |     |            |
| Patient's Birth Date                   | 0010,0030 | DA | *  | *   |            |
| Patients' Sex                          | 0010,0040 | CS | *  | *   |            |
| Patient Medical Module                 |           |    |    |     |            |
| Visit Relationship Module              |           |    |    |     |            |
| Visit Status Module                    |           |    |    |     |            |
| Scheduled Procedure Step Module        |           |    |    |     |            |
| Scheduled Procedure Step Sequence      | 0040,0100 | SQ |    |     |            |
| >Modality                              | 0008,0060 | CS | *  | *   |            |
| >Scheduled Station AE Title            | 0040,0001 | AE |    |     |            |
| >Scheduled Procedure Step Start Date   | 0040,0002 | DA | *  | *   |            |
| >Scheduled Procedure Step Start Time   | 0040,0003 | TM | *  | *   |            |
| >Scheduled Performing Physician's Name | 0040,0006 | PN | *  | *   |            |
| >Scheduled Procedure Step Description  | 0040,0007 | LO | *  | *   |            |
| >Scheduled Protocol Code Sequences     | 0040,0008 | SQ |    |     |            |
| >>Code Value                           | 0008,0100 | SH |    |     |            |
| >>Coding Scheme Designator             | 0008,0102 | SH |    |     |            |
| >>Code Meaning                         | 0008,0104 | LO |    |     |            |
| >Scheduled Procedure Step ID           | 0040,0009 | SH |    |     |            |
| Requested Procedure Module             |           |    |    |     |            |
| Referenced Study Sequence              | 0008,1110 | SQ |    |     |            |
| >Referenced SOP Class UID              | 0008,1150 | UI |    |     |            |
| >Referenced SOP Instance UID           | 0008,1155 | UI |    |     |            |
| Study Instance UID                     | 0020,000D | UI |    | *   |            |
| Requested Procedure Description        | 0032,1060 | LO |    |     |            |
| Requested Procedure ID                 | 0040,0101 | SH |    |     |            |
| Image Service Request Module           |           |    |    |     |            |
| Accession Number                       | 0008,0050 | SH | *  | *   |            |
| Referring Physician's Name             | 0008,0090 | PN |    | *   |            |

The behavior of the Worklist AE for status codes in a Modality Worklist C-FIND response is presented in Table 11.

**Table 11: Response Status Handling Behavior for Worklist AE Update Worklist**

| Service Status | Error Code     | Further Meaning  | Behavior   |
|----------------|----------------|--|--|
| Success        | 0000           | Matching is complete – No final Identifier is supplied   | The result is imported to the internal scheduler data base, this is presented to the user and is logged. |
| Refused        | A700           | Out of Resources   | C-Find Responses are not processed, the reason is logged, a failure status is reported to the user.      |
| Failed         | A900           | Identifier does not match SOP Class  | C-Find Responses are not processed, the reason is logged, a failure status is reported to the user.      |
|                | C001           | Unable to process  | C-Find Responses are not processed, the reason is logged, a failure status is reported to the user.      |
| Cancel         | FE00           | Matching terminated due to Cancel request  | C-Find Responses are not processed, the reason is logged, a failure status is reported to the user.      |
| Pending        | FF00           | Matches are continuing – Current match is supported in the same manner as supplied and any optional keys were required keys. | Continues with processing the find responses.  |
|                | FF01           | Matches are continuing – Warning that one or more optional keys were not supported for existence for this identifier.        | Continues with processing the find responses.  |
| *              | Any other code | *  | C-Find Responses are not processed, the reason is logged, a failure status is reported to the user.      |

The behavior of the Worklist AE during communication failure is presented in Table 12.

**Table 12: Communication Failure Behavior for Worklist AE Update Worklist**

| Exception            | Behavior  |
|----------------------|---|
| Timeout              | The association is aborted using A-ABORT. C-Find Responses are not processed, the reason is logged, a failure status is reported to the user. |
| Association aborted  | The association is aborted using A-ABORT. C-Find Responses are not processed, the reason is logged, a failure status is reported to the user. |
| Association rejected | C-Find Responses are not processed, the reason is logged, a failure status is reported to the user.   |

### 4.2.1.3.2 Verify Application Level Communication

#### 4.2.1.3.2.1 Description and Sequencing of Activities

For each Verify Application Level Communication request Worklist AE initiates and association to the remote system and transmits a C-ECHO request. After the response is received the association is closed.

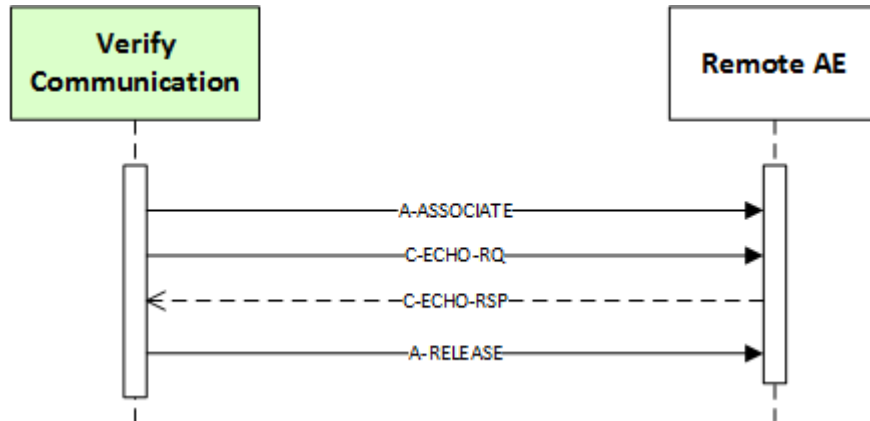


Figure 4:Sequencing of RWA Verify Application Level Communication

#### 4.2.1.3.2.2 Proposed Presentation Contexts

The presentation context proposed by Worklist AE Verify Application Level Communication is defined in Table 13. The implementation will choose ELE transfer syntax in the case multiple transfer syntaxes are accepted by the SCP.

