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IHE Radiology Technical Framework Supplement

10

Manifest-based Access to DICOM Objects (MADO)

For review and comment only.

DO NOT implement this public comment version.

15

<For FHIR based profiles, indicate the FHIR release number & the FMM levels of the contents; otherwise, delete the two following lines.>

HL7[®] FHIR[®] STU **x**

Using Resources at FMM Level **n-n**

20

Revision 0.4 – Draft in Preparation for Public Comment

Date: August 18, 2025

Author: IHE-HL7 Europe Sub-team on imaging manifest

Email:

25

Please verify you have the most recent version of this document. See [here](#) for Trial Implementation and Final Text versions and [here](#) for Public Comment versions.

<Instructions to authors are encapsulated in angled brackets as “< ... >” and denoted with italicized text. These instructions should be deleted entirely prior to publication.>

- 30 *<Use of capitalization: Please follow standard English grammar rules-only proper nouns and names are upper case. For example, “Modality Actor” is upper case, but “an actor which fulfills the role of a modality” is lower case. Do not use upper case to emphasize a word/topic. Examples:*

- 35 *<Note: Before creating a draft supplement, please review the editing conventions, which include information such as section, table and diagram numbering and how to use Microsoft Word tools, at http://wiki.ihe.net/index.php?title=Writing_Technical_Frameworks_and_Supplements. This guidance is especially useful for first time authors.>*

- 40 *<This supplement template is intended for developing new profiles or making significant changes to profiles, such as adding formal options. Simple changes to existing supplements or profiles should be made using the Change Proposal (CP) process. See the Technical Framework Development section at http://wiki.ihe.net/index.php?title=Process#Technical_Framework_Development for more guidance on supplements vs. CPs.>*

- 45 *<All of the sections in this document are required. Sections may not be deleted. The outline numbering is intended to be consistent across profiles and across domains, so do not adjust the outline numbering. If there is no relevant content for a section, simply state “Section not applicable”, but leave the numbering intact. Sub-sections may be added for clarity.>*

<This supplement template includes templates for Volumes 1 (Profiles), 2 (Transactions), 3 (Content Modules), and 4 (National Extensions).>

- 50 *<Volumes 1, 2, and/or 3 are developed together for Public Comment and Trial Implementation submission. Volume 4, National Extensions, is typically developed at a later point in time, usually at Trial Implementation or later. Templates for all four volumes are included in this document for the sake of completeness. If you are beginning a new profile, you are strongly discouraged from using National Extensions and should instead focus on optional data sets or*
- 55 *other alternatives. For more information, see http://wiki.ihe.net/index.php?title=National_Extensions_Process.>*

Foreword

Note: This document is prepared to become a future supplement to the IHE Radiology Technical Framework. It anticipates the acceptance of a new profile proposal submitted on July 20th 2025 to the IHE Radiology 2025-2026 Cycle. It is developed by the IHE-HL7 Europe Working Group on Imaging with the goal to use this new profile in the context of the EHDS use case on the sharing of imaging studies and related imaging reports.

This is intended to be a supplement to the IHE Radiology Technical Framework V22.0. Each supplement undergoes a process of public comment and trial implementation before being incorporated into the volumes of the Technical Frameworks.

This supplement is published on **Month XX, 2025** for Public Comment. Comments are invited and can be submitted at https://www.ihe.net/Radiology_Public_Comments. In order to be considered in development of the Trial Implementation version of the supplement, comments must be received by **Month XX, 2025**.

This supplement describes changes to the existing technical framework documents.

“Boxed” instructions like the sample below indicate to the Volume Editor how to integrate the relevant section(s) into the relevant Technical Framework volume.

Amend section X.X by the following:

Where the amendment adds text, make the added text **bold underline**. Where the amendment removes text, make the removed text **~~bold strikethrough~~**. When entire new sections are added, introduce with editor’s instructions to “add new text” or similar, which for readability are not bolded or underlined.

General information about IHE can be found at [IHE](#).

Information about the IHE <domain name> domain can be found at [IHE Domains](#).

Information about the organization of IHE Technical Frameworks and Supplements and the process used to create them can be found at [Profiles](#) and [IHE Process](#)

The current version of the Radiology Technical Framework can be found at [Radiology Technical Framework](#).

<Comments may be submitted on IHE Technical Framework templates any time at http://ihe.net/Templates_Public_Comments. Please enter comments/issues as soon as they are found. Do not wait until a future review cycle is announced.>

Temporary Note: In term of structure of the profile here the skeleton:

1. **The volume 1** is the profile overview in term of Actor/Transactions, the overall use case and associated scenarios. Volume 1 will also state the required and optional transactions, as well as the required/optional grouping. For the Actor/Transactions, I recommend:

a. create a “document creator Actor“ that produces the Imaging Manifest with a “convey manifest content” transaction to a “document consumer Actor”. IHE in its profiles that define only content, has a “convey content transactions” (not sure this is the official name, but you should get the concept).

b. The “convey manifest transaction” should define two options:

i. A DICOM KOS Based Manifest option that references the Section A of the volume 2 manifest content (see below)

ii. A FHIR Based Manifest option that references the Section B of the volume 3 manifest content (see below)

c. The Imaging Document Consumer Actor that will issue the WADO Retrieve Transaction to the Imaging Document Source Actor, will be required to be grouped with the Document Consumer Actor.

2. **Volume 2 Chapter on the WADO-RS Retrieve Transaction.**

3. **A volume 3 Chapter on the Manifest content** that includes a section A on the DICOM KOS based Manifest, and one section B on the FHIR based Manifest. The section C (for information) would include the mapping of A to B and B from A.

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Introduction to this Supplement

<If this is a FHIR based profile, include the following boxed in text and complete the table within; otherwise, delete the text in its entirety.>

Whenever possible, IHE profiles are based on established and stable underlying standards. However, if an IHE domain determines that an emerging standard has high likelihood of industry adoption, and the standard offers significant benefits for the use cases it is attempting to address, the domain may develop IHE profiles based on such a standard. During Trial Implementation, the IHE domain will update and republish the IHE profile as the underlying standard evolves.

Product implementations and site deployments may need to be updated in order for them to remain interoperable and conformant with an updated IHE profile.

This <profile acronym> Profile (or This Technical Framework Supplement) incorporates content from Release 4 of the HL7[®] FHIR[®] specification. HL7 describes FHIR Change Management and Versioning at <https://www.hl7.org/fhir/versions.html>.

HL7 provides a rating of the maturity of FHIR content based on the FHIR Maturity Model (FMM): level 0 (draft) through N (Normative). See <http://hl7.org/fhir/versions.html#maturity>.

The FMM levels for FHIR content used in this profile are:

| FHIR Content (Resources, ValueSets, etc.) | FMM Level |
|--|-----------|
| | |
| | |
| <e.g., Communication | 2> |

<Provide a brief overview of the volumes/sections of the Technical Framework that get changed/ added by this supplement. Provide 200 words or less describing this supplement.>

This new work item proposal aims to define a new IHE profile to address the *access to DICOM Instances based on an imaging study manifest*.

The need for this profile was identified as part of the sharing of imaging studies and related reports as required under the EHDS Regulation (see discussion below).

Such an access was initially introduced by a part of the XDS-I.b profile almost 20 years ago. The XDS-I profile has introduced the concept of a manifest, a document that summarizes the content of an imaging study, its structure with the identification and the location where

various instances that belong to the study may be retrieved. The XDS-I.b profile leverages the XDS profile to support the discovery of such manifest documents through a document registry query and its retrieval from a document repository.

275 With the introduction of a FHIR based document sharing with the MHDS Profile, there is a demand to combine MHDS along with a profile that covers the access to DICOM Instances leveraging the information contained in shared imaging study manifests.

280 The need for such a new profile that addresses the *access to DICOM Instances based on an imaging study manifest* could be combined either with XDS or MHDS (or MHD), or some proprietary document sharing scheme. Such flexibility ensures a common and more effective way to access the DICOM Objects through a solid profiling of WADO-RS and the use of a more robust Imaging Study Manifest supporting two complementary encodings based on the DICOM KOS IOD or FHIR Imaging Study resource, as well as profiling in a more precise way existing attributes and new attributes, such as those necessary to improve the access to

285 key images.

Open Issues and Questions

| # | Issue / Answer |
|----|-----------------|
| 1. | Q: TC: A: |

Closed Issues

| # | Issue / Answer |
|----|-----------------|
| 1. | Q: TC: A: |

290 IHE Technical Frameworks General Introduction

The [IHE Technical Frameworks General Introduction](#) is shared by all of the IHE domain technical frameworks. Each technical framework volume contains links to this document where appropriate.

9 Copyright Licenses

- 295 IHE technical documents refer to, and make use of, a number of standards developed and published by several standards development organizations. Please refer to the IHE Technical Frameworks General Introduction, [Section 9 - Copyright Licenses](#) for copyright license information for frequently referenced base standards. Information pertaining to the use of IHE International copyrighted materials is also available there.

300 10 Trademark

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305 IHE Technical Frameworks General Introduction Appendices

The [IHE Technical Framework General Introduction Appendices](#) are components shared by all of the IHE domain technical frameworks. Each technical framework volume contains links to these documents where appropriate.

310 *Update the following appendices to the General Introduction as indicated below. Note that these are **not** appendices to this domain's Technical Framework (TF-1, TF-2, TF-3 or TF-4) but rather, they are appendices to the IHE Technical Frameworks General Introduction located [here](#).*

315 [Appendix A](#) – Actors

*Add the following **new or modified** actors to the [IHE Technical Frameworks General Introduction Appendix A](#):*

| New (or modified) Actor Name | Description |
|------------------------------|---|
| | <i>If this is a modified actor description, add the original description and use <u>bold underline</u> to indicate where the amendment adds text and bold strikethrough where the amendment removes text</i> |
| | |

320

The table below lists *existing* actors that are utilized in this profile.

Complete List of Existing Actors Utilized in this Profile

| Existing Actor Name | Definition |
|---------------------------|--|
| Content Creator | The Content Creator Actor creates content and transmits to a Content Consumer. |
| Content Consumer | The Content Consumer Actor views, imports, or performs other processing of content created by a Content Creator Actor. |
| Imaging Document Consumer | A system that makes use of imaging data. |
| Imaging Document Source | Publishes imaging data and makes it available for retrieval. |

[Appendix B](#) – Transactions

325

| New (or modified) Transaction Name and Number | Definition |
|---|---|
| <i>WADO-RS Get Instances [RAD-1xy]</i> | <i>Get DICOM Instances from the Imaging Document Source at a Study, Series or Instance level.</i> |

Appendix D – Glossary

330

No new or modified glossary terms.

Volume 1 – Profiles

Domain-specific additions

None.

