

# **AGFA HEALTHCARE**

## **DICOM Conformance Statement**

→ **IMPAX RIS 6.3.x**

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## Document Information

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## Conformance Statement Overview

IMPAX RIS DICOMserver is the imaging device connectivity service of Agfa's RIS system and acts as a Modality Worklist Management Service Class Provider and a Modality Performed Procedure Step Manager.

IMPAX RIS DICOMserver is only installed when MPPS is required or when there's no Agfa PACS, otherwise the worklists are provided by Connectivity Manager or Enterprise Imaging.

Custom worklists can be configured per modality.

Modality performed procedure step information is only used to update procedure statuses and to store radiation dose information in the RIS.

Image Availability Notification is used to update availability status of the images in RIS database.

**Table 1.1-1: Network Services Supported**

| SOP Classes                                | User of Service (SCU) | Provider of Service (SCP) |
|--------------------------------------------|-----------------------|---------------------------|
| Transfer                                   | No                    | No                        |
| Query/Retrieve                             | No                    | No                        |
| Workflow Management                        |                       |                           |
| Modality Worklist Information Model – FIND | No                    | Yes                       |
| Modality Performed Procedure Step          | Yes                   | Yes                       |
| Instance Availability Notification         | No                    | Yes                       |
| Print Management                           | No                    | No                        |

**Table 1.1-2: Media Services Supported**

| Media Storage Application Profile | Write Files (FSC or FSU) | Read Files (FSR) |
|-----------------------------------|--------------------------|------------------|
| Compact Disk - Recordable         | No                       | No               |
| Magneto-Optical Disk              | No                       | No               |
| DVD                               | No                       | No               |

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# 1 INTRODUCTION

## 1.1 Revision Record

| Revision Number | Date               | Reason for Change                                                                             |
|-----------------|--------------------|-----------------------------------------------------------------------------------------------|
| 2               | March 16, 2017     | Initial version + add Livelink NodeID                                                         |
| 3               | September 27, 2017 | Update document title to IMPAX RIS 6.3.x as the document is valid for version 6.3.0 and 6.3.1 |
| 4               | October 4, 2017    | Update Conformance Statement Overview                                                         |

## 1.2 Purpose and Intended Audience of this Document

This document is a DICOM Conformance Statement for the DICOM Services of the IMPAX RIS 6.3.x product.

The user of this document is involved with system integration and/or software design. We assume that the reader is familiar with the terminology and concepts that are used in the DICOM 3.0 standard and the IHE Technical Framework.

Readers not familiar with DICOM 3.0 terminology should first read the appropriate parts of the DICOM standard itself, prior to reading this conformance statement.

Although the use of this conformance statement in conjunction with the DICOM 3.0 standard is intended to facilitate communication with Agfa IMPAX RIS, it is not sufficient to guarantee, by itself, the inter-operation of the connection. The following issues need to be considered:

## 1.3 General Remarks

IMPAX RIS DICOMserver is part of the 6.3.x Connectivity Suite.

### 1.3.1 Integration and Validation Activities

The integration of any device into a system of interconnected devices goes beyond the scope of the DICOM 3.0 standard and this conformance statement when *interoperability* is desired. The responsibility for analyzing the applications requirements and developing a solution that integrates the Agfa equipment with other vendors' systems is the user's responsibility and should not be underestimated.

In some circumstances it might be necessary to perform a validation to make sure that functional interoperability between the Agfa equipment and non-Agfa devices works as expected. The user should ensure that any non-Agfa provider accepts responsibility for any validation required for their connection with the Agfa equipment.

### 1.3.2 Future Evolution

As the DICOM 3.0 standard evolves to meet the user's growing requirements and to incorporate new features and technologies, Agfa will follow the evolution of the standard. This evolution of the standard may require changes to devices that have implemented DICOM 3.0. The user should ensure that any non-Agfa provider, who connects with Agfa devices, also plans for future evolution of the DICOM standard. A refusal to do so may result in the loss of functionality and/or connectivity between the different products.

## 1.4 Acronyms and Abbreviations

Definitions, terms and abbreviations used in this document are defined within the different parts of the DICOM standard. Abbreviations and terms are as follows:

|       |                                                |
|-------|------------------------------------------------|
| AE    | DICOM Application Entity                       |
| AET   | Application Entity Title                       |
| DICOM | Digital Imaging and Communications in Medicine |
| FSC   | File-Set Creator                               |
| FSU   | File-Set Updater                               |
| FSR   | File-Set Reader                                |
| IAN   | Instance Availability Notification             |
| IE    | Information Entity                             |
| IOD   | (DICOM) Information Object Definition          |
| ISO   | International Standard Organization            |
| MPPS  | Modality Performed Procedure Step              |
| MSPS  | Modality Scheduled Procedure Step              |
| PDU   | DICOM Protocol Data Unit                       |
| SCU   | DICOM Service Class User (DICOM client)        |
| SCP   | DICOM Service Class Provider (DICOM server)    |
| SOP   | DICOM Service-Object Pair                      |
| UID   | Unique Identifier                              |
| VR    | Value Representation                           |