Table 13: Proposed Presentation Contexts for Worklist AE Verify Application Level Communication

| Presentation Context table |                   |                 |  |      |                      |
|----------------------------|-------------------|-----------------|--|------|----------------------|
| Name                       | UID               | Transfer Syntax |  | Role | Extended Negotiation |
|                            |                   | Name List       | UID List                                 |      |                      |
| Verification               | 1.2.840.10008.1.1 | ILE<br>ELE      | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.1 | SCU  | None                 |

#### 4.2.1.3.2.3 SOP Specific Conformance for SOP Classes

The behavior of the Worklist AE for status codes in a Verification response is presented in Table 14.

**Table 14: Response Status Handling Behavior for Worklist AE Verify Application Level Communication**

| Service Status | Error Code     | Further Meaning      | Behavior                            |
|----------------|----------------|----------------------|-------------------------------------|
| Success        | 0000           | Successful operation | The success is reported to the user |
| *              | Any other code | *                    | The failure is reported to the user |

The behavior of the Worklist AE during communication failure is presented in Table 15.

**Table 15: Communication Failure Behavior for Worklist AE Verify Application Level Communication**

| Exception            | Behavior  |
|----------------------|---|
| Timeout              | The reason is logged, a failure status is reported to the user. |
| Association aborted  | The reason is logged, a failure status is reported to the user. |
| Association rejected | The reason is logged, a failure status is reported to the user. |

#### 4.2.1.4 Association Acceptance Policy

Vidan2s Worklist AE does not accept associations.



## 4.2.2 QSTORE AE

### 4.2.2.1 SOP Classes

The Vidan2 Store AE provides Standard Conformance to the following DICOM V3.0 SOP classes as an SCU.

**Table 16: Supported SOP Classes for Store AE**

| SOP Class Name                           | SOP Class UID                    | SCU | SCP |
|--|----------------------------------|-----|-----|
| Verification                             | 1.2.840.10008.1.1                | Yes | No  |
| Ultrasound Multi-Frame Image Storage     | 1.2.840.10008.5.1.4.1.1.3.1      | Yes | No  |
| Ultrasound Image Storage                 | 1.2.840.10008.5.1.4.1.1.6.1      | Yes | No  |
| Visible Light Photographic Image Storage | 1.2.840.10008.5.1.4.1.1.77.1.4   | Yes | No  |
| Video Photographic Image Storage         | 1.2.840.10008.5.1.4.1.1.77.1.4.1 | Yes | No  |

Vidan2 may be configured to use other Image Storage SOP Classes on customer's request.

The conformance statements will be available as addendum when applicable.

The Vidan2 Store AE does not support DICOM V 3.0 SOP Classes as an SCP.

### 4.2.2.2 Association Policies

#### 4.2.2.2.1 General

The DICOM standard application context name for DICOM 2.0 is always proposed as presented in Table 17. The PDU size is configurable from a minimum of 4096 bytes.

**Table 17: DICOM Application Context**

|                          |                       |
|--------------------------|-----------------------|
| Application Context Name | 1.2.840.10008.3.1.1.1 |
|--------------------------|-----------------------|

#### 4.2.2.2.2 Number of Associations

Store AE will establish a maximum of two associations at a time. Based on local activities, one association may perform Application Level Communication Verification, another association may be used for image storage.

**Table 18: Number of Associations as an Association Initiator for Store AE**

|   |   |
|---|---|
| Maximum number of simultaneous associations | 2 |
|---|---|

Store AE will not handle incoming associations.

**Table 19: Number of Associations as an Association Acceptor for Store AE**

|   |      |
|---|------|
| Maximum number of simultaneous associations | N.A. |
|---|------|

#### 4.2.2.2.3 Asynchronous Nature

Store AE does not support asynchronous operations and will not perform asynchronous window negotiation.

**Table 20: Asynchronous Nature as an Association Initiator for Store AE**

|   |      |
|---|------|
| Maximum number of outstanding asynchronous transactions | N.A. |
|---|------|

**4.2.2.2.4 Implementation Identifying Information**

The implementation information for Store AE is:

**Table 21: DICOM Implementation Class and Version for Store AE**

|                             |                          |
|-----------------------------|--------------------------|
| Implementation Class UID    | 2.16.840.1.113669.632.16 |
| Implementation Version Name | QDICNET_3X *             |

\* X identifies the version number.

**4.2.2.3 Association Initiation Policy**

The Store AE initiates associations as a result of the following events:

- The user ends an examination (see 4.2.2.3.1).
- The user initiates an image transfer from Vidan2s local archive (see 4.2.2.3.1)
- The internal timer for cyclic Connectivity Check expires (see 4.2.2.3.2).
- In the service mode, the operator verifies application level communication (see 4.2.2.3.2).

**4.2.2.3.1 Transfer Images**

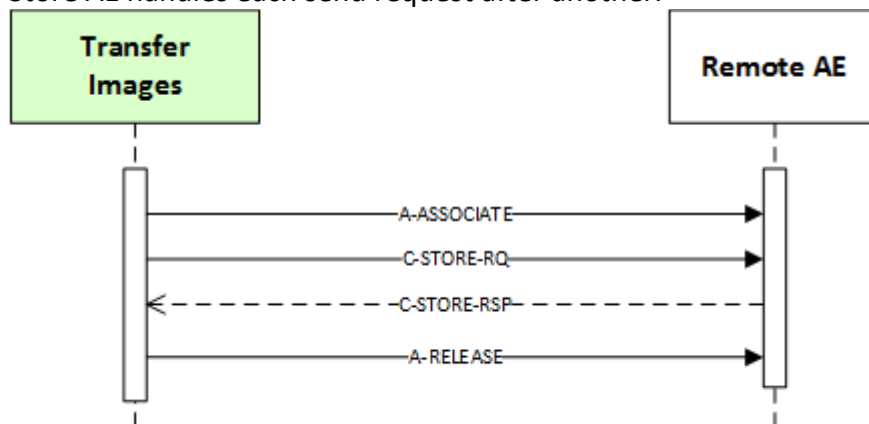
**4.2.2.3.1.1 Description and Sequencing of Activities**

The acquired images will be sent to the configured remote system after the user ends the examination. Studies out of Vidan2s local archive will be sent after the user requests “Save Examination”.