335

| |
|--------------------------|
| <i>Add new Section #</i> |
|--------------------------|

Used section number 59 – not formally reserved yet – (*Reserve a subsequent section number in the current domain Technical Framework Volume 1 (DOM TF-1)*).

340 **59 Manifest-based Access to DICOM Objects (MADO) Profile**

The Manifest-based Access to DICOM Objects (MADO) Integration Profile specifies actors and transactions to retrieve patient-relevant DICOM Instances from medical imaging studies being held within a community. Each community may have multiple sources of medical images data that publish it for sharing within the community.

345 The XDS.b or MHD profiles define specific means of retrieving the Imaging Study Manifests that reference DICOM Instances stored in the community and that were “published” by their holders into the community-level document registry for sharing within the community.

The MADO profile utilizes RESTful DICOMWeb Studies Service Retrieve transaction (a.k.a WADO-RS, DICOM [PS3.18 Section 10.4](#)).

350 The reader of MADO is expected to understand the use of Imaging Study Manifests.

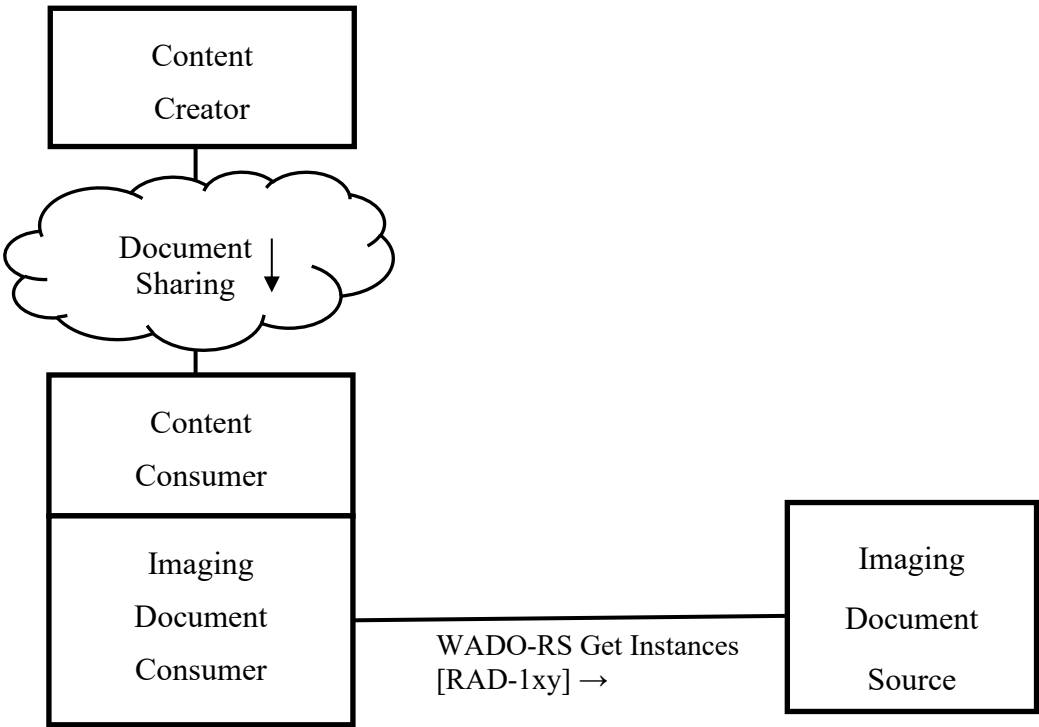
59.1 MADO Actors, Transactions, and Content Modules

This section defines the actors, transactions, and/or content modules in this profile. General definitions of actors are given in the Technical Frameworks General Introduction Appendix A. IHE Transactions can be found in the Technical Frameworks General Introduction Appendix B.

355 Both appendices are located at <https://profiles.ihe.net/GeneralIntro/index.html>.

Figure X.1-1 shows the actors directly involved in the MADO Profile and the relevant transactions/content between them.

360 The Imaging Document Consumer obtains the Imaging Manifests from the local community through grouping with different actors in the ITI profiles that can provide access to the XDS / MHD infrastructure, such as the XDS.b Document Consumer or MHD Document Consumer. The XDS.b Document Consumer and MHD Document Consumer are NOT included in this profile.



365 **Figure X.1-1: MADO Actor Diagram**

Table X.1-1 lists the transactions/content for each actor directly involved in the Manifest-based Access to DICOM Objects (MADO) Profile. To claim compliance with this profile, an actor shall support all required transactions/content (labeled “R”) and may support the optional transactions (labeled “O”).

370 **Table X.1-1: MADO Profile - Actors and Transactions**

| Actors | Transactions | Content Modules | Requestor or Responder | Optionality | Reference |
|---------------------------|---------------------------------|------------------------|------------------------|--------------|--------------------------|
| Content Creator | | Imaging Study Manifest | | R See Note 1 | RAD TF-3: 6.3.1.D |
| Content Consumer | | Imaging Study Manifest | | R See Note 1 | RAD TF-3: 6.3.1.D |
| Imaging Document Consumer | WADO-RS Get Instances [RAD-1xy] | | Requestor | R | RAD TF-2: 3.1xy |
| Imaging Document Source | WADO-RS Get Instances [RAD-1xy] | | Responder | R | RAD TF-2: 3.1xy |

Note 1: The Imaging Study Manifest content is defined in two complementary encodings – DICOM KOS IOD and FHIR Imaging Study Manifest Bundle.

X.1.1 Actor Descriptions and Actor Profile Requirements

375 Some requirements are documented in MADO TF-2 Transactions. This section documents any additional requirements on profile's actors.

No additional requirements needed.

Some requirements are documented in MADO TF-3 Content Modules. This section documents any additional requirements on profile's actors.

380 No additional requirements needed.

X.1.1.1 Content Creator

The Content Creator produces Imaging Study Manifests documents that are shared through a document sharing infrastructure, not specified by this profile.

X.1.1.2 Content Consumer

385 The Content Consumer consumes information provided by Imaging Study Manifests documents that are shared through a document sharing infrastructure, not specified by this profile.

X.1.1.3 Imaging Document Consumer

The Imaging Document Consumer requests and receives DICOM instances from an Imaging Document Source.

390 The Imaging Document Consumer obtains the Imaging Study Manifest(s) identifying DICOM Studies of interest from the grouped Document Consumer that uses appropriate transactions (e.g. from other IHE Profiles such as MHD, MHDS or XDS.b) to search and retrieve such Imaging Study Manifest(s) within the community.

395 Using the information from an Imaging Study Manifest the Imaging Document Consumer determines which DICOM Instance(s) it will retrieve.

Note: The Imaging Study Manifests do not identify individual frames within multi-frame objects, and as such, there is no possibility to retrieve individual frames using the MADO profile.

400 The Imaging Document Consumer issues a WADO-RS Get Instances [RAD-1xy] transaction in the Requestor role to the Imaging Document Source to retrieve the DICOM instances from Imaging Document Sources within the community.

The Imaging Document Consumer forms the Study Service Retrieve Request URL by using the following metadata elements from the retrieved Imaging Study Manifests:

- Study Instance UID

- Series Instance UID, as needed

- 405 • SOP Instance UID, as needed

The Imaging Document Consumer will typically retrieve all DICOM instances listed in the Imaging Study Manifest that belongs to the same series from a specific Imaging Document Source within the community, by retrieving a Series Instances resource. Alternatively, it may choose to retrieve each Instance resource individually.

- 410 The Imaging Document Consumer shall be aware that the list of instances of one series or study referenced in an Imaging Study Manifest may not be the same as all the instances of that series or study available at an Imaging Document Source and published by it for sharing within the community. In this case, the number of instances retrieved by using the request for Series Instances or Study Instances resource may be larger or smaller than the number of instances
415 expected by the Imaging Document Consumer.

X.1.1.4 Imaging Document Source

- 420 The Imaging Document Source receives a WADO-RS Get Instances [RAD-1xy] transaction request from an Imaging Document Consumer to retrieve the requested instances and returns them to the requestor. If the <resource> component of the inbound request indicates the request for retrieval of a complete study or series, Imaging Document Source may select to only return those DICOM Instances that have been published by it in an Imaging Study Manifest.

X.2 MADO Actor Options

- 425 Options that may be selected for each actor in this profile, if any, are listed in the Table X.2-1. Dependencies between options, when applicable, are specified in notes.

Table X.2-1: MADO – Actors and Options

| Actor | Option Name | Reference |
|---------------------------|---|-----------|
| Content Creator | DICOM KOS-based Imaging Study Manifest (Note 1) | See X.2.1 |
| Content Creator | FHIR-Based Imaging Study Manifest (Note 1) | See X.2.1 |
| Content Consumer | DICOM KOS-based Imaging Study Manifest (Note 2) | See X.2.2 |
| Content Consumer | FHIR-Based Imaging Study Manifest (Note 2) | See X.2.2 |
| Imaging Document Consumer | Rendered Instances (Note 3) | See X.2.3 |
| Imaging Document Source | Rendered Instances (Note 3) | See X.2.3 |

Note 1: at least one of these two options shall be supported.

Note 2: at least one of these two options shall be supported.

Note 3: at least one of these two options shall be supported.

430

<Add a sub-section below for every new option defined in Table X.2-1.>

X.2.1 <Option Name>

435 *<First, include a sentence with a high-level description of the option. What capability does this option enable in the profile? Then, enumerate the specific requirements for the actor(s) that support this option.>*

An <actor name> that supports this option shall *<Describe the requirements associated with this option.>*

440 *<Sometimes an option requires that an optional transaction becomes mandatory. In that case, list the transaction as Optional in Table X.1-1, but indicate in this section that it is required, e.g., Transaction [DOM-Y4 is required for Actor-B that supports this option.]>*

445 *<Sometimes an option requires that the actor be grouped with an actor in another profile. In that case, describe that here and also refer to the Required Grouping table in the next section. E.g., "An Actor-A that supports the Really Secure Option shall be grouped with an Secure Node or Secure Application in the ATNA Profile. See Table X.3-1.">*

<Repeat this section (and increment numbering) as needed for additional options.>

X.3 MADO Required Actor Groupings

450 An actor from this profile (Column 1) shall implement all of the required transactions and/or content modules in this profile ***in addition to all*** of the requirements for the grouped actor (Column 2) (Column 3 in alternative 2).

If this is a content profile, and actors from this profile are grouped with actors from a workflow or transport profile, the Reference column references any specifications for mapping data from the content module into data elements from the workflow or transport transactions.

455 In some cases, required groupings are defined as at least one of an enumerated set of possible actors; this is designated by merging column one into a single cell spanning multiple potential grouped actors. Notes are used to highlight this situation.

