Digital Imaging and Communications in Medicine (DICOM)

Supplement NNN: DICOMweb Modality Services

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**DICOM Standards Committee, Working Group 6**

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# Document History

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| --- | --- | --- | --- |
| 2024.08 | Version 00 | JM, DK | Initial version with proposed document structure and content |
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# Open Issues

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# Closed Issues

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# Scope and Field of Application

The DICOMweb Modality Services are an extension to the existing DICOMweb services, mimicking the Modality Worklist (MWL) and Modality Performed Procedure Step (MPPS) services that are already available in DIMSE. It has been designed such that it is relatively easy to create proxies from/to DIMSE to/from DICOMweb Modality Services.

This supplement describes the way to perform modality services MWL and MPPS based on DICOMweb’s UPS-RS.

**Changes to NEMA Standards Publications PS 3.18**

Add new section X Modality Services and Resources

# X Modality Services and Resources

## X.1 Overview

The Modality Services provide modality-oriented workflow management for user agents. These services correspond to the DIMSE Modality Worklist (MWL) and Modality Performed Procedure Step (MPPS) services as defined in Annexes K and F of PS3.4 respectively and have – where possible – the same semantics.

The Modality Services do not define their own resources but apply the Worklist Service’s resources as defined in Section 11.

There are several conceptual differences between the DIMSE services that are mirrored by the Modality Services and the Worklist Service that is used to supply the Modality Services. These differences are elaborated on below.

### X.1.1 Entities

The DIMSE MWL and MPPS services distinguish between two kinds of entities, namely Worklists (with Workitems, each denoting a scheduled procedure step) and Modality Performed Procedure Steps. Here, Workitems are merely the input of the acquisition process, and performed procedure steps represent the log of what has been done at the modality. The DICOMweb Worklist Service only knows about Workitems, where progress – the set of performed procedure steps – is part of a Workitem.

Using DIMSE MWL and MPPS SCUs must copy applicable information from a Workitem to related performed procedure steps, that also need to be created. Using DICOMweb Worklist Service this is not needed, as all information is present in one object: the Workitem.

### X.1.2 Notification

While the DIMSE MPPS service utilizes the SCP initiated N-EVENT-REPORT for unsolicited state change notifications, the Worklist Service has a subscription mechanism for notifying user agents for all kinds of changes, based on websockets. Hence there is a possible mismatch in information, and therefore the scope is limited to state changes only. Furthermore, as there is no subscription in DIMSE, it is left open how the SCP knows about what SCUs are to be notified at state changes of Workitems; a possible approach to this could be having this as a configuration item of the SCP.

## X.2 Conformance

Implementations conforming to the Modality Services shall support the transactions listed as Required in Table X.2-1.

Table X.2-1. Required and Optional Transactions

| Transaction | Support | Section |
| --- | --- | --- |
| Get Applicable Worktems | Required | Section X.4 |
| Claim and Prepare Workitem | Required | Section X.5 |
| Report Progress on Workitem |  | Section X.6 |
| Change Workitem State |  | Section X.7 |
| Retrieve Workitem |  | Section X.8 |
| Get Notified |  | Section X.9 |

Implementations conforming to the Storage Commitment Service shall specify their role in their Conformance Statement (see PS3.2): origin server, user agent or both.

In addition, for each supported transaction they shall specify:

* the supported Query Parameters, including optional Attributes, if any;
* the supported DICOM Media Types;
* the supported character sets (if other than UTF-8).

An origin server conforming to the Modality Services shall implement the Retrieve Capabilities Transaction, specifying its role (see Section 8.9 and Annex H).

Implementation-specific warning and error codes shall be included in the Conformance Statement.

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## X.3 Transaction Overview

Table X.3-1 shows the Modality Services transactions.

Table X.3-1. Modality Services Transactions

| Transaction Name | Method | Payload | | Description |
| --- | --- | --- | --- | --- |
| Request | Success Response |
| Get Applicable Workitems | GET | none | results | Gets applicable Target Workitems |
| Claim and Prepare Workitem | PUT | none | none | Claims a Target Workitem and fills it with the initial information |
| POST | dataset | none |
| Report Progress on Workitem | POST | dataset | none | Updates the Target Workitem with new information |
| Change Workitem State | PUT | none | none | Changes the state of the Target Workitem |
| Retrieve Workitem | GET | none | dataset | Retrieves the Target Workitem |
| Get Notified | N.A. | N.A. | N.A. | Gets notified about changes of Target Workitems |

There is no method of getting notified, as this is subscription based, in line with the Worklist Service.