Store AE initiates one association to the configured SCP and uses it to send the images via C-STORE requests. If the examination contains multiple images, then multiple C-STORE requests will be issued within the same association.

The association will be closed after successful transfer of all images or when an error occurs.

Store AE handles each send request after another.



**4.2.2.3.1.2 Proposed Presentation Contexts**

Each time an association is initiated Store AE will propose one or two presentation contexts from the list presented in Table 23.

**4.2.2.3.1.2.1 Abstract Syntax Selection**

The abstract syntax selection criteria are based on the configuration and if acquired images are single frame or multi-frame images. Based on the configured Modality Type Vidan2 will choose an abstract syntax from the table below.

**Table 22: Abstract Syntax based on the configured Modality Type**

| Modality Type | Abstract Syntax single frame             |                                | Abstract Syntax multi frame          |                                  |
|---------------|--|--------------------------------|--------------------------------------|----------------------------------|
|               | Name                                     | UID                            | Name                                 | UID                              |
| XC            | Visible Light Photographic Image Storage | 1.2.840.10008.5.1.4.1.1.77.1.4 | Video Photographic Image Storage     | 1.2.840.10008.5.1.4.1.1.77.1.4.1 |
| US            | Ultrasound Image Storage                 | 1.2.840.10008.5.1.4.1.1.6.1    | Ultrasound Multi-Frame Image Storage | 1.2.840.10008.5.1.4.1.1.3.1      |

For single frame instances the proposed transfer syntax is always Implicit VR Little Endian and Explicit VR Little Endian.

For multi frame instances the proposed transfer syntax is based on the systems multi frame compression configuration (see 4.4.2.1)

Once multi-frame images are compressed they will not be decompressed if the remote AE does not support the presentation context. There will be no “fall back” to the DICOM default transfer syntax.

Presentation contexts for a SOP Class will only be proposed if the transfer job contains instances of these SOP Classes.

**Table 23: Presentation Contexts for QStore AE Transfer Images**

| Abstract Syntax                          |                                  | Transfer Syntax           |                        | Role | Extended Negotiation |
|--|----------------------------------|---------------------------|------------------------|------|----------------------|
| Name                                     | UID                              | Name List                 | UID List               |      |                      |
| Visible Light Photographic Image Storage | 1.2.840.10008.5.1.4.1.1.77.1.4   | Implicit VR Little Endian | 1.2.840.10008.1.2      | SCU  | None                 |
|  |                                  | Explicit VR Little Endian | 1.2.840.10008.1.2.1    |      |                      |
| Video Photographic Image Storage         | 1.2.840.10008.5.1.4.1.1.77.1.4.1 | Implicit VR Little Endian | 1.2.840.10008.1.2      | SCU  | None                 |
|  |                                  | Explicit VR Little Endian | 1.2.840.10008.1.2.1    |      |                      |
|  |                                  | JPEG Baseline (Process 1) | 1.2.840.10008.1.2.4.50 |      |                      |

|                                      |                             |  |                         |     |      |
|--------------------------------------|-----------------------------|--|-------------------------|-----|------|
|                                      |                             | MPEG-4 AVC/H.264 High Profile/Level 4.1                  | 1.2.840.10008.1.2.4.102 |     |      |
|                                      |                             | MPEG-4 AVC/H.264 BD-compatible, High Profile/Level 4.1   | 1.2.840.10008.1.2.4.103 |     |      |
| Ultrasound Image Storage             | 1.2.840.10008.5.1.4.1.1.6.1 | Implicit VR Little Endian                                | 1.2.840.10008.1.2       | SCU | None |
|                                      |                             | Explicit VR Little Endian                                | 1.2.840.10008.1.2.1     |     |      |
| Ultrasound Multi-Frame Image Storage | 1.2.840.10008.5.1.4.1.1.3.1 | Implicit VR Little Endian                                | 1.2.840.10008.1.2       | SCU | None |
|                                      |                             | Explicit VR Little Endian                                | 1.2.840.10008.1.2.1     |     |      |
|                                      |                             | JPEG Baseline (Process 1)                                | 1.2.840.10008.1.2.4.50  |     |      |
|                                      |                             | MPEG-4 AVC/H.264 High Profile/Level 4.1 *                | 1.2.840.10008.1.2.4.102 |     |      |
|                                      |                             | MPEG-4 AVC/H.264 BD-compatible, High Profile/Level 4.1 * | 1.2.840.10008.1.2.4.103 |     |      |

#### 4.2.2.3.1.3 SOP Specific Conformance for Image SOP Classes

All image SOP Classes supported by Store AE exhibit the same behavior. In the case no presentation context for an abstract syntax can be negotiated, instances of this SOP Class will not be sent and the transfer job is marked as failed. The failure is logged and presented to the user via the GUI.

The behavior of Store AE Transfer Images for status codes in a C-STORE response is summarized in Table 24.

**Table 24: Response Status Handling Behavior for QStore AE Transfer Images**

| Service Status | Error Code | Further Meaning                   | Behavior   |
|----------------|------------|-----------------------------------|--|
| Success        | 0000       | Successful operation              | If all SOP instances in a transfer job have status success, then the job is marked completed. The result is logged and reported to the user. |
| Refused        | A700-A7FF  | Out of Resources                  | The association is aborted using A-ABORT and the job is marked as failed. The failure is logged and reported to the user.                    |
| Error          | A900-A9FF  | Data Set does not match SOP Class | The association is aborted using A-ABORT and the job is marked as failed.  |

|         |                       |                                   |  |
|---------|-----------------------|-----------------------------------|--|
|         |                       |                                   | The failure is logged and reported to the user.  |
|         | C001-CFFF             | Cannot understand                 | The association is aborted using A-ABORT and the job is marked as failed.<br>The failure is logged and reported to the user. |
| Warning | B000                  | Coercion of Data Elements         | If all SOP instances in a transfer job have status success, then the job is marked completed.<br>The result is logged.       |
|         | B006                  | Elements discarded                | If all SOP instances in a transfer job have status success, then the job is marked completed.<br>The result is logged.       |
|         | B007                  | Data Set does not match SOP Class | If all SOP instances in a transfer job have status success, then the job is marked completed.<br>The result is logged.       |
| *       | Any other status code | *                                 | The association is aborted using A-ABORT and the job is marked as failed.<br>The failure is logged and reported to the user. |

The behavior of the Store AE during communication failure is presented in Table 25.