Section X.5 describes some optional groupings that may be of interest for security considerations and Section X.6 describes some optional groupings in other related profiles.

| MADO Actor | Actor(s) to be grouped with | Reference | Content Bindings Reference |
|------------------|-----------------------------|-------------|----------------------------|
| Content Consumer | Imaging Document Consumer | RAD TF-1:59 | |
| | Content Consumer | RAD TF-1:59 | |

| MADO Actor | Actor(s) to be grouped with | Reference | Content Bindings Reference |
|---------------------------|--|-------------------------------|----------------------------|
| Imaging Document Consumer | ITI CT / Time Client | ITI TF-1: 7.1 | |
| | ITI ATNA / Secure Node or Secure Application | ITI TF-1: 9.1 | |
| Imaging Document Source | ITI CT / Time Client | ITI TF-1: 7.1 | |
| | ITI ATNA / Secure Node or Secure Application | ITI TF-1: 9.1 | |

460

X.4 MADO Overview

X.4.1 Concepts

X.4.1.1 Intra-community sharing infrastructure

465 MADO enables retrieval of imaging studies shared within an enterprise and across enterprises using RESTful services. The Imaging Document Consumer is typically an application that is grouped with an actor providing access to the Imaging Study Manifest that contains a list of DICOM Instances published by an Imaging Document Source in the community. The mechanism of obtaining the Imaging Study Manifest is not constrained, and several models may be used in conjunction with the MADO Profile, , including but not limited to XDS.b, MHD, 470 MHDS.

As an example, the Imaging Document Consumer can discover and retrieve Imaging Study Manifests across community lines by grouping with one of the following actors:

- 475 • XDS.b Document Consumer: The MADO Content Consumer/Imaging Document Consumer is grouped with the XDS.b Document Consumer that is the initiator of the document discovery and retrieval and communicates with the XDS Document Registry/Repositories using the Registry Stored Query [ITI-18] and Retrieve Document Set [ITI-43] transactions. The XDS.b Document Consumer then transfers that information to the Imaging Document Consumer.
- 480 • MHD Consumer: The MADO Content Consumer/Imaging Document Consumer is grouped with the MHD Document Consumer that is the initiator of the document discovery and retrieval and communicates with the MHD Document Responder. The MHD Document Consumer uses the Find Document References [ITI-67] and Retrieve Document [ITI-68] transactions to find and return the retrieved Imaging Manifests. The MHD Consumer then provides this information to the Imaging Document Consumer.

485 The Imaging Study Manifests retrieved by an actor with which the Imaging Document Consumer is grouped are documents formatted either as a DICOM KOS based or a FHIR Imaging Manifest based document.

Once the Imaging Document Consumer has access to an Imaging Study Manifest, it forms the request to retrieve selected DICOM instances from the target Imaging Document Source.

490 As a result, the Imaging Document Consumer can retrieve imaging studies from an Imaging Document Source using a consistent mechanism, regardless of whether the imaging study is published to an XDS.b or MHD environment.

Similarly, the Imaging Document Source returns instances from imaging studies in response to retrieve requests. The source of the imaging studies is not constrained, and several models are
495 possible. The Imaging Document Source can retrieve imaging studies from sources such as:

- Image Manager/Image Archive: The Imaging Document Source can have direct access to the Image Manager/Image Archive, or it can communicate with one or more Image Managers/Image Archives via standard mechanism such as the Retrieve Images [RAD-16] transaction.
- 500 • XDS-I.b Imaging Document Source: The Imaging Document Source can have direct access to the XDS-I.b Imaging Document Source, or it can communicate with one or more XDS-I.b Imaging Document Sources via retrieval mechanisms defined in XDS-I.b.

X.4.1.2 Imaging Reports

MADO focuses on retrieving DICOM Instances using RESTful services. Other imaging study-related documents, such as radiology reports in CDA or FHIR based formats are outside the
505 scope of the MADO Profile and may be retrieved using the ITI MHD Actors or the XDS.b Actors.

X.4.1.3 DICOMweb Study Service Retrieve transaction URI

The DICOMweb Study Service Retrieve transaction URI used in the [RAD-1xy] transaction
510 between Imaging Document Consumer and Imaging Document Source is formed as described in this section.

The HTTP Request URI for the DICOMweb Retrieve Transaction of the Studies Service is formed from the `<protocol>` component, `<endpoint>` component and `<resource>` component.

The value of the `<protocol>` component shall be set to <https://>.

515 The `<endpoint>` component of DICOMweb Study Service Retrieve transaction URI is formed from hostname, port, and endpoint path of the RESTful service of the responder, as follows:

`<hostname[:port]>/<endpoint path>/`

The `<resource>` component is formed from appropriate resource UIDs depending on the resource being retrieved as well as the type of the resource.

520 X.4.2 Use Cases

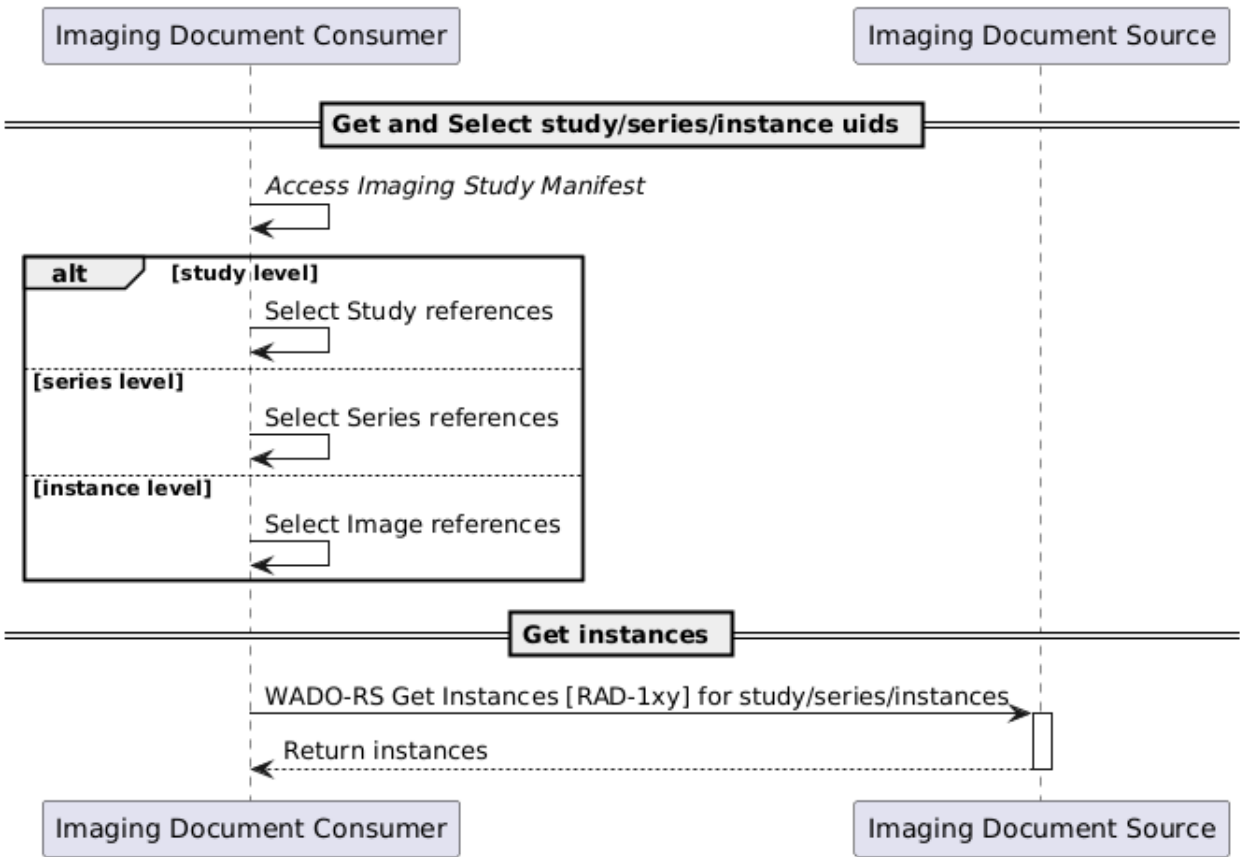
X.4.2.1 Use Case #1: DICOM Instance Retrieval

X.4.2.1.1 Instance Retrieval Use Case Description

The Manifest-Based Access to DICOM Objects corresponds to a subset of a broader use case scenario from the user perspective.

- 525 • A system acting as an imaging document consumer has access to imaging study manifests (the way manifests are accessed and exchanged is out of scope of the use case).
- A user on this system uses the content of any such imaging study manifest to choose an entire imaging study or a subset (series, set of instances, key images).
- 530 • The imaging document consumer requests the retrieval of these selected DICOM instances from the remote imaging sources using the location information provided in the imaging study manifest.
- This request retrieval is received by an imaging source and the corresponding DICOM instances are accessed from its internal storage and returned to the requesting
535 imaging document consumer.
- The imaging document consumer receives the DICOM Instances, in the format requested, and processes them.

X.4.2.1.2 Instance Retrieval Process Flow



540 **Figure X.4.2.2-1: Basic Process Flow in MADO Profile**

The text in Figure X.4.2.2-2 was used to generate the diagram in Figure X.4.2.2-1. Readers will generally find the diagram more informative. The text is included here to facilitate editing.

```
545 @startuml Basic Process Flow in MADO
    participant "Imaging Document Consumer" as IDC
    participant "Imaging Document Source" as IDS
    == Get and Select study/series/instance uids ==
    IDC->>IDC: //Access Imaging Study Manifest//
    alt study level
    550 IDC->>IDC: Select Study references
    else series level
    IDC->>IDC: Select Series references
    else instance level
    555 IDC->>IDC: Select Image references
    end
    == Get instances ==
    IDC->>IDS: WADO-RS Get Instances [RAD-1xy] for study/series/instances
    activate IDS
    IDS-->>IDC: Return instances
```

560

```
deactivate IDS
@enduml
```

Figure X.4.2.2-2: Basic Process Flow in MADO Profile Pseudocode

X.4.1.2.1 Pre-conditions

- Imaging Study Manifest is accessible by Imaging Document Consumer.
- Relevant DICOM instances have been selected from the Imaging Study Manifest.

565

X.4.1.2.2 Main Flow

Imaging Document Consumer *wants to retrieve the studies referenced in the Imaging Study Manifests:*

570

- The Imaging Document Consumer initiates a WADO-RS Get Instances [RAD-1xy] request to the Imaging Document Source to get the selected DICOM instances.
- Remote Imaging Document Source accesses the requested DICOM instances and generates the response to the inbound WADO-RS Retrieve [RAD-1xy] request from the Imaging Document Consumer. The response contains either requested DICOM instances or an error code indicating that some or all requested instances are not accessible.