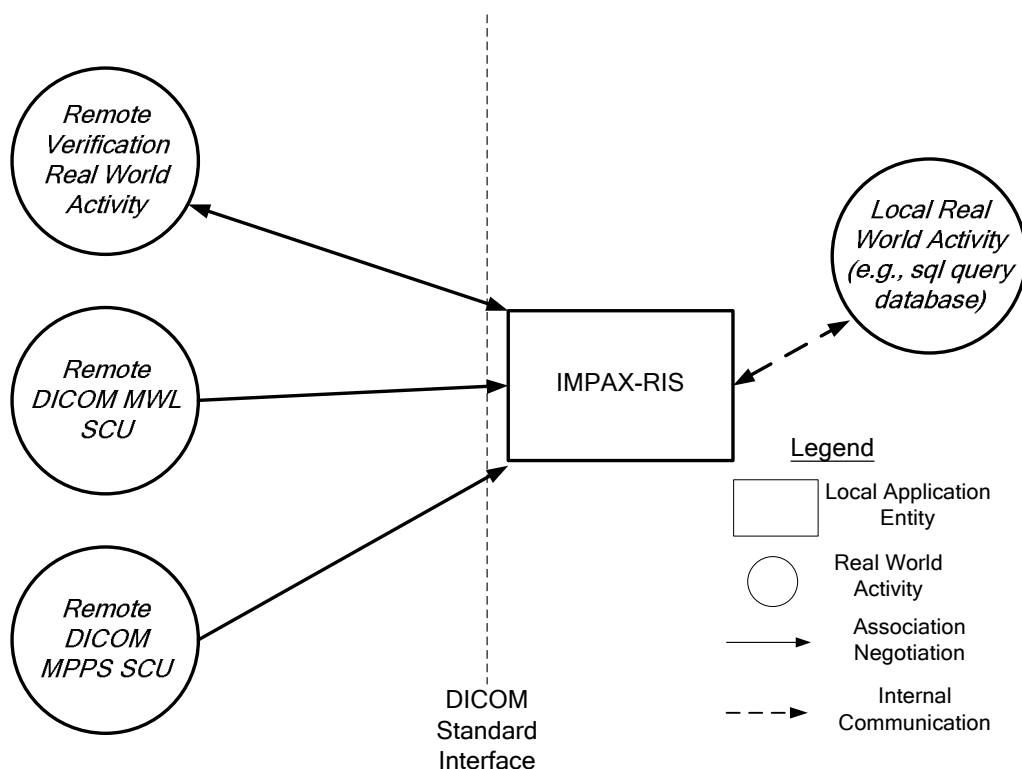
## 1.5 Related Documents

- ACR-NEMA Digital Imaging and Communications in Medicine (DICOM) V3.0.
- IHE Radiology Technical Framework Revision 16.0 – Final Text, August 2017

## 2 NETWORKING

### 2.1 Implementation Model

#### 2.1.1 Application Data Flow Diagram



**Figure 2.1-1: Functional Overview – Application Data Flow**

- The DICOM Query is translated into an SQL Query which is executed on the RIS database. The result of the query is translated into a DICOM response.
- The DICOM instance availability is used to track image availability in the RIS database.
- The DICOM MPPS is used to update the procedure status in the RIS database.

#### 2.1.2 Functional Definitions of AE's

##### 2.1.2.1 Functional Capability of C-FIND Modality Worklist.

IMPAX RIS DICOMserver will accept requests to C-FIND a modality work list. These modality work lists are queried from the database through an SQL interface.



## 2.1.3 Functional Capability of N-CREATE and N-SET Modality Performed Procedure Step.

IMPAX RIS DICOMserver accepts N-CREATE and N-SET Modality Performed Procedure Steps. The IMPAX RIS DICOMserver updates the procedure status in the IMPAX RIS database.

### 2.1.3.1 Functional Capability of N-CREATE Instance Availability Notification.

IMPAX RIS DICOMserver accepts N-CREATE Instance Availability Notifications and updates image availability status in the RIS database.

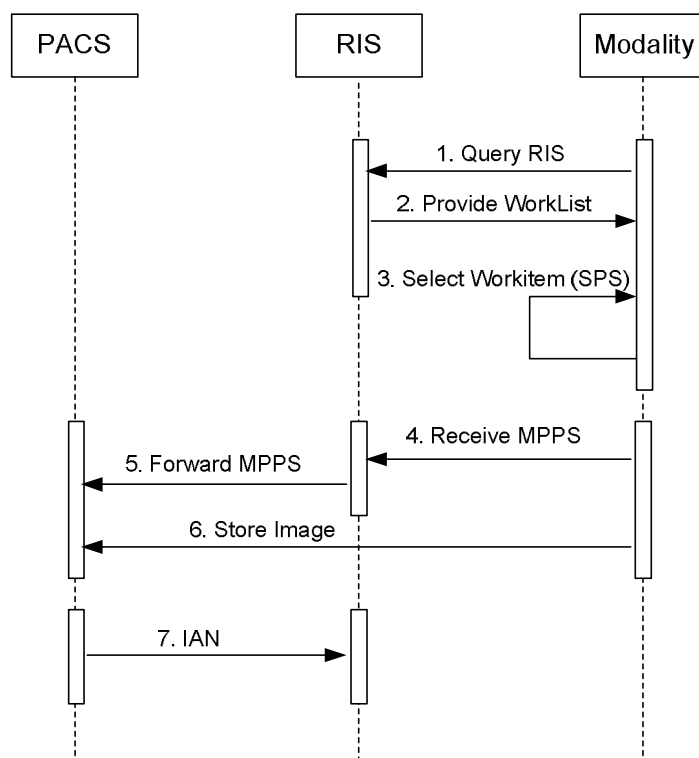
## 2.1.4 Sequencing of Real World Activities

IMPAX RIS DICOMserver must have an installed/working connection with the IMPAX RIS database and with one or more suitable SCU.

Query information is formed on the SCU and then sent to IMPAX RIS DICOMserver. The requesting device must have the DICOM parameters set and configured prior to using the modality's query facilities. The set and configuration of DICOM Modality Worklist SCUs is done using the tools provided by the device's vendor.

As a result of the request IMPAX RIS DICOMserver queries the RIS database and sends a list of tasks that have been scheduled for the requesting modality out of which the device's operator can select the item which is to be performed in reality.

If IMPAX RIS DICOMserver receives an N-CREATE, at the start of the imaging, or an N-SET, at the end of the imaging, it updates the procedure status in the RIS database.