**Table 25: Communication Failure Behavior for Store AE Transfer Images**

| Exception            | Behavior   |
|----------------------|--|
| Timeout              | The association is aborted using A-ABORT and the job is marked as failed.<br>The failure is logged and reported to the user. |
| Association aborted  | The association is aborted using A-ABORT and the job is marked as failed.<br>The failure is logged and reported to the user. |
| Association rejected | The job is marked as failed.<br>The failure is logged and reported to the user.  |

#### 4.2.2.3.2 Verify Application Level Communication

##### 4.2.2.3.2.1 Description and Sequencing of Activities

For each Verify Application Level Communication request Store AE initiates and association to the remote system and transmits a C-ECHO request.

After the response is received the association is closed.

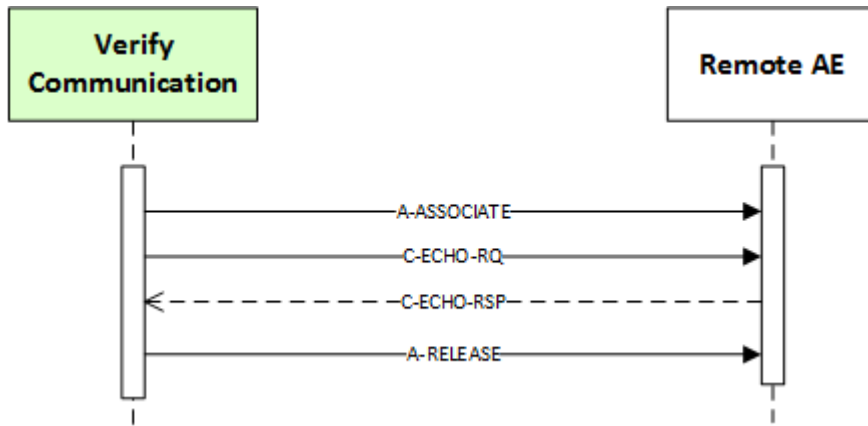


Figure 5: Sequencing of RWA Verify Application Level Communication

**4.2.2.3.2 Proposed Presentation Contexts**

The presentation context proposed by Store AE Verify Application Level Communication is defined in Table 26.

The implementation will choose ELE transfer syntax in the case multiple transfer syntaxes are accepted by the SCP.

**Table 26: Proposed Presentation Contexts for Worklist AE Verify Application Level Communication**

| Presentation Context table |                         |                           |                     |      |                      |
|----------------------------|-------------------------|---------------------------|---------------------|------|----------------------|
| Abstract Syntax            |                         | Transfer Syntax           |                     | Role | Extended Negotiation |
| Name                       | UID                     | Name List                 | UID List            |      |                      |
| Verification               | 1.2.840.10008.5.1.4.1.1 | Implicit VR Little Endian | 1.2.840.10008.1.2   | SCU  | None                 |
|                            |                         | Explicit VR Little Endian | 1.2.840.10008.1.2.1 |      |                      |

**4.2.2.3.3 SOP Specific Conformance for Verification SOP Class**

The behavior of the Store AE for status codes in a Verification response is presented in Table 27.

**Table 27: Response Status Handling Behavior for QStore AE Verify Application Level Communication**

| Service Status | Error Code     | Further Meaning      | Behavior                            |
|----------------|----------------|----------------------|-------------------------------------|
| Success        | 0000           | Successful operation | The success is reported to the user |
| *              | Any other code | *                    | The failure is reported to the user |

The behavior of the Store AE during communication failure is presented in Table 28.

**Table 28: Communication Failure Behavior for Store AE Verify Application Level Communication**

| Exception            | Behavior  |
|----------------------|---|
| Timeout              | The reason is logged, a failure status is reported to the user. |
| Association aborted  | The reason is logged, a failure status is reported to the user. |
| Association rejected | The reason is logged, a failure status is reported to the user. |

#### 4.2.2.4 Association Acceptance Policy

Vidan2 Store AE does not accept associations.

### 4.3 Network Interfaces

#### 4.3.1 Physical Network Interface

The Vidan2 provides DICOM V3.0 TCP/IP Network Communication. The TCP/IP stack is inherited from the Windows operating system.

The Vidan2 supports a single network interface: Ethernet ISO.8802-3. Standard AUI, optional twisted pair 100/1000-BaseT.

#### 4.3.2 Additional Protocols

Additional protocols like DHCP, DNS, NTP may be present in the Windows operating system, its usage is transparent for Vidan2.

### 4.4 Configuration

The Vidan2 Worklist AE and Store AE are configured via the Service / Installation Tool. The Service / Installation Tool is intended to be used by DEKOM Service Engineers only. The configuration is stored in configuration repositories.

#### 4.4.1 AE Title/Presentation Address Mapping

##### 4.4.1.1 Local AE Titles

No default AE Titles are provided; they must be configured during installation. The Application Entities may be configured to use the same local AE Title.

| Application Entity | Default AE Title | Default TCP/IP Port |
|--------------------|------------------|---------------------|
| Worklist AE        | No Default       | N.A.                |
| Store AE           | No Default       | N.A.                |

#### **4.4.1.2 Remote AE Titles/Presentation Address Mapping**

The AE Title, host names / IP addresses and port numbers of remote applications are configured using the Vidan2 Service/Installation Tool.