X.4.1.2.3 Post-conditions

575

- DICOM instances are available in the Imaging Document Consumer for processing.

X.5 MADO Security Considerations

580

The MADO Profile has similar security considerations to other IHE profiles that are based on HTTP or REST. See [ITI TF-2: Appendix Z.8](#) for recommendations for secure transportation, authentication, authorization, and securing patient identifiers in URLs. Implementers are encouraged to review that section for applicability to their product environment.

Implementers may also consider implementing Cross-Origin Resource Sharing (CORS) (<https://www.w3.org/TR/cors/>) support to allow browser-based clients to retrieve information from distributed sources (for example, queries are performed on server A, and instances are downloaded from server B).

585

Deployments should consider whether or not:

590

- The Imaging Document Consumer performs user authentication to access patient data.
- The Imaging Document Source use credentials or tokens supplied by the Imaging Document Consumer in the WADO-RS Retrieve transaction.
- The Imaging Document Consumer or the Imaging Document Source (or both) records access in an audit log.

This profile does not define how the Imaging Document Consumer supplies credentials to the **Imaging Document Source** to provide the user with a seamless "single sign-on" experience. The HTTP GET URL transaction allows for a range of authentication mechanisms, including use of mTLS authentication, digest authentication, client certificate-based authentication, provision of a SAML assertion in an authentication header, or other mechanisms suitable for stateless atomic transactions. **Does this make sense for MADO?**

The user authentication and authorization methods are outside the scope of the MADO Profile. Implementers should consider implementing the IHE ITI Profile such as [Internet User Authorization](#) (IUA).

Implementations should also consider how availability and integrity will be protected, including intentional attacks such as maliciously crafted queries that interfere with service availability.

The WADO-RS transactions may include in their response a URL specifying where the corresponding instances can be retrieved. In the absence of protection, such as TLS, a malicious attacker may intercept the response and rewrite these URLs to a location of suspect origin. An Imaging Document Consumer should verify that any received URL is valid and corresponds to a known secure location.

The security considerations for a content module are dependent upon the security provisions defined by the grouped actor(s).

X.6 MADO Cross Profile Considerations

The table below describes some optional groupings in other related profiles.

| MADO Actor | Actor(s) may be grouped with | Reference | Content Bindings Reference |
|------------------|--|--|----------------------------|
| Content Consumer | ITI XDS.b / Document Consumer OR ITI MHD / Document Consumer (see Note 1) | ITI TF-1: 10.1 ITI TF-1: 33 | ? |
| Content Creator | ITI XDS.b / Document Consumer OR ITI MHD / Document Consumer (see Note 1) | ITI TF-1: 10.1 ITI TF-1: 33 | |
| | ITI CT / Time Client | ITI TF-1: 7.1 | |
| | ITI ATNA / Secure Node or Secure Application | ITI TF-1: 9.1 | |

Appendices to Volume 1

Not applicable.

- 615 *<Add appendices to Volume 1 for this profile here. Examples of an appendix include HITSP mapping to IHE Use Cases or long use case definitions.>*
- <If there are no Volume 1 appendices, enter “Not applicable” and delete the Appendix A and Appendix B placeholder sections.>*
- 620 *<Volume 1 appendices are informational only. No “SHALL” language is allowed in a Volume 1 appendix.>*

Appendix A – <Appendix Title>

Appendix A text.

A.1 <Title>

625 Appendix A.1 text.

A.1.1 <Title>

Appendix A.1.1 text.

Volume 2 – Transactions

Add Section 3.Y

630 3.1xy WADO-RS Get Instances [RAD-1xy]

3.1xy.1 Scope

This transaction is used to <...describe what is accomplished by using the transaction. Remember that by keeping transactions general/abstract, they can be re-used in a variety of profiles>

635 3.1xy.2 Actor Roles

Table 3.1xy.2-1: Actor Roles

| | |
|------------------|---|
| Role: | Requester: Submit retrieve DICOM instance requests |
| Actor(s): | The following actor plays the role of Requester: Imaging Document Consumer |
| Role: | Responder: Returns the requested DICOM instance |
| Actor(s): | The following actor plays the role of Responder: Imaging Document Source |

Transaction text specifies behavior for each role. The behavior of specific actors may also be specified when it goes beyond that of the general role.

640 3.1xy.3 Referenced Standards

- RFC1738 Uniform Resource Locators (URL), <http://www.ietf.org/rfc/rfc1738.txt>
- RFC2616 HyperText Transfer Protocol HTTP/1.1, <http://www.ietf.org/rfc/rfc2616.txt>
- RFC7540 Hypertext Transfer Protocol Version 2 (HTTP/2), <https://tools.ietf.org/html/rfc7540>
- RFC4627 The application/json Media Type for JavaScript Object Notation (JSON), <http://www.ietf.org/rfc/rfc4627.txt>
- Extensible Markup Language (XML) 1.0 (Second Edition). W3C Recommendation 6 October 2000, <http://www.w3.org/TR/REC-xml>

650

- DICOM [PS3.18 Section 10.4](#): Web Services – Retrieve Transaction of the DICOM Studies Service
- DICOM [PS3.18 Annex F](#): DICOM JSON Model
- DICOM [PS3.19 Annex A.1](#): Native DICOM Model
- DICOM [PS3.19 Annex B](#): Interfaces Definition (WSDL and Schema)

3.1xy.4 Messages

655

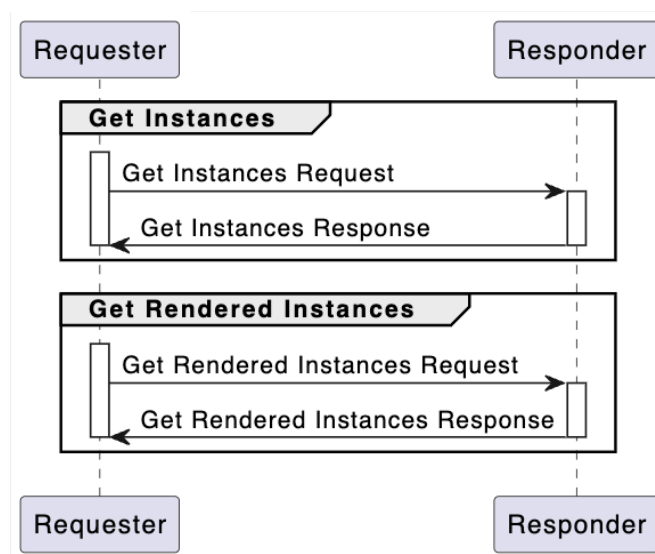


Figure 3.1xy.4-1: Interaction Diagram

This transaction defines request/response message pairs:

660

- Get Instances (Section x.x.4.1 and x.x.4.2),
- Get Rendered Instances (Section x.x.4.3 and x.x.4.4).

A Requester and a Responder shall support Get Instances request/response message pair as defined in DICOM. They may optionally implement Get Rendered Instances request/response message pair as defined in DICOM.

3.1xy.4.1 Get Instances Request Message

665

The Requester retrieves one or more DICOM instances from the Responder.

3.1xy.4.1.1 Trigger Events

The Requester wishes to retrieve DICOM instances.

3.1xy.4.1.2 Message Semantics

670 The Get Instances Request message is a Retrieve transaction of the DICOM Studies Service. See DICOM [PS3.18 Section 10.4](#).

The Requester is the User Agent, and the Responder is the Origin Server.

The message shall correspond to one of the Instance Resources in Table 3.1xy.4.1.2-1.

Table 3.1xy.4.1.2-1: Retrieve Transaction Instance Resources

| Resource | Reference |
|----------|---|
| Study | DICOM PS3.18 Section 10.4.1.1.1 |
| Series | |
| Instance | |

675 Although DICOM also includes the Frame Pixel Data resource, it is not required for this transaction.

Imaging Document Consumers acting as Requester should consider replacing a study level requests by issuing multiple series level requests in order to improve overall performance.

The HTTP Request URI for the DICOMweb Retrieve Transaction of the Studies Service is formed from the `<protocol>` component, `<endpoint>` component, `<resource>` component.

- 680
- The value of the `<protocol>` component shall be set to `https://`.
 - The `<endpoint>` component of DICOMweb Study Service Retrieve transaction URI is formed from hostname, port, and endpoint path of the RESTful service of the responder, as follows: `<hostname[:port]>/<endpoint path>/`.
 - The `<resource>` component is formed from appropriate resource UIDs depending on the resource being retrieved as well as the type of the resource. The value of the `<resource>` component shall be formatted as specified in the definition of the WADO-RS Get Instances [RAD-1xy] transaction. See RAD-TF2: 4.1xy.4.3
- 685

3.1xy.4.1.2.1 Example of a Get Instances Request message

690 The following is an example of an HTTP Request URI for retrieving a composite DICOM Instance. This example uses an Accept header to request the DICOM Instance returned in the Native DICOM binary format.

695

```
https://www.imaging-document-source.org/  
studies/2.999.1.59.40211.12345678.678910/series/2.999.1.59.40211.789001  
276.14556172.67789/instances/2.999.1.59.40211.2678810.87991027.899772.2  
Accept: multipart/related; type=application/dicom
```

3.1xy.4.1.3 Expected Actions

705 The Responder shall parse the request and redirect it to a destination from which the appropriate representation of the Resource in the Selected Media Type (see DICOM [PS3.18 Section 10.4.2](#)) shall be retrieved, and return a response as described in Section 4.160.4.2.

3.1xy.4.2 Get Instances Response Message

The Responder reports the outcome of the Get Instances Request Message.

705 **3.1xy.4.2.1 Trigger Events**

The Responder completes the processing of the Get Instances Request Message and receives complete or partial response from the destination it forwarded the request to.

3.1xy.4.2.2 Message Semantics

710 The message is a Response to a Retrieve Transaction as specified in DICOM [PS3.18 Section 10.4.3](#).

The Requester is the User Agent, and the Responder is the Origin Server.

The Responder shall provide a response as described in Table 3.1xy.4.2.2-1.

Table 3.1xy.4.2.2-1: Response Message Semantics

| Resource | Reference |
|----------|---|
| Study | DICOM PS3.18 Section 10.4.3.1 |
| Series | |
| Instance | |

715 The Responder shall provide a response message header containing the appropriate status code indicating success, warning, or failure as described in DICOM [PS3.18 Section 10.4.3.1](#).

3.1xy.4.2.3 Expected Actions

The Requester shall accept the response.

720 The Requester shall follow redirects (responses with values of 301, 302, 303 or 307. See <https://tools.ietf.org/html/rfc7231#section-6.4> for details) unless a loop or security policy violation is detected.

3.1xy.4.3 Get Rendered Instances Request Message

The Requester retrieves one or more representations of a DICOM Resource, rendered as appropriate images or other representations, from the Responder.