**Figure 2.1-2: sequencing constraints**

## 2.2 AE Specifications

### 2.2.1 IMPAX-RIS DMWL AE Specification

#### 2.2.1.1 SOP Classes Supported

This Application Entity provides Standard Conformance to the following SOP Class(es):

**Table 2.2-1: SOP Class(es)**

| SOP Class Name                             | SOP Class UID          | SCU | SCP |
|--------------------------------------------|------------------------|-----|-----|
| <b>Workflow Management</b>                 |                        |     |     |
| Modality Worklist Information Model - FIND | 1.2.840.10008.5.1.4.31 | No  | Yes |
| Instance Availability Notification         | 1.2.840.10008.5.1.4.33 | No  | Yes |

#### 2.2.1.2 Association Establishment Policies

##### 2.2.1.2.1 General

The DICOM standard Application context shall be specified.

**Table 2.2-2: DICOM Application Context**

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

##### 2.2.1.2.2 Number of Associations

**Table 2.2-3: Number of Associations as an Association Initiator**

|                                                       |   |
|-------------------------------------------------------|---|
| Maximum number of simultaneous associations initiated | 1 |
|-------------------------------------------------------|---|

**Table 2.2-4: Number of Associations as an Association Acceptor**

|                                                      |    |
|------------------------------------------------------|----|
| Maximum number of simultaneous associations accepted | 32 |
|------------------------------------------------------|----|

##### 2.2.1.2.3 Asynchronous Nature

**Table 2.2-5: Asynchronous Nature as an Association Initiator**

|                                                         |   |
|---------------------------------------------------------|---|
| Maximum number of outstanding asynchronous transactions | X |
|---------------------------------------------------------|---|

IMPAX RIS DMWL DICOMserver allows a single outstanding operation on any association. Therefore, IMPAX RIS DMWL DICOMserver does not support asynchronous operations window negotiation, other than the default as specified by the DICOM specification.

## 2.2.1.2.4 Implementation Identifying Information

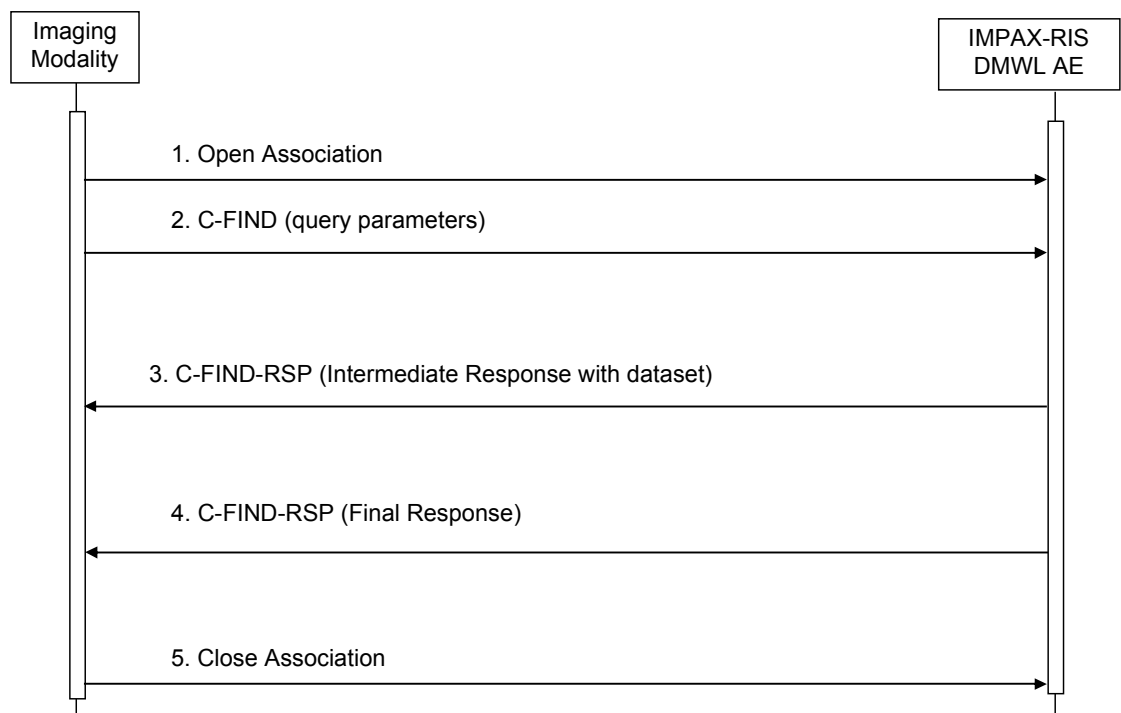
**Table 2.2-6: DICOM implementation Class and Version**

|                             |                |
|-----------------------------|----------------|
| Implementation Class UID    | 1.3.51.0.1.3   |
| Implementation Version Name | AGFA DTF1.0.64 |

## 2.2.1.3 Association Acceptance Policies

### 2.2.1.3.1 Receive Query for Modality Worklist

#### 2.2.1.3.1.1 Description and Sequencing of Activity



**Figure 2.2-1: IMPAX-RIS DMWL Sequencing Diagram**

### 2.2.1.3.1.2 Accepted Presentation Contexts

**Table 2.2-7: Presentation Contexts**

| 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 | Implicit VR Little Endian | 1.2.840.10008.1.2   | SCP  | None                 |
|                                            |                        | Explicit VR Little Endian | 1.2.840.10008.1.2.1 |      |                      |

### 2.2.1.3.1.3 SOP Specific Conformance for Modality Worklist SOP Class

IMPAX RIS DMWL DICOMserver supports all required matching key types:

**Table 2.2-8: Matching Key Types**

| Matching Key Types |                     |
|--------------------|---------------------|
| SV                 | single valued match |
| WC                 | wild card match     |
| SQ                 | sequence match      |
| DR                 | date range match    |

IMPAX RIS DMWL DICOMserver accepts the following elements and applies the following matching for this SOP class:

**Table 2.2-9: DMWL DICOMserver Elements and matching**

| Module                   | Attribute Name                       | Tag         | Match | Return |
|--------------------------|--------------------------------------|-------------|-------|--------|
| Scheduled Procedure Step | Scheduled Procedure Step Sequence    | (0040,0100) |       | 1      |
|                          | >Scheduled Station AE Title          | (0040,0001) | SV    | 1      |
|                          | >Scheduled Procedure Step Start Date | (0040,0002) | DR    | 1      |
|                          | >Modality                            | (0008,0060) | SV    | 1      |
| Requested Procedure      | Requested Procedure ID               | (0040,1001) | SV    | 1      |
| Imaging Service Request  | Accession Number                     | (0008,0050) | SV    | 2      |
| Patient Identification   | Patient Name                         | (0010,0010) | WC    | 1      |
|                          | Patient ID                           | (0010,0020) | SV    | 1      |

IMPAX RIS DMWL DICOMserver supports the following elements in the response:

**Table 2.2-10: DMWL DICOMserver Supported elements**

| Module                   | Attribute Name                    | Tag         | Return            |
|--------------------------|-----------------------------------|-------------|-------------------|
| SOP Common               | Specific Character Set            | (0008,0005) | SV                |
|                          | Query/Retrieve Level              | (0008,0052) | Zero length       |
| Scheduled Procedure Step | Scheduled Procedure Step Sequence | (0040,0100) | SQ                |
|                          | >Scheduled Station AE Title       | (0040,0001) | SV or Zero length |

| Module                  | Attribute Name                                | Tag         | Return            |
|-------------------------|-----------------------------------------------|-------------|-------------------|
|                         | >Scheduled Procedure Step Start Date          | (0040,0002) | SV or Zero length |
|                         | >Scheduled Procedure Step Start Time          | (0040,0003) | SV or Zero length |
|                         | >Scheduled Procedure Stop End Date            | (0040,0004) | SV or Zero length |
|                         | >Scheduled Procedure Stop End Time            | (0040,0005) | SV or Zero length |
|                         | >Modality                                     | (0008,0060) | SV or Zero length |
|                         | >Scheduled Performing Physician               | (0040,0006) | SV or Zero length |
|                         | >Scheduled Procedure Step Desc.               | (0040,0007) | SV or Zero length |
|                         | >Scheduled Station Name                       | (0040,0010) | SV or Zero length |
|                         | >Scheduled Procedure Step Location            | (0040,0011) | SV or Zero length |
|                         | >Scheduled Action Item Code Seq.              | (0040,0008) | SQ                |
|                         | >>Code Value                                  | (0008,0100) | SV or Zero length |
|                         | >>Coding Scheme Designator                    | (0008,0102) | SV or Zero length |
|                         | >>Code Meaning                                | (0008,0104) | SV or Zero length |
|                         | >Pre-Medication                               | (0040,0012) | Zero length       |
|                         | >Scheduled Procedure Step ID                  | (0040,0009) | SV or Zero length |
|                         | >Requested Contrast Agent                     | (0032,1070) | Zero length       |
|                         | >Scheduled Procedure Step Status              | (0040,0020) | SV or Zero length |
|                         | >Comments on the Scheduled Procedure Step     | (0040,0400) | Zero length       |
| Requested Procedure     | Requested Procedure ID                        | (0040,1001) | SV or Zero length |
|                         | Requested Procedure Description               | (0032,1060) | SV or Zero length |
|                         | Reason for Requested Procedure                | (0040,1002) | Zero length       |
|                         | Requested Procedure Code Sequence             | (0032,1064) | SQ                |
|                         | >Code Value                                   | (0008,0100) | SV or Zero length |
|                         | >Coding Scheme Designator                     | (0008,0102) | SV or Zero length |
|                         | >Code Meaning                                 | (0008,0104) | SV or Zero length |
|                         | Study Instance UID                            | (0020,000D) | SV or Zero length |
|                         | Referenced Study Sequence                     | (0008,1110) | Zero length       |
|                         | >Referenced SOP Class UID                     | (0008,1150) | SV                |
|                         | >Referenced SOP Instance UID                  | (0008,1155) | SV                |
|                         | Requested Procedure Priority                  | (0040,1003) | SV or Zero length |
|                         | Patient Transport Arrangements                | (0040,1004) | Zero length       |
|                         | Requested Procedure Location                  | (0040,1005) | Zero length       |
|                         | Requested Procedure Comments                  | (0040,1400) | SV or Zero length |
|                         | Confidentiality Code                          | (0040,1008) | Zero length       |
|                         | Reporting Priority                            | (0040,1009) | Zero length       |
|                         | Names of Intended Recipients of Results       | (0040,1010) | Zero length       |
| Imaging Service Request | Accession Number                              | (0008,0050) | SV or Zero length |
|                         | Imaging Service Request Comments              | (0040,2400) | SV or Zero length |
|                         | Requesting Physician                          | (0032,1032) | SV or Zero length |
|                         | Requesting Service                            | (0032,1033) | SV or Zero length |
|                         | Referring Physician Name                      | (0008,0090) | SV or Zero length |
|                         | Issue Date of Imaging Service Request         | (0040,2004) | Zero length       |
|                         | Issue Time of Imaging Service Request         | (0040,2005) | Zero length       |
|                         | Placer Order Number / Imaging Service Request | (0040,2016) | Zero length       |
|                         | Filler Order Number / Imaging Service Request | (0040,2017) | SV or Zero length |
|                         | Reason for Imaging Service Request            | (0040,2001) | Zero length       |
|                         | Order Entered by ...                          | (0040,2008) | Zero length       |
|                         | Order Enterer's Location                      | (0040,2009) | Zero length       |