##### **4.4.1.2.1 Worklist AE**

The AE Title, host name / IP address and port number of the remote Modality Worklist SCP is configured using the Vidan2 Service/Installation Tool.  
Only one remote Modality Worklist SCP can be defined.

##### **4.4.1.2.2 Store AE**

The AE Title, host name / IP address and port number of the remote STORE SCP is configured using the Vidan2 Service/Installation Tool.  
Only one remote STORE SCP can be defined.



#### 4.4.2 Parameters

A large number of parameters related to image acquisition and general operation can be configured using the Vidan2 Service/Installation Tool (see the Vidan2 Service Manual). The following table presents just parameter relevant to the DICOM communication.

**Table 29: Configurable Parameters for Vidan2**

| Parameter  | Configurable (Yes / No) | Default Value       |
|--|-------------------------|---------------------|
| <b>Worklist AE (local System)</b>  |                         |                     |
| AE Title   | Yes                     | No Default          |
| Time-out waiting for an acceptance or rejection to an Association Request(Application Level Timeout) | No                      | 15 s                |
| Time-out waiting for a response to an Association Release Request(Application Level Timeout)         | No                      | 15 s                |
| <b>Worklist AE (Remote System(s))</b>  |                         |                     |
| AE Title   | Yes                     | No Default          |
| IP host name/address   | Yes                     | localhost           |
| Port Number  | Yes                     | 104                 |
| Modality Worklist SCU time-out waiting for a response to the C-FIND_RQ                               | Yes                     | 15 s                |
| Supported Transfer Syntaxes for Modality Worklist  | No                      | ILE /ELE            |
| Query Worklist for specific Scheduled Station AE Title   | Yes                     | No Default          |
| Query Worklist for specific Modality Value   | Yes                     | No Default          |
| <b>Store AE (local System)</b>   |                         |                     |
| AE Title   | Yes                     | No Default          |
| Time-out waiting for an acceptance or rejection to an Association Request(Application Level Timeout) | No                      | 15 s                |
| Time-out waiting for a response to an Association Release Request(Application Level Timeout)         | No                      | 15 s                |
| <b>Store AE (Remote System(s))</b>   |                         |                     |
| AE Title   | Yes                     | No Default          |
| IP host name/address   | Yes                     | No Default          |
| Port Number  | Yes                     | No Default          |
| Time-out waiting for a response to a C-STORE-RQ  | Yes                     | 15 sec              |
| Multiframe Compression configuration: affects supported transfer syntaxes                            | Yes                     | See chapter 4.4.2.1 |
| Delay between automatic Verification Check   | Yes                     | 5 Min               |

##### 4.4.2.1 Multi frame Compression Configuration

Within the Vidan2 configuration the user configures the Video compression type the system shall use for multi frame images:

| User Selection        | Resulting Transfer Syntax |
|-----------------------|---------------------------|
| Uncompressed          | 1.2.840.10008.1.2.1       |
| JPEG Compression      | 1.2.840.10008.1.2.4.50    |
| MPEG-4 Compression    | 1.2.840.10008.1.2.4.102   |
| MPEG-4 BD Compression | 1.2.840.10008.1.2.4.103   |

See also chapter 4.2.2.3.1.2 for more details on Presentation Context selection.

## **5 Media Interchange**

Vidan2 does not support DICOM Media Storage.

## 6 Support of Character Sets

The following character sets are supported by Vidan2s DICOM applications:

ISO\_IR 100 (ISO 8859-1 Latin Alphabet No. 1 supplementary set)

## 7 Security

The DICOM applications of Vidan2 do not support any specific security measures. It is assumed that Vidan2 is used within a secured environment. It is assumed that a secured environment includes at a minimum:

- Firewall or routers protections to ensure that only approved external hosts have network access to Vidan2.
- Firewall or router protections to ensure that Vidan2 only has network access to approved external hosts and services.
- Any communication with external hosts and services outside the locally secured environment use appropriate secure network channels (e.g. such as Virtual Private Network (VPN)).

Other network security procedures such as automated intrusion detection may be appropriate in some environments. Additional security features may be established by the local security policy and are beyond the scope of this conformance statement.

## 8 Annexes

### 8.1 IOD Contents

#### 8.1.1 Created SOP Instances

The chapters contain the lists of DICOM attributes provided by Vidan2s image instances.

The following tables use a number of abbreviations. The abbreviations used in the “Presence of ...” column are listed in Table 30:

**Table 30: Abbreviations used the column “Presence of ...”**

| Abbreviation | Meaning  |
|--------------|--|
| VNAP         | Value Not Always Present (attribute sent zero length if no value is present) |
| ANAP         | Attribute Not Always Present   |
| ALWAYS       | Always Present   |
| NEVER        | Never Present  |
| EMPTY        | Attribute is sent without a value  |

The abbreviations used in the “Source” column are listed in Table 31:

**Table 31: Abbreviations used the column “Source”**

| Abbreviation | Meaning  |
|--------------|--|
| MWL          | The attribute value source is Modality Worklist        |
| USER         | The attribute value source is from User input          |
| AUTO         | The attribute value is generated automatically         |
| CONFIG       | The attribute value source is a configurable parameter |

Note: The created IODs modules and attributes are based on templates. The templates can be adjusted by DEKOM Service engineers on customer’s request. This document describes the defaults.