725 **3.1xy.4.3.1 Trigger Events**

The Requester wishes to retrieve rendered instances.

3.1xy.4.3.2 Message Semantics

The Get Rendered Instances Request message is a Retrieve transaction of the DICOM Studies Service. See DICOM [PS3.18 Section 10.4](#).

730 The Requester is the User Agent, and the Responder is the Origin Server.

The message shall correspond to one of the Instance Resources in Table 3.1xy.4.3.2-1.

Table 3.1xy.4.3.2-1: Retrieve Transaction Instance Resources

| Resource | Reference |
|-------------------|---|
| Rendered Instance | DICOM PS3.18 Section 10.4.1.1.3 |

Although DICOM also includes the Rendered Study, Rendered Series, and Rendered Frame Pixel Data resource, it is not required for this transaction.

735 The HTTP Request URI for the DICOMweb Retrieve Transaction of the Studies Service is formed from the <protocol> component, <endpoint> component, <resource> component.

- The value of the <protocol> component shall be set to https://.
- The <endpoint> component of DICOMweb Study Service Retrieve transaction URI is formed from hostname, port, and endpoint path of the RESTful service of the responder,
740 as follows: <hostname[:port]>/<endpoint path>/.
- The <resource> component is formed from appropriate resource UIDs depending on the resource being retrieved as well as the type of the resource. The value of the <resource> component shall be formatted as specified in the definition of the WADO-RS Get Instances [RAD-1xy] transaction. See RAD-TF2: 4.1xy.4.3

745

3.1xy.4.3.2.1 Example of a Get Instances Request message

The following is an example of an HTTP Request URI for retrieving a rendered composite DICOM Instance. This example uses an Accept header to request the DICOM Instance returned in the JPEG format.

750

```
https://www.imaging-document-source.org/  
studies/2.999.1.59.40211.12345678.678910/series/2.999.1.59.40211.789001  
276.14556172.67789/instances/2.999.1.59.40211.2678810.87991027.899772.2  
/rendered  
Accept: multipart/related; type=image/jpeg
```


755 **3.1xy.4.3.3 Expected Actions**

The Responder shall parse the request and redirect it to a destination from which the appropriate representation of the Resource in the Selected Media Type (see DICOM [PS3.18 Section 10.4.2](#)) shall be retrieved, and return a response as described in Section 4.160.4.2.

760 The Responder is not expected to prepare the rendered instances but rather to request that to be prepared by the destination.

3.1xy.4.4 Get Rendered Instances Response Message

The Responder reports the outcome of the Get Rendered Instances Request Message.

3.1xy.4.4.1 Trigger Events

765 The Responder completes the processing of the Get Instances Request Message and receives a complete or partial response from the destination it forwarded the request to.

3.1xy.4.4.2 Message Semantics

The message is a Response to a Retrieve Transaction as specified in DICOM [PS3.18 Section 10.4.3](#).

770 The Requester is the User Agent, and the Responder is the Origin Server.

The Responder shall provide a response as described in Table 3.1xy.4.2.2-1.

Table 3.1xy.4.4.2-1: Response Message Semantics

| Resource | Reference |
|-------------------|---|
| Rendered Instance | DICOM PS3.18 Section 10.4.3.3 |

The Responder shall provide a response message header containing the appropriate status code indicating success, warning, or failure as described in DICOM [PS3.18 Section 10.4.3.1](#).

775 **3.1xy.4.4.3 Expected Actions**

The Requester shall accept the response.

The Requester shall follow redirects (responses with values of 301, 302, 303 or 307. See <https://tools.ietf.org/html/rfc7231#section-6.4> for details) unless a loop or security policy violation is detected.

780 **3.1xy.5 Protocol Requirements**

<In this section, the selected protocol bindings of the transactions are explained in detail (like SOAP or HTTP bindings). For an example, see the QRPH DEX Profile or ITI TF-2b:3.34.5, 3.35.5. Indicate NA if not used.>

3.1xy.6 Security Considerations

785 Additional security considerations that may apply are discussed in RAD TF-1: X.5 – MADO Security Considerations. – **check reference**

3.1xy.6.1 Security Audit Considerations

790 The [Radiology Audit Trail Option](#) in the ITI Audit Trail and Node Authentication (ATNA) Profile ([ITI TF-1: 9](#)) defines audit requirements for IHE Radiology transactions. See RAD TF-3:5.1.

3.1xy.6.(z) <Actor> Specific Security Considerations

<This section should specify any specific security considerations on an actor-by-actor basis.>

Appendices to Volume 2

795 Not applicable.

<Detailed cross transaction relationships or mapping details are described in an appendix in Volume 2x. Volume 2 appendices may be informational or normative. Immediately after the title of a Volume 2 appendix, provide a very explicit statement defining whether this new appendix is informative or normative.

800 *If there are no Volume 2 appendices, enter “Not applicable” and delete the Appendix A and Appendix B placeholder sections.>*

Volume 3 – Content Modules

5 IHE Namespaces, Concept Domains and Vocabularies

| |
|--|
| <i>Add to Section 5 IHE Namespaces, Concept Domains and Vocabularies</i> |
|--|

5.1 IHE MADO Namespaces

- 810 <**For Public Comment publication**, please explicitly identify all **new** *OIDs, UIDs, URNs, etc.*, defined specifically for this profile. These items should be collected from the sections within this supplement and listed here as additions to the applicable domain *OID Registry*. The tables within this section will be deleted prior to inclusion into the *Technical Framework as Final Text*, but should be present for publication for *Public Comment*.>
- 815 <**For Trial Implementation publication**, the domain technical committee **must** ensure that all new *OIDs, UIDs, URNs, etc.*, defined specifically for this profile (and listed here for public comment publication have now been recorded in their *OID Registry*. The tables within this section will be deleted prior to inclusion into the *Technical Framework Volumes as Final Text* but should be present for publication for *Trial Implementation*.>
- 820 <Ensure the domain's registry of *OIDs* is linked to from the following wiki page. It may be another wiki page, a document on *IHE Google Drive*, etc.>

The <domain name> registry of *OIDs* is located at
http://wiki.ihe.net/index.php/OID_Registration#IHE_Domain_Namespaces

- 825 Additions to the <Domain Name> *OID Registry* are:

| codeSystem | codeSystemName | Description |
|--------------|--------------------|---|
| <oid or uid> | <code system name> | <short description or pointer to more detailed description> |
| <oid or uid> | <code system name> | <short description or pointer to more detailed description> |
| <oid or uid> | <code system name> | <short description or pointer to more detailed description> |

5.2 IHE MADO Concept Domains

- 830 <*Concept Domains* are named categories of things that are used when it isn't possible to bind to a specific set of codes. There are a number of reasons you might not be able to define and bind to a specific set of codes, one of the most common being that the codes set needs to vary depending on locale or context.>

For a listing of the <Domain Name> Concept Domains see *<enter location of the domains Concept Domains or NA if none>*

| conceptDomain | conceptDomainName | Description |
|---------------|--------------------|---|
| <oid or uid> | <code system name> | <short description or pointer to more detailed description> |
| <oid or uid> | <code system name> | <short description or pointer to more detailed description> |
| <oid or uid> | <code system name> | <short description or pointer to more detailed description> |

5.3 IHE MADO Format Codes and Vocabularies

5.3.1 IHE Format Codes

List in the table below any **new** format codes to be added to the IHE Format Codes wiki page at http://wiki.ihe.net/index.php/IHE_Format_Codes. For public comment, the additions must be listed in the table below. The domain technical committee must ensure any new codes are also added to the wiki page prior to publication for trial implementation.

| Profile | Format Code | Media Type | Template ID |
|---|-------------|------------|-------------|
| Manifest Based Access to DICOM Objects (MADO) | <urn:ihe: > | | <oids> |
| | | | |
| | | | |

5.3.2 IHEActCode Vocabulary

List in the table below, any **new** additions to the IHEActCode Vocabulary wiki page at http://wiki.ihe.net/index.php/IHEActCode_Vocabulary. For public comment, the additions must be listed in the table below. The domain technical committee must ensure any new codes are also added to the wiki page prior to publication for trial implementation.

| Code | Description |
|-------------|---|
| <Code name> | <short one sentence description or reference to longer description (not preferred)> |
| <Code name> | <short one sentence description or reference to longer description (not preferred)> |

| | |
|-------------|---|
| <Code name> | <short one sentence description or reference to longer description (not preferred)> |
|-------------|---|

5.3.3 IHERoleCode Vocabulary

855

List in the table below any **new** additions to the IHERoleCode Vocabulary wiki page at http://wiki.ihe.net/index.php/IHERoleCode_Vocabulary. For public comment, the additions must be listed in the table below. The domain technical committee must ensure any new codes are also added to the wiki page prior to publication for trial implementation.

860

| Code | Description |
|----------------|--|
| <name of role> | <Short, one sentence description of role or reference to more info.> |
| <name of role> | <Short, one sentence description of role or reference to more info.> |
| <name of role> | <Short, one sentence description of role or reference to more info.> |

5.3.4 Imaging Study Manifest Search Metadata

865

List in the table below search parameters in document sharing queries request and responses associated with the imaging study manifest.

870 7 MADO DICOM Content Definitions

DICOM Content Definitions constrain the use of instances of specific DICOM IODs (also referred to as DICOM objects). This typically means placing requirements on the creators of those instances, although requirements may also be placed on the receivers and users.

The most common such requirements are to:

- 875
 - Make a module that is optional (U) in a DICOM IOD be required or conditional,
 - Make an attribute that is optional (Type 3) in a DICOM Module be required or conditional,
 - Require that an attribute that is optional (Type 3) in a DICOM Module be absent
 - Constrain the content of an attribute to be empty
- 880
 - Constrain the content of an attribute to be populated in a certain way, such as:
 - Constraining the value to be taken from a specific table
 - Constraining the value to be copied from a specific source
 - Constraining the value to encode certain information
 - Require that an attribute be displayed/accessible to the operator
- 885 Reiterating DICOM requirements is kept to a minimum sufficient to provide context for the IHE requirements. Implementers are still required to be familiar with, and conform to, the underlying DICOM specification.

Content Definitions may be referenced from a Profile independent of transactions to constrain content without specifying the transport. Content Definitions may also be referenced from within a Transaction specification to constrain the content without duplicating the same constraint text across multiple related transactions.

890

For attributes that are optional, the creator is permitted but not required to include them, and the receiver is permitted but not required to ignore them.