| Module                 | Attribute Name                  | Tag         | Return            |
|------------------------|---------------------------------|-------------|-------------------|
|                        | Order Callback Phone Number     | (0040,2010) | Zero length       |
| Visit Identification   | Admission ID                    | (0038,0010) | SV or Zero length |
|                        | Issuer of Admission ID          | (0038,0011) | Zero length       |
|                        | Institution Name                | (0008,0080) | Zero length       |
|                        | Institution Address             | (0008,0081) | Zero length       |
| Visit Status           | Current Patient Location        | (0038,0300) | SV or Zero length |
| Visit Relationship     | Referenced Patient Sequence     | (0008,1120) | Zero length       |
|                        | >Referenced SOP Class UID       | (0008,1150) | Zero length       |
|                        | >Referenced SOP Instance UID    | (0008,1155) | Zero length       |
| Visit Admission        | Admitting Diagnosis Description | (0008,1080) | Zero length       |
| Patient Identification | Patient Name                    | (0010,0010) | SV or Zero length |
|                        | Patient ID                      | (0010,0020) | SV or Zero length |
|                        | Issuer of Patient ID            | (0010,0021) | SV or Zero length |
|                        | Ethnic Group                    | (0010,2160) | Zero length       |
|                        | Other Patient ID                | (0010,1000) | Zero length       |
|                        | Other Patient Name              | (0010,1001) | Zero length       |
|                        | Patient Address                 | (0010,1040) | SV or Zero length |
| Patient Demographic    | Patient Birth Date              | (0010,0030) | SV or Zero length |
|                        | Patient Sex                     | (0010,0040) | SV or Zero length |
|                        | Patient Weight                  | (0010,1030) | Zero length       |
|                        | Patient's Size                  | (0010,1020) | Zero length       |
|                        | Confidentiality Constraint      | (0040,3001) | Zero length       |
|                        | Region of Residence             | (0010,2152) | Zero length       |
|                        | Military Rank                   | (0010,1080) | Zero length       |
|                        | Patient Comments                | (0010,4000) | Zero length       |
| Patient Medical        | Patient State                   | (0038,0500) | Zero length       |
|                        | Smoking Status                  | (0010,21A0) | Zero length       |
|                        | Additional Patient History      | (0010,21B0) | Zero length       |
|                        | Pregnancy Status                | (0010,21C0) | Zero length       |
|                        | Last Menstrual Date             | (0010,21D0) | Zero length       |
|                        | Medical Alerts                  | (0010,2000) | Zero length       |
|                        | Contrast Allergies              | (0010,2110) | Zero length       |
|                        | Special Needs                   | (0038,0050) | Zero length       |

Table 2.2-11: IMPAX RIS DMWL DICOMserver Response Status

| Service Status | Further Meaning      | Error Code | Reason                                                  |
|----------------|----------------------|------------|---------------------------------------------------------|
| Success        | Success              | 0000       | Operation performed properly, all matches were returned |
| Error          | Processing Failure   | C000       | No access to RIS database                               |
| Pending        | More matches to come | FF00       | This status is returned with each matching response     |

### 2.2.1.3.2 Receive Instance Availability Notification



**Figure 2.2-2: Instance Availability Notification Sequencing Diagram**

#### 2.2.1.3.2.1 Accepted Presentation Contexts

**Table 2.2-12: Presentation Contexts Proposed**

| Presentation Context Table         |                        |                           |                     |      |                      |
|------------------------------------|------------------------|---------------------------|---------------------|------|----------------------|
| Abstract Syntax                    |                        | Transfer Syntax           |                     | Role | Extended Negotiation |
| Name                               | UID                    | Name List                 | UID List            |      |                      |
| Instance Availability Notification | 1.2.840.10008.5.1.4.33 | Implicit VR Little Endian | 1.2.840.10008.1.2   | SCP  | None                 |
|                                    |                        | Explicit VR Little Endian | 1.2.840.10008.1.2.1 |      |                      |

#### 2.2.1.3.2.2 SOP Specific Conformance for IAN SOP Class

Only Study Instance UID (0020,000D) is used by IMPAX RIS to update a flag in the database to indicate that images are available.

## 2.2.2 IMPAX-RIS MPPS AE Specification

### 2.2.2.1 SOP Classes Supported

This Application Entity provides Standard Conformance to the following SOP Class:

**Table 2.2-13: SOP Class**

| SOP Class Name                    | SOP Class UID           | SCU | SCP |
|-----------------------------------|-------------------------|-----|-----|
| <b>Workflow Management</b>        |                         |     |     |
| Modality Performed Procedure Step | 1.2.840.10008.3.1.2.3.3 | No  | Yes |

### 2.2.2.2 Association Establishment Policies

#### 2.2.2.2.1 General

The DICOM standard Application context shall be specified.

**Table 2.2-14: DICOM Application Context**

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

#### 2.2.2.2.2 Number of Associations

**Table 2.2-15: Number of Associations as an Association Initiator**

|                                                       |   |
|-------------------------------------------------------|---|
| Maximum number of simultaneous associations initiated | 1 |
|-------------------------------------------------------|---|

**Table 2.2-16: Number of Associations as an Association Acceptor**

|                                                      |    |
|------------------------------------------------------|----|
| Maximum number of simultaneous associations accepted | 32 |
|------------------------------------------------------|----|

#### 2.2.2.2.3 Asynchronous Nature

**Table 2.2-17: Asynchronous Nature as an Association Initiator**

|                                                         |   |
|---------------------------------------------------------|---|
| Maximum number of outstanding asynchronous transactions | X |
|---------------------------------------------------------|---|

IMPAX RIS MPPS DICOMserver allows a single outstanding operation on any association. Therefore, IMPAX RIS MPPS DICOMserver does not support asynchronous operations window negotiation, other than the default as specified by the DICOM specification.