Table X.3-2 shows how the Modality Services transactions are mapped from MWL and MPPS operations and notifications to Worklist Service transactions.

Table X.3-2. Mapping Modality Services

| MWL and MPPS | | Modality Services | Worklist Service | |
| --- | --- | --- | --- | --- |
| Query | PS3.4, K.4 | Get Applicable Workitems | Search | 11.9 |
| Create | PS3.4, F.7.2.1 | Claim and Prepare Workitem | Change Workitem State | 11.7 |
| Update Workitem | 11.6 |
| Set Information | PS3.4, F.7.2.2 | Report Progress on Workitem | Update Workitem | 11.6 |
| Change Workitem State | Change Workitem State | 11.7 |
| Get Information | PS3.4, F.8.2.1 | Retrieve Workitem | Retrieve Workitem | 11.5 |
| Receive Event Notification | PS3.4, F.9.2.1 | Get Notified | N.A. | 11.11-11.13 |

## X.4 Get Applicable Workitems Transaction

This transaction searches the Worklist for Workitems that match the specified Query Parameters and returns a list of matching Workitems. Each Workitem in the returned list includes return Attributes specified in the request. The transaction is equal to the UPS-RS Search Transaction.

### X.4.1 Request

See 11.9.1.

The list of attributes in the C-FIND-RQ corresponds to the list of matching keys in the request.

#### X.4.1.1 Target Resources

#### X.4.1.2 Query Parameters

#### X.4.1.3 Request Header Fields

#### X.4.1.4 Request Payload

### X.4.2 Behavior

### X.4.3 Response

### X.4.3.1 Status Codes

### X.4.3.2 Response Header Fields

### X.4.3.3 Response Payload

## X.5 Claim and Prepare Workitem Transaction

### X.5.1 Request

#### X.5.1.1 Target Resources

#### X.5.1.2 Query Parameters

#### X.5.1.3 Request Header Fields

#### X.5.1.4 Request Payload

### X.5.2 Behavior

### X.5.3 Response

### X.5.3.1 Status Codes

### X.5.3.2 Response Header Fields

### X.5.3.3 Response Payload

## X.6 Report Progress on Workitem Transaction

### X.6.1 Request

#### X.6.1.1 Target Resources

#### X.6.1.2 Query Parameters

#### X.6.1.3 Request Header Fields

#### X.6.1.4 Request Payload

### X.6.2 Behavior

### X.6.3 Response

### X.6.3.1 Status Codes

### X.6.3.2 Response Header Fields

### X.6.3.3 Response Payload

## X.7 Change Workitem State Transaction

### X.7.1 Request

#### X.7.1.1 Target Resources

#### X.7.1.2 Query Parameters

#### X.7.1.3 Request Header Fields

#### X.7.1.4 Request Payload

### X.7.2 Behavior

### X.7.3 Response

### X.7.3.1 Status Codes

### X.7.3.2 Response Header Fields

### X.7.3.3 Response Payload

## X.8 Retrieve Workitem Transaction

### X.8.1 Request

#### X.8.1.1 Target Resources

#### X.8.1.2 Query Parameters

#### X.8.1.3 Request Header Fields

#### X.8.1.4 Request Payload

### X.8.2 Behavior

### X.8.3 Response

### X.8.3.1 Status Codes

### X.8.3.2 Response Header Fields

### X.8.3.3 Response Payload

## X.9 Get Notified Transaction

### X.9.1 Request

#### X.9.1.1 Target Resources

#### X.9.1.2 Query Parameters

#### X.9.1.3 Request Header Fields

#### X.9.1.4 Request Payload

### X.9.2 Behavior

### X.9.3 Response

### X.9.3.1 Status Codes

### X.9.3.2 Response Header Fields

### X.9.3.3 Response Payload

**Changes to NEMA Standards Publications PS 3.4**

Update section F.9

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Note

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1. The terms IS and PACS used in the previous example are provided for clarification purposes only. This document does not define nor constrain the purpose or role of any IS, PACS or acquisition Application Entity conforming to this Service Class Specification.
2. **It is beyond the scope of the specification to define how the SCP knows about what SCUs to notify about changes. A possible way would be to make this a configuration item of the SCP.**