7.1 Conventions

895 DICOM Conventions are defined in [Appendix E](#) to the *IHE Technical Frameworks General Introduction*.

Table 7.1.2-1: Usage of DICOM Modules in IHE

| | |
|-----------|---|
| M / C / U | As defined in DICOM PS 3.3 |
| R | The Module is defined as Conditional (C) or User Option (U) in DICOM. The Requirement is an IHE extension of the DICOM requirements, and the module shall be present. |

| | |
|----|---|
| RC | The Module is defined as Conditional (C) or User Option (U) in DICOM. The Requirement is an IHE extension of the DICOM requirements, and the module shall be present when the specified conditions apply. |
|----|---|

Table 7.1.2-2: Usage of DICOM Attributes in IHE

| | |
|-----|--|
| O | The attribute or its value is optional, i.e., in DICOM it is Type 2 or 3. |
| O+* | The attribute is optional, but additional constraints have been added. Note: The specification approach does not force a Type 2 or Type 3 value to become a Type 1 by stating O+. |
| R | The attribute is required, and is not an IHE extension of the DICOM requirements; i.e., it is already Type 1 in DICOM, but additional constraints are placed by IHE, for example on the value set that may be used for the attribute. |
| R+ | The Requirement is an IHE extension of the DICOM requirements, and the attribute shall be present, i.e., is Type 1, whereas the DICOM requirement may be Type 2 or 3. |
| RC+ | The Requirement is an IHE extension of the DICOM requirements, and the attribute shall be present when the condition is satisfied, i.e., is Type 1C, whereas the DICOM requirement may be Type 2 or 3. If the condition is not fulfilled, the DICOM definitions apply. Note, that this means that the attribute may be present / have a value also in case the condition does not apply. |
| D | The requirements of DICOM apply unchanged, but the attribute needs to be displayed. |
| - | No IHE extension of the DICOM requirements is defined. The attribute is listed for better readability or similar purpose. |
| X+ | <u>The attribute information is required to be absent. DICOM Type 2 attributes shall be present with no value. DICOM Type 3 attributes shall be absent.</u> |

900 7.1.1 DICOM Structured Report

Conventions for constraining instances of DICOM Structured Reports as IHE Content Definitions are not yet worked out. In many cases, requiring the use of a specific DICOM SR Template may be sufficient.

7.1.2 Display Requirements

905 If a requirement lists *, then that attribute is not required to be displayed.

7.2 General Definitions

None.

7.3 IOD Definitions

910 This section contains DICOM IOD specifications referenced in profiles of the IHE MADO domain, specifying the parts of the DICOM Standard used and the extended IHE requirements.

7.3.1 Key Object Selection Document IODs

<An appropriate section structure should be established to group the specifications along the needs to the domain.>

7.3.1.1 Key Object Selection Document IOD

915 *<This section contains the definitions of the DICOM IOD listed in the title. The DICOM IOD Name shall match the name used in the DICOM Standard.>*

7.3.1.1.1 Key Object Selection Document IOD <Use Case Context>

920 *<The same IOD may be used in different use case context. This section defines the requirements for an IOD in the context indicated in the title. The same IOD may have different requirements in another context>*

7.3.1.1.1.1 Referenced Standards

- DICOM 2025c PS 3.3: A.35.4 Key Object Selection Document IOD

7.3.1.1.1.2 IOD Definition

Table 7.3.1.1.1.2-1: Usage of DICOM Modules in IHE

| IE | Module | Reference | Usage | IHE Usage |
|-------------|----------------------------|--------------------------|-------|----------------------------|
| Patient | Patient | C.7.1.1 | M | M See Section 7.4.1.1.1 |
| Study | General Study | C.7.2.1 | M | M See Section 7.4.1.2.1 |
| Series | Key Object Document Series | C.17.6.1 | M | M See Section 7.4.1.4.1 |
| Equipment | General Equipment | C.7.5.1 | M | M See Section 7.4.1.5.1 |
| SR Document | Key Object Document | C.17.6.2 | M | M See Section 7.4.3.1.1 |
| | SR Document Content | C.17.3 | M | M See Section 7.4.3.2.2 |
| | SOP Common | C.12.1 | M | M See Section 7.4.1.6.1 |

925

7.4 Module Definitions

This section contains DICOM Module specifications referenced in Section 7.3 IOD Definitions or otherwise in profiles of the IHE MADO domain, specifying the extended IHE requirements.

The following color coding is used in the module tables to highlight the attributes added to the standard KOS IOD.

| IHE Usage (Value Types) |
|--|
| Standard DICOM KOS IOD attribute Value Type. |
| Extension to DICOM KOS IOD. These extensions are based on the MCWG Extensions to Imaging Study Manifest recommendations. |

7.4.1 Key Object Selection Document Modules

7.4.1.1 Patient Module

7.4.1.1.1 Patient Module <Use Case Context>

<The same Module may be used in different use case context. This section defines the requirements for a Module in the context indicated in the title. The same Module may have different requirements in another context>

7.4.1.1.1.1 Referenced Standards

- DICOM 2025c PS 3.3: A.35.4 Key Object Selection Document IOD

7.4.1.1.1.2 Module Definition

Table 7.4.1.1.1.2-1: Usage of DICOM Attributes in IHE

| Excerpt from DICOM PS3.3 Table C.7-1 Patient Module © NEMA | | | |
|---|-------------|-----------|---|
| Attribute Name | Tag | IHE Usage | Attribute Description |
| Patient's Name | (0010,0010) | 2 | Patient's full name. |
| Patient ID | (0010,0020) | R+ | Primary identifier for the patient. Value: National Patient Id. |
| Issuer of Patient ID | (0010,0021) | 3 | Identifier of the Assigning Authority (system, organization, agency, or department) that issued the Patient ID. |

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| | | | |
|--|-------------|----|--|
| | | | If present should contain a label that corresponds to the authority identified by the Universal Entity ID (0010,0032) in the Issuer of Patient ID Qualifiers Sequence (0010,0024). |
| Issuer of Patient ID Qualifiers Sequence | (0010,0024) | R+ | Attributes specifying or qualifying the identity of the Issuer of the Patient ID (0010,0021), or scoping the Patient ID (0010,0020). Only a single Item shall be included in this Sequence. |
| > Universal Entity ID | (0010,0032) | R+ | Globally unique identifier (OID) for the Patient ID Assigning Authority. The authority identified by this attribute shall be the same as that labelled by the Issuer of Patient ID (0010,0021). |
| > Universal Entity ID Type | (0010,0033) | 1C | Standard defining the format of the Universal Entity ID. Required if Universal Entity ID (0010,0032) is present. Fixed value: "ISO" |
| > Type of Patient ID | (0010,0022) | 3 | The type of identifier in the Patient ID (0010,0020). Fixed value (if present): "TEXT" |
| Patient's Birth Date | (0010,0030) | 2 | Birth date of the patient. |
| Patient's Sex | (0010,0040) | 2 | Sex of the named patient. Enumerated Values: <ul style="list-style-type: none"> • "M" - male • "F" - female • "O" - other |
| Patient Comments | (0010,4000) | 3 | Used for national extensions (e.g. birth place) associated to patient demographics information used to validate the consistency between the patient ID and its demographic traits beyond sex, birth date, and names. |
| Other Patient IDs Sequence | (0010,1002) | R+ | A Sequence of identification numbers or codes used to identify the Patient, which may or may not be human readable, and may or may not have been obtained from an implanted or attached device such as an RFID or barcode. |

| | | | |
|--|-------------|----|--|
| | | | <p>One or more Items shall be included in this Sequence.</p> <p>Values: National, Regional and Local Patient Ids.</p> <p>Note: This attribute should provide a list of the national, regional and local patient identifiers. The local patient identifiers are those known in the imaging source at the time of the manifest creation.</p> |
| > Patient ID | (0010,0020) | 1 | An identifier for the Patient. |
| > Issuer of Patient ID | (0010,0021) | 3 | <p>Identifier of the Assigning Authority (system, organization, agency, or department) that issued the Patient ID (0010,0020).</p> <p>If present should contain a label that corresponds to the authority identified by the Universal Entity ID (0010,0032) in the Issuer of Patient ID Qualifiers Sequence (0010,0024).</p> |
| > Issuer of Patient ID Qualifiers Sequence | (0010,0024) | R+ | <p>Attributes specifying or qualifying the identity of the Issuer of the Patient ID (0010,0021), or scoping the Patient ID (0010,0020).</p> <p>Only a single Item shall be included in this Sequence.</p> |
| >> Universal Entity ID | (0010,0032) | R+ | <p>Globally unique identifier (OID) for the Patient ID Assigning Authority.</p> <p>The authority identified by this attribute shall be the same as that labelled by the Issuer of Patient ID (0010,0021).</p> |
| >> Universal Entity ID Type | (0010,0033) | 1C | <p>Standard defining the format of the Universal Entity ID. Required if Universal Entity ID (0040,0032) is present.</p> <p>Fixed value: “ISO”</p> |
| >> Type of Patient ID | (0010,0022) | 1 | <p>The type of identifier in the Patient ID (0010,0020) in this Item.</p> <p>Fixed value: “TEXT”</p> <p>Note: This attribute is mandatory (type 1) in this item.</p> |

7.4.1.2 General Study Module

7.4.1.2.1 General Study Module <Use Case Context>

<The same Module may be used in different use case context. This section defines the requirements for a Module in the context indicated in the title. The same Module may have different requirements in another context>

7.4.1.2.1.1 Referenced Standards

- DICOM 2025c PS 3.3: A.35.4 Key Object Selection Document IOD

7.4.1.2.1.2 Module Definition

Table 7.4.1.2.1.2-1: Usage of DICOM Attributes in IHE

| Excerpt from DICOM PS3.3 Table C.7-3 General Study Module © NEMA | | | |
|--|-------------|-----------|---|
| Attribute Name | Tag | IHE Usage | Attribute Description |
| Study Instance UID | (0020,000D) | 1 | Unique identifier for the Study. Copy of the referenced study's Study Instance UID (0020,000D). Note: There is a 1 to 1 relationship between this KOS manifest and the study that this KOS manifest references. |
| Study Date | (0008,0020) | R+ | Date the Study started. Note: The study date needs to be defined and, although Type 2 in the referenced imaging study, is by experience always quasi-present. |
| Study Time | (0008,0030) | 2 | Time the Study started. |
| Referring Physician's Name | (0008,0090) | 2 | Name of the Patient's referring physician. |
| Study ID | (0020,0010) | 2 | User or equipment generated Study identifier. |
| Accession Number | (0008,0050) | 2 | A departmental IS generated number that identifies the order for the Study. The Accession Number (0008,0050) is associated with a departmental IS (RIS) request. There is no departmental IS (RIS) |

| | | | |
|-------------------------------------|-------------|----|---|
| | | | request for a KOS manifest and so this attribute must be present with no value defined. Note: As there is a need to associate several RIS requests to a single study, the RIS request accession number(s) are placed in the Referenced Request Sequence (0040,A370). |
| Issuer of Accession Number Sequence | (0008,0051) | 2C | Identifier of the Assigning Authority that issued the Accession Number (0008,0050). A value shall be present. Only a single Item shall be included in this Sequence. |
| > Universal Entity ID | (0040,0032) | 1 | Globally unique identifier (OID) for the Accession Number (0008,0050) Assigning Authority. |
| > Universal Entity ID Type | (0040,003) | 1C | Standard defining the format of the Universal Entity ID. Required if Universal Entity ID (0040,0032) is present. Fixed value: “ISO” |
| Study Description | (0008,1030) | 3 | Institution-generated description or classification of the Study performed. |