#### 2.2.2.2.4 Implementation Identifying Information

**Table 2.2-18: DICOM implementation Class and Version**

|                             |                     |
|-----------------------------|---------------------|
| Implementation Class UID    | 1.3.6.1.4.1.30071.8 |
| Implementation Version Name | fo-dicom1.0.37      |

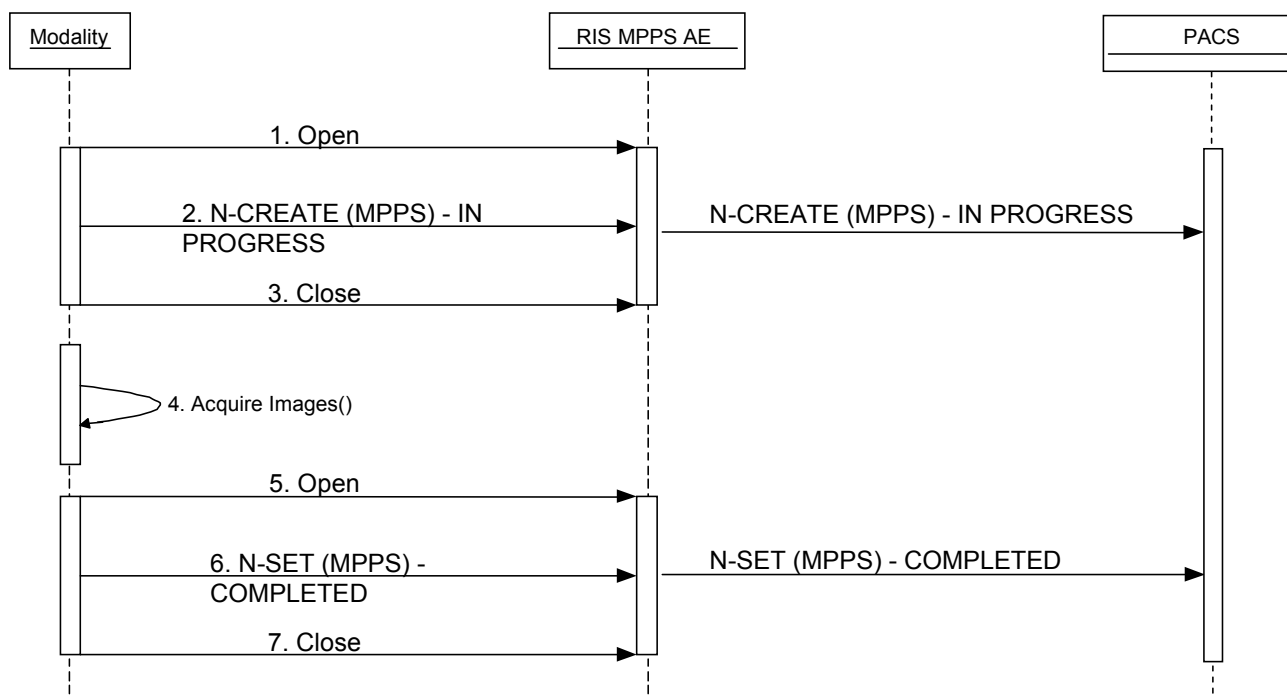


## 2.2.2.3 Association Initiation Policies

### 2.2.2.3.1 Forwarding MPPS messages

#### 2.2.2.3.1.1 Description and Sequencing of Activity

The IMPAX RIS MPPS DICOMserver Application Entity forwards the MPPS received from the Modality to the PACS (image manager). This functionality is required in case IMPAX RIS plays the role of IHE MPPS Manager Actor for the IHE profile “Scheduled Workflow” and “Patient Information Reconciliation”.



**Figure 2.2-3: IMPAX-RIS MPPS forwarding Sequencing Diagram**

#### 2.2.2.3.1.2 Proposed Presentation Contexts

**Table 2.2-19: Presentation Contexts**

| Presentation Context Table        |                         |                           |                     |      |                      |
|-----------------------------------|-------------------------|---------------------------|---------------------|------|----------------------|
| Abstract Syntax                   |                         | Transfer Syntax           |                     | Role | Extended Negotiation |
| Name                              | UID                     | Name List                 | UID List            |      |                      |
| Modality Performed Procedure Step | 1.2.840.10008.3.1.2.3.3 | Implicit VR Little Endian | 1.2.840.10008.1.2   | SCU  | None                 |
|                                   |                         | Explicit VR Little Endian | 1.2.840.10008.1.2.1 |      |                      |

## 2.2.2.4 Association Acceptance Policies

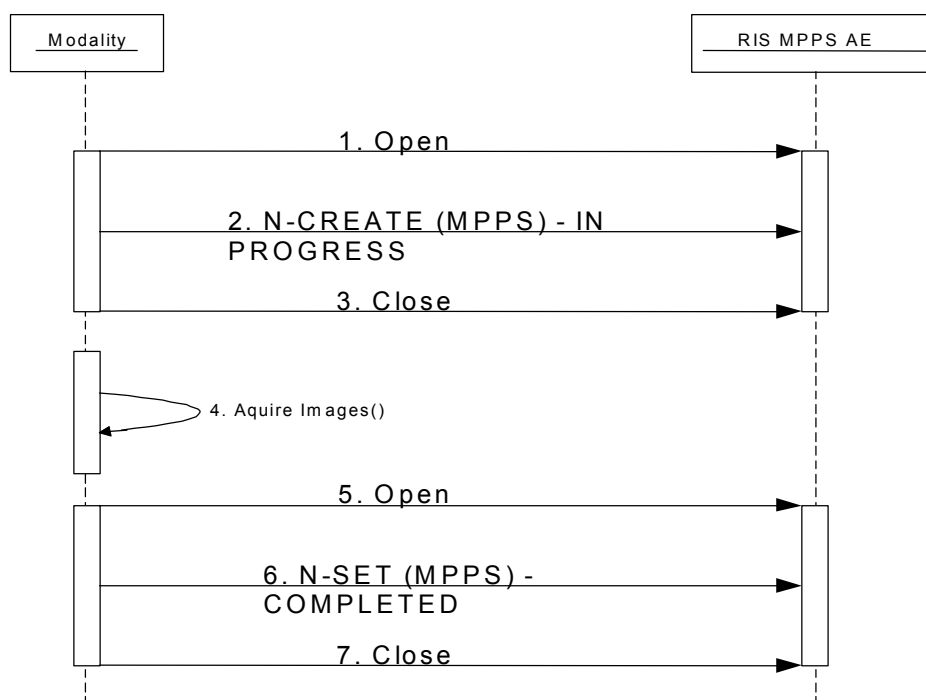
### 2.2.2.4.1 Receive MPPS Request

#### 2.2.2.4.1.1 Description and Sequencing of Activity

After a modality has started the performance of a Procedure Step it should inform the RIS by sending an N-CREATE service request to the RIS MPPS Application Entity.