#### 8.1.1.1 Visible Light Photographic Image IOD

**Table 32: IOD of Created Visible Light Photographic SOP Instances**

| IE        | Module            | Reference | Presence of Module |
|-----------|-------------------|-----------|--------------------|
| Patient   | Patient           | Table 36  | ALWAYS             |
| Study     | General Study     | Table 37  | ALWAYS             |
| Series    | General Series    | Table 38  | ALWAYS             |
| Equipment | General Equipment | Table 39  | ALWAYS             |
| Image     | General Image     | Table 41  | ALWAYS             |

|  |                     |          |   |
|--|---------------------|----------|---|
|  | Image Pixel         | Table 42 | ALWAYS  |
|  | Acquisition Context | Table 50 | ALWAYS  |
|  | Specimen            | -        | NEVER, Vidan2 is not designed to be used for specimen |
|  | VL Image            | Table 51 | ALWAYS  |
|  | SOP Common          | Table 44 | ALWAYS  |

### 8.1.1.2 Video Photographic Image IOD

Table 33: IOD of Created Video Photographic SOP Instances

| IE        | Module              | Reference | Presence of Module  |
|-----------|---------------------|-----------|---|
| Patient   | Patient             | Table 36  | ALWAYS  |
| Study     | General Study       | Table 37  | ALWAYS  |
| Series    | General Series      | Table 38  | ALWAYS  |
| Equipment | General Equipment   | Table 39  | ALWAYS  |
| Image     | General Image       | Table 41  | ALWAYS  |
|           | Cine                | Table 48  | ALWAYS  |
|           | Multi-frame         | Table 49  | ALWAYS  |
|           | Image Pixel         | Table 42  | ALWAYS  |
|           | Acquisition Context | Table 50  | ALWAYS  |
|           | Specimen            | -         | NEVER, Vidan2 is not designed to be used for specimen       |
|           | VL Image            | Table 51  | ALWAYS  |
|           | SOP Common          | Table 44  | ALWAYS  |
|           | Frame Extraction    | -         | NEVER, Vidan2 does not support Frame-Level retrieve request |

### 8.1.1.3 Ultrasound Image IOD

Table 34: IOD of Created Ultrasound Image SOP Instances

| IE        | Module            | Reference | Presence of Module |
|-----------|-------------------|-----------|--------------------|
| Patient   | Patient           | Table 36  | ALWAYS             |
| Study     | General Study     | Table 37  | ALWAYS             |
| Series    | General Series    | Table 38  | ALWAYS             |
| Equipment | General Equipment | Table 39  | ALWAYS             |
| Image     | General Image     | Table 41  | ALWAYS             |

|  |                            |          |        |
|--|----------------------------|----------|--------|
|  | Image Pixel                | Table 42 | ALWAYS |
|  | Contrast/bolus             | -        | NEVER  |
|  | Palette Color Lookup Table | -        | NEVER  |
|  | US Image                   | Table 52 | ALWAYS |
|  | SOP Common                 | Table 44 | ALWAYS |

#### 8.1.1.4 Ultrasound Multi-Frame Image IOD

Table 35: IOD of Created Ultrasound Multi-Frame SOP Instances

| IE                 | Module                     | Reference | Presence of Module |
|--------------------|----------------------------|-----------|--------------------|
| Patient            | Patient                    | Table 36  | ALWAYS             |
| Study              | General Study              | Table 37  | ALWAYS             |
| Series             | General Series             | Table 38  | ALWAYS             |
| Frame Of Reference | Frame of Reference         | -         | NEVER              |
| Equipment          | General Equipment          | Table 39  | ALWAYS             |
| Image              | General Image              | Table 41  | ALWAYS             |
|                    | Image Pixel                | Table 42  | ALWAYS             |
|                    | Contrast/bolus             | -         | NEVER              |
|                    | Cine                       | Table 48  | ALWAYS             |
|                    | Multi-frame                | Table 49  | ALWAYS             |
|                    | Palette Color Lookup Table | -         | NEVER              |
|                    | US Image                   | Table 52  | ALWAYS             |
|                    | SOP Common                 | Table 44  | ALWAYS             |

### 8.1.1.5 Common Modules

**Table 36: Patient Module of created SOP Instances**

| Attribute Name       | Tag       | VR | Value  | Presence of Value | Source                |
|----------------------|-----------|----|--|-------------------|-----------------------|
| Patient's Name       | 0010,0010 | PN | In the case the user selects an „Emergency Patient“, a template based auto generated value is used.<br><br>The „Emergency Patient“ template is configurable. | ALWAYS            | MWL/<br>USER/<br>AUTO |
| Patient ID           | 0010,0020 | LO | In the case the user selects an „Emergency Patient“ a template based unique auto generated value is used   | ALWAYS            | MWL/<br>USER/<br>AUTO |
| Patient's Birth Date | 0010,0030 | DA | <yyyymmdd>   | VNAP              | MWL/<br>USER/<br>AUTO |
| Patient's Sex        | 0010,0040 | CS |  | VNAP              | MWL/<br>USER/<br>AUTO |

**Table 37: General Study Module of created SOP Instances**

| Attribute Name             | Tag       | VR | Value   | Presence of Value | Source                |
|----------------------------|-----------|----|---|-------------------|-----------------------|
| Study Instance UID         | 0020,000D | UI | Taken from MWL or auto generated  | ALWAYS            | MWL/AU<br>TO          |
| Study Date                 | 0008,0020 | DA | <yyyymmdd>  | ALWAYS            | AUTO                  |
| Study Time                 | 0008,0030 | TM | <hhmmss>  | ALWAYS            | AUTO                  |
| Referring Physician's Name | 0008,0090 | PN | Taken from MWL or empty   | VNAP              | MWL                   |
| Study ID                   | 0020,0010 | SH | Taken from MWL or empty   | VNAP              | MWL                   |
| Accession Number           | 0010,0020 | SH | In the case the user selects an „Emergency Patient“ a template based auto generated value is used | ALWAYS            | MWL/<br>USER/<br>AUTO |
| Study Description          | 0008,1030 | LO | Taken from MWL or empty   | VNAP              | MWL                   |