7.4.1.3 Key Object Document Series Module

7.4.1.3.1 Key Object Document Series Module <Use Case Context>

<The same Module may be used in different use case context. This section defines the requirements for a Module in the context indicated in the title. The same Module may have different requirements in another context>

7.4.1.3.1.1 Referenced Standards

- DICOM 2025c PS 3.3: A.35.4 Key Object Selection Document IOD

7.4.1.3.1.2 Module Definition

Table 7.4.1.3.1.2-1: Usage of DICOM Attributes in IHE

Excerpt from **DICOM PS3.3 Table C.17.6-1 Key Object Document Series Module** © NEMA

| Attribute Name | Tag | IHE Usage | Attribute Description |
|--|--------------|-----------|--|
| Modality | (0008,0060) | 1 | Fixed value: “KO” |
| Series Instance UID | (0020,000E) | 1 | Unique Identifier for the Series. DICOM Series Instance UID assigned by KOS Manifest creator for the series where the KOS Manifest is placed. |
| Series Number | (0020,0011) | 1 | A number that is not already used by another series in the study that identifies the Series. Recommendation to assign a value of 59 if unused. |
| Series Date | (0008,0021) | 3 | Date the Series started. If the KOS Manifest is the first one assigned to a new series, the date value should be the same as the date of the KOS Manifest creation. |
| Series Time | (0008,0031) | 3 | Time the Series started. If the KOS Manifest is the first one assigned to a new series, the time value should be the same as the time of the KOS Manifest creation. |
| Referenced Performed Procedure Step Sequence | (0008, 1111) | 2 | Uniquely identifies the Performed Procedure Step SOP Instance for which the Series is created. No items shall be included in this Sequence. |

7.4.1.4 General Equipment Module

7.4.1.4.1 General Equipment Module <Use Case Context>

<The same Module may be used in different use case context. This section defines the requirements for a Module in the context indicated in the title. The same Module may have different requirements in another context>

7.4.1.4.1.1 Referenced Standards

- DICOM 2025c PS 3.3: A.35.4 Key Object Selection Document IOD

7.4.1.4.1.2 Module Definition

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Table 7.4.1.4.1.2-1: Usage of DICOM Attributes in IHE

| Excerpt from DICOM PS3.3 Table C.7-8 General Equipment Module © NEMA | | | |
|---|-------------|-----------|---|
| Attribute Name | Tag | IHE Usage | Attribute Description |
| Manufacturer | (0008,0070) | R+ | Manufacturer of the equipment that produced the KOS manifest. This attribute is required to facilitate the discovery of errors' sources in the creation of KOS Manifests. |
| Institution Name | (0008,0080) | R+ | Defines the institution that created the KOS manifest. This information is important to trace back any content error in a KOS Manifest. Fixed value configured onsite at install time of the software that created the KOS Manifests. Note: It is recommended by IHE MCWG to format this attribute according to the HL7 V2.5 XON data type so that it contains, in addition to the institution name, its globally unique identifier. This format is identical to the format of the authorInstitution Attribute of the MHD, XDS and XCA metadata. |
| Institution Code Sequence | (0008,0082) | RC+ | Institution or organization to which the identified individual is responsible or accountable. Required if Institution Name (0008,0080) is not present. May be present otherwise. Only a single Item shall be included in this Sequence. Note: It is recommended by IHE MCWG to format this attribute according to the HL7 V2.5 XON data type so that it contains, in addition to the institution name, its globally unique identifier. This format is identical to the format of the authorInstitution Attribute of the MHD, XDS and XCA metadata. |
| > Code Value | (0008,0100) | 1C | The identifier of the Coded Entry. |
| > Coding Scheme Designator | (0008,0102) | 1C | The identifier of the coding scheme in which the Coded Entry is defined. |

| | | | |
|----------------|-------------|---|---|
| > Code Meaning | (0008,0104) | 1 | Text that conveys the meaning of the Coded Entry. Conveys same value as would be in Institution Name (0008,0080) as coded entry. |
|----------------|-------------|---|---|

7.4.1.5 Key Object Document Module

7.4.1.5.1 Key Object Document Module <Use Case Context>

<The same Module may be used in different use case context. This section defines the requirements for a Module in the context indicated in the title. The same Module may have different requirements in another context>

7.4.1.5.1.1 Referenced Standards

- DICOM 2025c PS 3.3: A.35.4 Key Object Selection Document IOD

7.4.1.5.1.2 Module Definition

Table 7.4.1.5.1.2-1: Usage of DICOM Attributes in IHE

| Excerpt from DICOM PS3.3 Table C.17.6-2 Key Object Document Module © NEMA | | | |
|---|-------------|-----------|--|
| Attribute Name | Tag | IHE Usage | Attribute Description |
| Instance Number | (0020,0013) | 1 | A number that identifies the Document. |
| Content Date | (0008,0023) | 1 | The date the document content creation started. |
| Content Time | (0008,0033) | 1 | The time the document content creation started. |
| Referenced Request Sequence | (0040,A370) | 1C | Identifies Requested Procedures that are being fulfilled (completely or partially). This sequence will contain the same number of items as the number of unique combinations of accession numbers and order placer numbers associated with this Study . Each element shall have an Accession Number and an Order Placer Number corresponding to and associated with this Study. |

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| | | | |
|---|-------------|----|--|
| > Study Instance UID | (0020,000D) | 1 | <p>Unique Identifier for the Study.</p> <p>Copy of the referenced study's Study Instance UID (0020,000D).</p> <p>Note: There is a 1 to 1 relationship between this KOS manifest and the study that this KOS manifest references.</p> |
| > Referenced Study Sequence | (0008,1110) | 2 | <p>Uniquely identifies the Study SOP Instance.</p> <p>No items shall be included in this Sequence.</p> |
| > Accession Number | (0008,0050) | R+ | <p>A departmental IS generated number that identifies the imaging order for the Study. Shall contain a value associated with the Placer Order Number (0040,2016) in the sequence item.</p> |
| > Issuer of Accession Number Sequence | (0008,0051) | R+ | <p>Identifier of the Assigning Authority that issued the Accession Number (0008,0050). A value shall be present.</p> <p>Only a single Item shall be included in this Sequence.</p> |
| >> Universal Entity ID | (0010,0032) | R+ | <p>Globally unique identifier (OID) for the Accession Number (0008,0050) Assigning Authority.</p> |
| >> Universal Entity ID Type | (0010,0033) | 1C | <p>Standard defining the format of the Universal Entity ID. Required if Universal Entity ID (0040,0032) is present.</p> <p>Fixed value: "ISO"</p> |
| > Filler Order Number / Imaging Service Request | (0040,2017) | 2 | <p>The order number assigned to the Imaging Service Request by the party performing the order.</p> <p>This attribute may be empty. If a value is present it may be ignored.</p> |
| Requested Procedure ID | (0040,1001) | 2 | <p>This attribute may be empty. If a value is present it may be ignored.</p> |
| Requested Procedure Description | (0032,1060) | 2 | <p>This attribute may be empty. If a value is present it may be ignored.</p> |
| Requested Procedure Code Sequence | (0032,1064) | 2 | <p>A Sequence that conveys the requested procedure.</p> <p>Zero or more Items shall be included in this Sequence.</p> |

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| | | | |
|--|-------------|-----|--|
| > Placer Order Number / Imaging Service Request | (0040,2016) | 2 | The order number assigned to the Imaging Service Request by the party placing the order. Shall contain a value associated with the Accession Number (0008,0050) in the sequence item. |
| > Order Placer Identifier Sequence | (0040,0026) | RC+ | Identifier of the Assigning Authority that issued the Placer Order Number (0040,2016). Shall be present if Placer Order Number / Imaging Service Request (0040,2016) is not empty. Only a single Item shall be included in this Sequence. |
| >> Universal Entity ID | (0010,0032) | R+ | Globally unique identifier (OID) for the Placer Order Number (0040,2016) Assigning Authority. |
| >> Universal Entity ID Type | (0010,0033) | 1C | Standard defining the format of the Universal Entity ID. Required if Universal Entity ID (0040,0032) is present. Fixed value: “ISO” |
| Current Requested Procedure Evidence Sequence | (0040,A375) | 1 | List of all Composite SOP Instances references in Content Sequence (0040,A730), including all presentation states, real world value maps and other accompanying composite instances that are referenced from the content items. |
| > Study Instance UID | (0020,000D) | R | Unique identifier for the Study. Copy of the referenced study’s Study Instance UID (0020,000D). Note: There is a 1 to 1 relationship between this KOS manifest and the study that this KOS manifest references. |
| > Retrieve URI (IID use) Note: This is a suggested standard attribute to be used for this purpose. It may require a new more specific attribute to be added to DICOM. | (0040,E010) | RC+ | The value of this attribute is a Base URI representing the endpoint of a system supporting a study request type to launch server-side viewer using the IHE IID profile. The IID URL should then be composed by the Imaging Document Consumer using this Base URI and the Study Instance UID (0020,000D) from this manifest. |
| > Referenced Series Sequence | (0008,1115) | R | Sequence of Items where each item includes the Attributes of a Series containing referenced Composite Object(s) |

| | | | |
|--|-------------|-----|---|
| For each series in referenced PACS study { | | | |
| >> Series Date | (0008,0021) | RC+ | Date the Series started. Fallback to fill this value from an instance date of the first referenced image in the corresponding series within the imaging study. |
| >> Series Time | (0008,0031) | RC+ | Time the Series started. |
| >> Modality | (0008,0060) | R+ | Type of device, process or method that created the Instances in this Series. |
| >> Series Description | (0008,103E) | RC+ | Description of the Series. |
| >> Series Instance UID | (0020,000E) | R | Unique Identifier of a Series that is part of this Study and contains the referenced Composite Object(s) |
| >> Retrieve AE Title | (0008,0054) | RC+ | Title of the DICOM Application Entity where the Composite Object(s) may be retrieved on the network. This attribute may be present but shall be ignored. |
| >> Retrieve Location UID | (0040,E011) | R+ | Unique identifier of the system where the Composite Object(s) may be retrieved on the network. The value of this attribute is an OID that may be used as a reference to obtain the endpoint of the corresponding WADO-RS service returned as a Base URI. The WADO-RS retrieval URL should then be composed by the consumer using this Base URI and the study/series/instance UIDs of the resources selected for retrieval from this manifest. |
| >> Retrieve URL | (0008,1190) | O | URL specifying the location of the referenced Instance(s). The value of this attribute is a Base URI representing the endpoint for the corresponding WADO-RS service. The WADO-RS retrieval URL should then be composed by the consumer using this Base URI and the study/series/instance UIDs of the resources selected for retrieval from this manifest. |