An N-CREATE event with status "IN PROGRESS" will update the procedure status in IMPAX RIS to "PROCEDURE STARTED".

At the end of the Performed Procedure Step the modality should send an N-SET command with all other mandatory attributes to RIS MPPS Application Entity. An N-SET event with status "COMPLETED" will update the procedure status in IMPAX RIS to "PROCEDURE COMPLETE".



**Figure 2.2-4: IMPAX-RIS MPPS Sequencing Diagram**

### 2.2.2.4.1.2 Accepted Presentation Contexts

**Table 2.2-20: Presentation Contexts**

| Presentation Context Table        |                         |                                                        |                                          |      |                      |
|-----------------------------------|-------------------------|--------------------------------------------------------|------------------------------------------|------|----------------------|
| Abstract Syntax                   |                         | Transfer Syntax                                        |                                          | Role | Extended Negotiation |
| Name                              | UID                     | Name List                                              | UID List                                 |      |                      |
| Modality Performed Procedure Step | 1.2.840.10008.3.1.2.3.3 | Implicit VR Little Endian<br>Explicit VR Little Endian | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.1 | SCP  | None                 |

### 2.2.2.4.1.3 SOP Specific Conformance for MPPS SOP Class

IMPAX RIS MPPS DICOMserver supports all attributes as described in the DICOM Standard part 3.3 for MPPS, however IMPAX RIS MPPS DICOMserver only stores the attributes mentioned in the table below.

**Table 2.2-21: Attributes supported**

| Attribute Name                                                | Tag         | N-Create | N-Set | Comments                          |
|---------------------------------------------------------------|-------------|----------|-------|-----------------------------------|
| <b>PERFORMED PROCEDURE STEP INFORMATION MODULE ATTRIBUTES</b> |             |          |       |                                   |
| Schedule Step Attribute Sequence                              | (0040,0270) | X        |       |                                   |
| >Study Instance UID                                           | (0020,000D) | X        |       |                                   |
| >Accession Number                                             | (0008,0050) | X        |       |                                   |
| >Scheduled Protocol Code Sequence                             | (0040,0008) | X        |       |                                   |
| >>Code Value                                                  | (0008,0100) | X        |       |                                   |
| >>Code Meaning                                                | (0008,0104) | X        |       |                                   |
| Patient ID                                                    | (0010,0020) | X        |       |                                   |
| Patient Name                                                  | (0010,0010) | X        |       |                                   |
| Patient Birth Date                                            | (0010,0030) | X        |       |                                   |
| Patient Sex                                                   | (0010,0040) | X        |       |                                   |
| Performed Procedure Step ID                                   | (0040,0253) | X        |       |                                   |
| Performed Procedure Step Start Date                           | (0040,0244) | X        |       |                                   |
| Performed Procedure Step Start Time                           | (0040,0245) | X        |       |                                   |
| Performed Procedure Step Status                               | (0040,0252) | X        | X     |                                   |
| Procedure Code Sequence                                       | (0008,1032) | X        | X     |                                   |
| >Code Value                                                   | (0008,0100) | X        | X     |                                   |
| >Code Meaning                                                 | (0008,0104) | X        | X     |                                   |
| Modality                                                      | (0008,0060) | X        |       |                                   |
| Performed Protocol Code Sequence                              | (0040,0260) | X        | X     |                                   |
| >Code Value                                                   | (0008,0100) | X        | X     |                                   |
| >Code Meaning                                                 | (0008,0104) | X        | X     |                                   |
| <b>RADIATION DOSE MODULE ATTRIBUTES</b>                       |             |          |       |                                   |
| Total Number of Exposures                                     | (0040,0301) | X        | X     |                                   |
| Distance Source To Detector                                   | (0018,1110) | X        | X     |                                   |
| Entrance Dose dGy                                             | (0040,0302) | X        | X     | Only used if (0040,8302) is empty |
| Entrance Dose in mGy                                          | (0040,8302) | X        | X     |                                   |
| Exposed Area                                                  | (0040,0303) | X        | X     |                                   |

| Attribute Name                          | Tag         | N-Create | N-Set | Comments                          |
|-----------------------------------------|-------------|----------|-------|-----------------------------------|
| Image and Fluoroscopy Area Dose Product | (0018,115E) | X        | X     |                                   |
| Comments on Radiation Dose              | (0040,0310) | X        | X     | Used by certain modalities        |
| Exposure Dose Sequence                  | (0040,030E) | X        | X     |                                   |
| >KVp                                    | (0018,0060) | X        | X     |                                   |
| >X-Ray Tube Current in $\mu$ A          | (0018,8151) | X        | X     |                                   |
| >Exposure Time                          | (0018,1150) | X        | X     | Only used if (0018,8150) is empty |
| >Filter Material                        | (0018,7050) | X        | X     |                                   |

**Table 2.2-22: IMPAX RIS MPPS DICOMserver Response Status**

| Service Status | Further Meaning    | Error Code | Reason                                                  |
|----------------|--------------------|------------|---------------------------------------------------------|
| Success        | Success            | 0000       | Operation performed properly, all matches were returned |
| Error          | Processing Failure | C000       | No access to RIS database                               |

## **2.3 Network Interfaces**

IMPAX RIS DMWL & MPPS DICOMserver provide DICOM V3.0 TCP/IP Network Communication Support as defined in PS 3.8 of the DICOM Standard. IMPAX RIS inherits its TCP/IP stack from the computer system upon which it resides.

### **2.3.1 Physical Medium Support**

IMPAX RIS DMWL & MPPS DICOMserver are indifferent to the physical medium over which TCP/IP executes; they inherit the medium from the computer system upon which they are being executed.