**Table 38: General Series Module of created SOP Instances**

| Attribute Name | Tag       | VR | Value   | Presence of Value | Source                |
|----------------|-----------|----|---|-------------------|-----------------------|
| Modality       | 0008,0060 | CS | Taken from MWL or user selection. In the case the user selects an „Emergency Patient“ does not select a | ALWAYS            | MWL/<br>USER/<br>AUTO |



|                     |           |    |   |        |      |
|---------------------|-----------|----|---|--------|------|
|                     |           |    | modality, the first configured Modality is used |        |      |
| Series Instance UID | 0020,000E | UI |   | ALWAYS | AUTO |
| Series Number       | 0020,0011 | IS |   | ALWAYS | AUTO |
| Series Date         | 0008,0021 | DA | <yyyymmdd>                                      | ALWAYS | AUTO |
| Series Time         | 0008,0031 | TM | <hhmmss>  | ALWAYS | AUTO |

**Table 39: General Equipment Module (Type 1) of created SOP Instances**

| Attribute Name            | Tag       | VR | Value                    | Presence of Value | Source |
|---------------------------|-----------|----|--------------------------|-------------------|--------|
| Manufacturer              | 0008,0070 | LO | DEKOM - Engineering GmbH | ALWAYS            | AUTO   |
| Institution Name          | 0008,0080 | LO |                          | ALWAYS            | CONFIG |
| Institution Address       | 0008,0081 | ST |                          | ALWAYS            | CONFIG |
| Manufacturer's Model Name | 0008,1090 | LO | Vidan2                   | ALWAYS            | AUTO   |
| Device Serial Number      | 0018,1000 | LO |                          | ALWAYS            | AUTO   |
| Software Versions         | 0018,1020 | LO |                          | ALWAYS            | AUTO   |

**Table 40: General Equipment Module (Type 2) of created SOP Instances**

| Attribute Name      | Tag       | VR | Value | Presence of Value | Source |
|---------------------|-----------|----|-------|-------------------|--------|
| Institution Name    | 0008,0080 | LO |       | ALWAYS            | CONFIG |
| Institution Address | 0008,0081 | ST |       | ALWAYS            | CONFIG |

**Table 41: General Image Module of created SOP Instances**

| Attribute Name          | Tag       | VR | Value                                  | Presence of Value | Source |
|-------------------------|-----------|----|--|-------------------|--------|
| Instance Number         | 0020,0013 | IS |  | ALWAYS            | AUTO   |
| Image Type              | 0008,0008 | CS | Value 1: ORIGINAL<br>Value 2: PRIMARY  | ALWAYS            | AUTO   |
| Acquisition Date        | 0008,0022 | DA | <yyyymmdd>                             | ALWAYS            | AUTO   |
| Acquisition Time        | 0008,0032 | TM | <hhmmss>                               | ALWAYS            | AUTO   |
| Lossy Image Compression | 0028,2110 | CS | Dependent on the Transfer Syntax used. | ALWAYS            | AUTO   |

**Table 42: Image Pixel Module (Color) of created SOP Instances**

| Attribute Name             | Tag       | VR | Value   | Presence of Value | Source |
|----------------------------|-----------|----|---|-------------------|--------|
| Samples per Pixel          | 0028,0002 | US | 3   | ALWAYS            | AUTO   |
| Photometric Interpretation | 0028,0004 | CS | Uncompressed and JPEG compression: RGB<br>MPEG compression: YBR_PARTIAL_420 | ALWAYS            | AUTO   |
| Rows                       | 0028,0010 | US |   | ALWAYS            | AUTO   |
| Columns                    | 0028,0011 | US |   | ALWAYS            | AUTO   |
| Bits Allocated             | 0028,0100 | US | 8   | ALWAYS            | AUTO   |
| Bits Stored                | 0028,0101 | US | 8   | ALWAYS            | AUTO   |
| High Bit                   | 0028,0102 | US | 7   | ALWAYS            | AUTO   |
| Pixel Representation       | 0028,0103 | US | 0   | ALWAYS            | AUTO   |
| Planar Configuration       | 0028,0006 | US | 0   | ALWAYS            | AUTO   |
| Pixel Data                 | 7FE0,0010 | OB |   | ALWAYS            | AUTO   |

**Table 43: VOI LUT Module of created SOP Instances**

| Attribute Name | Tag       | VR | Value | Presence of Value | Source |
|----------------|-----------|----|-------|-------------------|--------|
| Window Center  | 0028,1050 | DS | 128   | ALWAYS            | AUTO   |
| Window Width   | 0028,1051 | DS | 256   | ALWAYS            | AUTO   |

**Table 44: SOP Common Module of created SOP Instances**

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

**Table 45: SC Image Module of created SOP Instances**

| Attribute Name | Tag | VR | Value                               | Presence of Value | Source |
|----------------|-----|----|-------------------------------------|-------------------|--------|
|                |     |    | No attribute of this module is used | NEVER             |        |

**Table 46: SC Multi-Frame Image Module (Color) of created SOP Instances**

| Attribute Name          | Tag       | VR | Value  | Presence of Value | Source |
|-------------------------|-----------|----|--|-------------------|--------|
| Burned In Annotation    | 0028,0301 | CS | Yes or No based on config                    | ALWAYS            | CONFIG |
| Frame Increment Pointer | 0028,0009 | AT | If No Of Frames > 1<br>Points to (0018,1063) | ANAP              | AUTO   |

**Table 47: SC Multi-Frame Vector Module of created SOP Instances**

| Attribute Name    | Tag       | VR | Value   | Presence of Value | Source |
|-------------------|-----------|----|---|-------------------|--------|
| Frame Time Vector | 0018,1065 | DS | Frame Increment Pointer never points to (0018,1065)<br>Therefore, this tag is not used. | NEVER             |        |

**Table 48: Cine Module of created SOP Instances**

| Attribute Name | Tag       | VR | Value | Presence of Value | Source |
|----------------|-----------|----|-------|-------------------|--------|
| Frame Time     | 0018,1063 | DS |       | ALWAYS            | AUTO   |

**Table 49: Multi-Frame Module of created SOP Instances**

| Attribute Name          | Tag       | VR | Value     | Presence of Value | Source |
|-------------------------|-----------|----|-----------|-------------------|--------|
| Number Of Frames        | 0028,0008 | IS |           | ALWAYS            | AUTO   |
| Frame Increment Pointer | 0028,0009 | AT | 0018,1063 | ALWAYS            | AUTO   |