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| | | | |
|--|-------------|-----|---|
| | | | Note: The definition of this Retrieve URL being a Base URI aligns with its use in the IHE XDS-I.b profile (DICOM Retrieve by WADO-RS option) and the IHE XC-WADO profile. |
| >> Referenced SOP Sequence | (0008,1199) | R | References to Composite Object SOP Class/SOP Instance pairs that are part of the Study defined by Study Instance UID and the Series defined by Series Instance UID (0020,000E). One or more Items shall be included in this Sequence. |
| For each instance in referenced PACS series { | | | |
| >>> Referenced SOP Class UID | (0008,1150) | R | Uniquely identifies the referenced SOP Class. |
| >>> Referenced SOP Instance UID | (0008,1155) | R | Uniquely identifies the referenced SOP Instance. |
| >>> Instance Number | (0020,0013) | RC+ | A number that identifies this SOP Instance. |
| >>> Number Of Frames | (0028,0008) | RC+ | Number of frames in a Multi-frame Image. Required if the instance contains multi-frame pixel data. |
| Significant Images – see “ Error! Reference source not found. ” (MCWG extension). Expresses the fact that the Reference SOP Instance is flagged by a KOS/KIN and links to the Referenced SOP Instance associated with the KOS/KIN instance that marks the SOP instance as being significant. | | | |
| >>> Related Series Sequence | (0008,1250) | RC+ | Sequence of Items identifying Series that contain a KOS/KIN marking the SOP Instance in this Item (of the enclosing Referenced SOP Sequence (0008,1199)) as being significant. Required if the SOP Instance in this Item (of the enclosing Referenced SOP Sequence (0008,1199)) is marked as significant in a KOS/KIN. One or more Items shall be present in this Sequence. Note: If multiple KOS/KIN tag a specific SOP Instance in a given study, those KOS/KIN may be assigned to the same series or to different series. |
| >>>> Series Instance UID | (0020,000E) | 1 | Series Instance UID of the series to which a KOS/KIN instance belongs. |

| | | | |
|--|-------------|----|---|
| | | | This attribute facilitates traversing the KOS Manifest through the series in which is located a KOS/KIN in the corresponding Reference SOP Sequence (0008,1199). This helps when accessing the content of the KOS/KIN comment, if any. |
| >>>> Referenced SOP Sequence | (0008,1199) | 1 | <p>The set of KOS/KIN SOP Instances in this Item of Related Series Sequence (0008,1250).</p> <p>One or more Items shall be included in this Sequence.</p> <p>Note: If multiple KOS/KIN tag a specific SOP Instance in a given study, those KOS/KIN may be assigned to the same series or to different series.</p> |
| >>>>> Referenced SOP Class UID | (0008,1150) | 1 | <p>SOP Class UID of the referenced KOS/KIN instance.</p> <p>Fixed value: KOS SOP Class UID.</p> |
| >>>>> Referenced SOP Instance UID | (0008,1155) | 1 | SOP Instance UID of the referenced KOS/KIN instance. |
| >>>>> Purpose of Reference Code Sequence | (0040,A170) | R+ | |
| >>>>>> Code Value | (0008,0100) | 1 | <p>Shall use the Code Value “113000” if this Item (of the enclosing Referenced SOP Sequence (0008,1199)) is flagged as a significant image.</p> <p>May use any other code value from BCID 7010.</p> |
| >>>>>> Coding Scheme Designator | (0008,0102) | 1 | <p>Identifier of the coding scheme in which the Code Value (0008,0100).</p> <p>DICOM coding scheme. Shall use a fixed value: Coding Scheme Designator “DCM”.</p> |
| >>>>>> Code Meaning | (0008,0104) | 1 | <p>Convey the code meaning as specified by BCID 7010.</p> <p>E.g., “Of Interest” for the code value “113000”.</p> |

| | | | |
|---|-------------|-----|---|
| Significant Images – see “ Error! Reference source not found. ” (MCWG extension). | | | |
| Add a copy of the comment (“Key Object Description”) in every reference to a KOS/KIN SOP instance that is used to flag one or more SOP instances. | | | |
| >>> Content Sequence | (0040,A730) | RC+ | Sequence of Text Values providing the Key Object Description of a KOS/KIN. Required if this Item (of the enclosing Referenced SOP Sequence (0008,1199)) references a KOS/KIN instance with a title code “Of Interest”. May be present if this Item (of the enclosing Referenced SOP Sequence (0008,1199)) references a KOS/KIN instance with a title code other than “Of Interest”. Zero or one Item shall be included in this Sequence. |
| >>>> Text Value | (0040,A160) | R+ | Contains the Concept Name (113012, DCM, "Key Object Description") Text Value copied from the KOS/KIN instance referenced. Non-formatted textual data, allowing for implementation specific display. This value may contain spaces as well as CR LF separators for one or more lines. |
| } | | | |
| } | | | |

7.4.1.6 SR Document Content Module

7.4.1.6.1 SR Document Module <Use Case Context>

985 *<The same Module may be used in different use case context. This section defines the requirements for a Module in the context indicated in the title. The same Module may have different requirements in another context>*

7.4.1.6.1.1 Referenced Standards

- DICOM 2025c PS 3.3: A.35.4 Key Object Selection Document IOD

7.4.1.6.1.2 Module Definition

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Table 7.4.1.6.1.2-1: Usage of DICOM Attributes in IHE

| Excerpt from DICOM PS3.3 Table C.17-4 SR Document Content Module © NEMA | | | |
|--|--------------------|-----------|---|
| Attribute Name | Tag | IHE Usage | Attribute Description |
| Value Type | (0040,A040) | 1 | Fixed value: “CONTAINER” |
| Concept Name Code Sequence | (0040,A043) | R+ | Code describing the concept represented by this Content Item. Also conveys the value of Document Title and section headings in documents. Required to indicate that this KOS instance is an imaging study manifest. Only a single Item shall be included in this Sequence. Use TID 2010 “Key Object Selection” to populate the remaining attribute values. Coded Document Title: (113030, DCM, Manifest) |
| > Code Value | (0008,0100) | 1 | Fixed value: “113030” |
| > Coding Scheme Designator | (0008,0102) | 1 | Fixed value: “DCM” |
| > Code Meaning | (0008,0104) | 1 | Fixed value: “Manifest” |
| Continuity of Content | (0040,A050) | 1 | Fixed value: “SEPARATE” |
| Content Template Sequence | (0040,A504) | 1 | Template that describes the content of this Content Item and its subsidiary Content Items. Only a single Item shall be included in this Sequence. |
| > Mapping Resource | (0008,0105) | 1 | Fixed value: “DCMR” |
| > Template Identifier | (0040,DB00) | 1 | Fixed value: “2010” |
| Content Sequence | (0040,A730) | R+ | A potentially recursively nested Sequence of Items that conveys content that is the Target of Relationships with the enclosing Source Content Item. |

| | | | |
|--|-------------|----|--|
| | | | One or more Items shall be included in this Sequence – each item is a reference to one of the instances in referenced study. |
| For each series in referenced study { | | | |
| For each instance in referenced series { | | | |
| > Relationship Type | (0040,A010) | 1 | Fixed value: “CONTAINS” |
| > Value Type | (0040,A040) | 1 | Fixed value (one of): “IMAGE”, “WAVEFORM” or “COMPOSITE”. Note: The Value Type depends on the SOP Class UID of the referenced object. |
| > Referenced SOP Sequence | (0008,1199) | R+ | References to Composite Object SOP Class Instance pairs. Only a single Item shall be included in this Sequence. |
| >> Referenced SOP Class UID | (0008,1150) | 1 | Uniquely identifies the referenced SOP Class. |
| >> Referenced SOP Instance UID | (0008,1155) | 1 | Uniquely identifies the referenced SOP Instance. |
| } | | | |
| } | | | |

7.4.1.7 SOP Common Module

7.4.1.7.1 SOP Common Module <Use Case Context>

995 *<The same Module may be used in different use case context. This section defines the requirements for a Module in the context indicated in the title. The same Module may have different requirements in another context>*

7.4.1.7.1.1 Referenced Standards

- DICOM 2025c PS 3.3: A.35.4 Key Object Selection Document IOD

7.4.1.7.1.2 Module Definition

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Table 7.4.1.7.1.2-1: Usage of DICOM Attributes in IHE

| Excerpt from DICOM PS3.3 Table C.12-1 SOP Common Module © NEMA | | | |
|---|-------------|-----------|---|
| Attribute Name | Tag | IHE Usage | Attribute Description |
| SOP Class UID | (0008,0016) | 1 | Uniquely identifies the SOP Class. |
| SOP Instance UID | (0008,0018) | 1 | Uniquely identifies the SOP Instance. |
| Specific Character Set | (0008,0005) | R+ | Character Set that expands or replaces the Basic Graphic Set. Required if an expanded or replacement character set is used. Preferred repertoires for use in Western and Eastern Europe: <ul style="list-style-type: none"> • “ISO-IR 100” - Latin alphabet No. 1 • “ISO-IR 101” - Latin alphabet No. 2 • “ISO-IR 144” - Cyrillic • “ISO-IR 126” – Greek • “ISO_IR 192” - Unicode in UTF-8 |
| Instance Creation date | (0008,0012) | 3 | Same as Study Date (0008,0020) |
| Instance Creation Time | (0008,0013) | 3 | Same as Study Time (0008,0030) |
| Timezone Offset From UTC | (0008,0201) | R+ | Contains the offset from UTC to the time zone for all DA and TM Attributes present in this SOP Instance, and for all DT Attributes present in this SOP Instance that do not contain an explicitly encoded time zone offset. |

8 MADO HL7 FHIR Content Definitions

1005 [Reference the HL7 FHIR Imaging Study Manifest IG in here \(somehow?\)](#)

9 MADO DICOM – FHIR Manifest Mapping Specification

Put the mapping spreadsheet contents in here (somehow?)

Appendices to Volume 3

Not applicable.

1010 <Add any applicable Volume 3 appendices below.

<If there are no Volume 3 appendices, enter “Not applicable” and delete the Appendix A and Appendix B placeholder sections.>

Appendix A – <Appendix Title>

Appendix A text.

1015 **A.1 <Title>**

Appendix A.1 text.

A.1.1 <Title>

Appendix A.1.1 text.

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