## 2.4 Configuration

### 2.4.1 DMWL DICOMserver AE Title/ Presentation Mapping

#### 2.4.1.1 Local AE Titles

**Table 2.4-1: AE Title Configuration Table**

| Application Entity         | Default AE Title | Default TCP/IP Port |
|----------------------------|------------------|---------------------|
| IMPAX RIS DMWL DICOMserver | RIS_QUADRAT      | 2250                |

#### 2.4.1.2 Configuration Parameters

**Table 2.4-2: Configuration Parameter Table**

| Parameter                                                                                                         | Configurable (Yes/No) | Default Value             |
|-------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------------|
| <b>General Parameters</b>                                                                                         |                       |                           |
| Time-out waiting for acceptance or rejection Response to an Association Open Request. (Application Level timeout) | No                    | 100 seconds               |
| General DIMSE level time-out values                                                                               | No                    | 100 seconds               |
| Time-out waiting for response to TCP/IP connect request. (Low-level timeout)                                      | No                    | 100 seconds               |
| Time-out waiting for acceptance of a TCP/IP message over the network. (Low-level timeout)                         | No                    | 100 seconds               |
| Time-out for waiting for data between TCP/IP packets. (Low-level timeout)                                         | No                    | 100 seconds               |
| Any changes to default TCP/IP settings, such as configurable stack parameters.                                    | No                    | 100 seconds               |
| Other configurable parameters                                                                                     | Logging on/off        | off                       |
| <b>AE Specific Parameters</b>                                                                                     |                       |                           |
| Size constraint in maximum object size                                                                            | No                    |                           |
| Maximum PDU size the AE can receive                                                                               | No                    | 65542                     |
| Maximum PDU size the AE can send                                                                                  | No                    | 65542                     |
| 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                         | No                    |                           |
| <Transfer Syntax support>, e.g. JPEG, Explicit VR, when configurable                                              | No                    | Implicit VR Little Endian |
| Other parameters that are configurable                                                                            |                       |                           |

## 2.4.2 MPPS DICOMserver AE Title/ Presentation Mapping

### 2.4.2.1 Local AE Titles

**Table 2.4-3: AE Title Configuration Table**

| Application Entity         | Default AE Title                                                                                                   | Default TCP/IP Port                                                                                         |
|----------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| IMPAX RIS MPPS DICOMserver | No default AE title.<br>The AE title has to be configured and must be different from the DMWL DICOMserver default. | No default Port number.<br>It has to be configured and must be different from the DMWL DICOMserver default. |

### 2.4.2.2 Remote AE Titles

Remote AE titles are stored in the database and are entered via the GUI.

#### 2.4.2.2.1 Remote SCP

Remote AET port number, host-names and IP addresses are stored in the database. Either the IP address or host-name is needed.

### 2.4.2.3 Configuration Parameters

**Table 2.4-4: Configuration Parameter Table**

| Parameter                                                                                                         | Configurable (Yes/No) | Default Value             |
|-------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------------|
| <b>General Parameters</b>                                                                                         |                       |                           |
| Time-out waiting for acceptance or rejection Response to an Association Open Request. (Application Level timeout) | No                    | 100 seconds               |
| General DIMSE level time-out values                                                                               | No                    | 100 seconds               |
| Time-out waiting for response to TCP/IP connect request. (Low-level timeout)                                      | No                    | 100 seconds               |
| Time-out waiting for acceptance of a TCP/IP message over the network. (Low-level timeout)                         | No                    | 100 seconds               |
| Time-out for waiting for data between TCP/IP packets. (Low-level timeout)                                         | No                    | 100 seconds               |
| Any changes to default TCP/IP settings, such as configurable stack parameters.                                    | No                    | 100 seconds               |
| Other configurable parameters                                                                                     | Logging on/off        | off                       |
| <b>AE Specific Parameters</b>                                                                                     |                       |                           |
| Size constraint in maximum object size                                                                            | No                    |                           |
| Maximum PDU size the AE can receive                                                                               | No                    | 65542                     |
| Maximum PDU size the AE can send                                                                                  | No                    | 65542                     |
| AE specific DIMSE level time-out values                                                                           | No                    |                           |
| Calling AE specific parameters can be configured using custom scripts                                             | Yes                   |                           |
| Number of simultaneous Associations by Service and/or SOP Class                                                   | No                    |                           |
| <Transfer Syntax support>, e.g. JPEG, Explicit VR, when configurable                                              | No                    | Implicit VR Little Endian |
| Other parameters that are configurable                                                                            |                       |                           |

## 3 MEDIA INTERCHANGE

Not supported.



## 4 SUPPORT FOR EXTENDED CHARACTER SETS

IMPAX RIS DMWL & MPPS DICOMserver support the following character sets:

|                      |                      |
|----------------------|----------------------|
| • ISO-IR 6 (default) | Basic G0 Set         |
| • ISO-IR 100         | Latin Alphabet No. 1 |

## **5 SECURITY**

### **5.1 Security Profiles**

### **5.2 Association Level Security**

IMPAX RIS DMWL & MPPS DICOMserver keep a list of allowed AE-titles. When the list is empty, all AE-titles are accepted.

### **5.3 Application Level Security**

The RIS database is password protected.

## **6 ANNEXES**

### **6.1 IOD Contents**

#### **6.1.1 Usage of Attributes from Basic Worklist Management IOD**

IMPAX RIS DMWL DICOMserver provides standard conformance to the DICOM Basic Worklist Management Service Class.

#### **6.1.2 Usage of Attributes from Modality Performed Procedure Step IOD**

IMPAX RIS MPPS DICOMserver provides standard conformance to the DICOM Modality Performed Procedure Step Service Class.

#### **6.1.3 Usage of Attributes from Instance Availability Notification IOD**

IMPAX RIS DMWL DICOMserver provides standard conformance to the DICOM Instance Availability Notification Service Class.

IMPAX RIS DMWL DICOMserver uses the following elements for this SOP class (other elements are ignored):

| Attribute Name     | Tag         |
|--------------------|-------------|
| Study Instance UID | (0020,000D) |