**Table 50: Acquisition Context Module of created SOP Instances**

| Attribute Name               | Tag       | VR | Value          | Presence of Value | Source |
|------------------------------|-----------|----|----------------|-------------------|--------|
| Acquisition Context Sequence | 0040,0555 | SQ | Empty Sequence | EMPTY             | AUTO   |

**Table 51: VL Image Module of created SOP Instances**

| Attribute Name             | Tag       | VR | Value                                  | Presence of Value | Source        |
|----------------------------|-----------|----|--|-------------------|---------------|
| Image Type                 | 0008,0008 | CS | Value 1: ORIGINAL<br>Value 2: PRIMARY  | ALWAYS            | AUTO          |
| Photometric Interpretation | 0028,0004 | CS | RGB                                    | ALWAYS            | AUTO          |
| Bits Allocated             | 0028,0100 | US | 8                                      | ALWAYS            | AUTO          |
| Bits Stored                | 0028,0101 | US | 8                                      | ALWAYS            | AUTO          |
| High Bit                   | 0028,0102 | US | 7                                      | ALWAYS            | AUTO          |
| Pixel Representation       | 0028,0103 | US | 0                                      | ALWAYS            | AUTO          |
| Samples per Pixel          | 0028,0002 | US | 3                                      | ALWAYS            | AUTO          |
| Planar Configuration       | 0028,0006 | US | 0                                      | ALWAYS            | AUTO          |
| Lossy Image Compression    | 0028,2110 | CS | Dependent on the Transfer Syntax used. | ALWAYS            | AUTO          |
| Anatomic Region Sequence   | 0008,2218 | SQ | See note**                             | ANAP              | MWL/USER/AUTO |

|                           |           |    |  |  |  |
|---------------------------|-----------|----|--|--|--|
| >Code Value               | 0008,0100 | SH |  |  |  |
| >Coding Scheme Designator | 0008,0102 | SH |  |  |  |
| >Code Meaning             | 0008,0104 | LO |  |  |  |

\*NOTE: values given in the VL Image Module Table override related entries in the General Image Module, Image Pixel Module and VOI Module.

\*\*Anatomic Region Sequence behaviour:

The Anatomic Region Sequence is present in the Video Endoscopic Image IOD only. If the DICOM Worklist Procedure Code can be mapped to an Anatomic Region as proposed in DICOM part 16, Annex I, the appropriate CID 4040 Code is taken.

When the Procedure Code cannot be mapped AND no user input is present the following Anatomic Region Sequence is taken (because an entry is required):

|                          |           |            |
|--------------------------|-----------|------------|
| Code Value               | 0008,0100 | D-0000     |
| Coding Scheme Designator | 0008,0102 | 99DEKOM-VL |
| Code Meaning             | 0008,0104 | Unknown    |

**Table 52: US Image Module of created SOP Instances**

| Attribute Name             | Tag       | VR | Value                                  | Presence of Value | Source |
|----------------------------|-----------|----|--|-------------------|--------|
| Samples per Pixel          | 0028,0002 | US | 3                                      | ALWAYS            | AUTO   |
| Photometric Interpretation | 0028,0004 | CS | RGB                                    | ALWAYS            | AUTO   |
| Bits Allocated             | 0028,0100 | US | 8                                      | ALWAYS            | AUTO   |
| Bits Stored                | 0028,0101 | US | 8                                      | ALWAYS            | AUTO   |
| High Bit                   | 0028,0102 | US | 7                                      | ALWAYS            | AUTO   |
| Planar Configuration       | 0028,0006 | US | 0                                      | ALWAYS            | AUTO   |
| Pixel Representation       | 0028,0103 | US | 0                                      | ALWAYS            | AUTO   |
| Frame Increment Pointer    | 0028,0009 | AT | If Number of Frames set Then 0018,1063 | ANAP              | AUTO   |
| Image Type                 | 0008,0008 | CS | Value 1: ORIGINAL<br>Value 2: PRIMARY  | ALWAYS            | AUTO   |
| Lossy Image Compression    | 0028,2110 | CS | Dependent on the Transfer Syntax used. | ALWAYS            | AUTO   |

\*NOTE: values given in the US Image Module Table override related entries in the General Image Module, Image Pixel Module and VOI Module.

### 8.1.2 Used Fields in received IODs

Vidan2s STORE AE does not receive SOP Instances.

The usage of attributes received by Worklist AE is described in chapter 4.2.1.3.1.3.

### 8.1.3 Attribute Mapping

NOTE:

The Attribute Mapping can be changed by Service Engineers using the Service Configuration Tool! The following mapping tables define the default mapping only. The relationships between attributes received by Worklist AE and attributes in the image IOD is described in Table 53.

**Table 53: Attribute Mapping between Modality Worklist and Image IOD**

| Modality Worklist                    | Image IOD                  |
|--------------------------------------|----------------------------|
| Patient's Name                       | Patient's Name             |
| Patient ID                           | Patient ID                 |
| Patient's Birth Date                 | Patient's Birth Date       |
| Patient's Sex                        | Patient's Sex              |
| Referring Physician's Name           | Referring Physician's Name |
| Study Instance UID                   | Study Instance UID         |
| Accession Number                     | Accession Number           |
| Study ID                             | Study ID                   |
| Scheduled Procedure Step Description | Study Description          |

### 8.1.4 Coerced/Modified Fields

The Worklist AE and Query AE will truncate attribute values received in the response to a modality worklist or Study Root query if the value is longer than the maximum length permitted by the destination attribute's VR.

## 8.2 Data Dictionary of Private Attributes

No Private Attributes are supported.

## 8.3 Coded Terminology and Templates

N.A.

## 8.4 Grayscale Image consistency

N.A.

## 8.5 Standard Extended / Specialized / Private SOP Classes

No Extended, Specialized or Private SOP Classes are supported.

## 8.6 Private Transfer Syntaxes

No Private Transfer Syntaxes are supported.