

Integrating the Healthcare Enterprise



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**IHE IT Infrastructure
Technical Framework Supplement**

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**Mobile access to Health Documents (MHD)
With XDS on FHIR**

HL7[®] FHIR[®] STU 3

Using Resources at FMM Levels 1-5

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Rev. 2.4 – Trial Implementation

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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.

Foreword

30 This is a supplement to the IHE IT Infrastructure Technical Framework V15.0. 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 July 24, 2018 for trial implementation and may be available for testing at subsequent IHE Connectathons. The supplement may be amended based on the results of testing. Following successful testing it will be incorporated into the IT Infrastructure
35 Technical Framework. Comments are invited and may be submitted at [http://www.ihe.net/ITI Public Comments](http://www.ihe.net/ITI_Public_Comments).

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.

40

<i>Amend Section X.X by the following:</i>
--

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.

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General information about IHE can be found at <http://ihe.net>.

Information about the IHE IT Infrastructure domain can be found at [http://ihe.net/IHE Domains](http://ihe.net/IHE_Domains).

Information about the organization of IHE Technical Frameworks and Supplements and the process used to create them can be found at http://ihe.net/IHE_Process and <http://ihe.net/Profiles>.

50 The current version of the IHE IT Infrastructure Technical Framework can be found at [http://ihe.net/Technical Frameworks](http://ihe.net/Technical_Frameworks).

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Introduction to this Supplement

Whenever possible, IHE profiles are based on established and stable underlying standards. However, if an IHE committee determines that an emerging standard offers significant benefits for the use cases it is attempting to address and has a high likelihood of industry adoption, it may develop IHE profiles and related specifications based on such a standard.

The IHE committee will take care to update and republish the IHE profile in question as the underlying standard evolves. Updates to the profile or its underlying standards may necessitate changes to product implementations and site deployments in order for them to remain interoperable and conformant with the profile in question.

This Technical Framework Supplement uses the emerging HL7^{®1} FHIR^{®2} specification. The FHIR release profiled in this supplement is STU 3. HL7 describes the STU (Standard for Trial Use) standardization state at <https://www.hl7.org/fhir/versions.html>.

In addition, HL7 provides a rating of the maturity of FHIR content based on the FHIR Maturity Model (FMM): level 0 (draft) through 5 (normative ballot ready). The FHIR Maturity Model is described at <http://hl7.org/fhir/versions.html#maturity>.

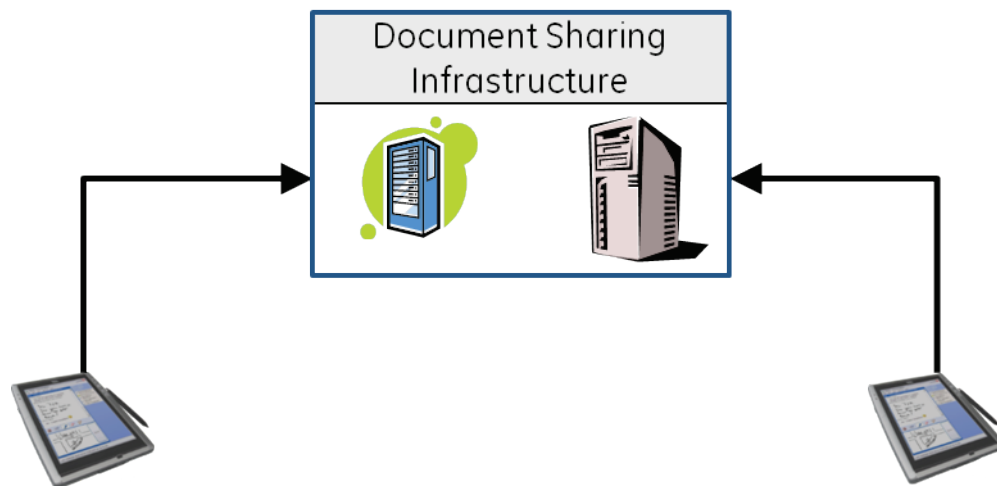
Key FHIR STU 3 content, such as Resources or ValueSets, used in this profile, and their FMM levels are:

FHIR Resource Name	FMM Level
Bundle	5
DocumentManifest	2
DocumentReference	3
List	1
OperationOutcome	5
Patient	5
Practitioner	3

¹ HL7 is the registered trademark of Health Level Seven International.

² FHIR is the registered trademark of Health Level Seven International.

160 The Mobile access to Health Documents (MHD) Profile defines one standardized interface to health documents (a.k.a. an Application Programming Interface (API)) for use by mobile devices so that deployment of mobile applications is more consistent and reusable. The transactions defined here leverage the document content- and format-agnostic metadata concepts from XDS but simplify them for access in constrained environments including mobile devices. The MHD Profile does not replace XDS. Mobile devices, and other resource-constrained systems, can use MHD to access to an XDS Repository. The following figure shows one possible way to
165 implement MHD within a document sharing environment (that may be, but is not necessarily, XDS-based). This implementation choice is not mandatory, and we recognize other architectures will be implemented.



170 **Figure 1: Mobile access to a Document Sharing environment.**

The XDS Profile has separated Document Registry and Document Repository to support the needs of Cross-Enterprise deployment architectures and enable robustness, security, privacy, and interoperability. The MHD Profile has simplified the interactions in ways that are more consistent with use within a single policy domain. MHD transactions are not specifically tied to
175 XDS; some of the system implementations envisioned may interface directly to an organizational EHR, or a multi-national PHR.

The MHD Profile supports a broad set of XDS use cases and functionality while keeping the technology as simple as possible. MHD focuses on a useful subset of the XDS use cases and does not try to reproduce the full scalability, flexibility, privacy, or security supported by the
180 more robust XDS infrastructure. The following are examples of environments which may choose the MHD Profile over the XDS Profile:

- Medical devices including those targeted by the IHE Patient Care Devices (PCD) domain or PCHA/Continua organization, submitting data in the form of documents.
- Kiosks used by patients in hospital registration departments.

- 185
- PHR publishing into a staging area for later import into an EHR or HIE.
 - Patient or provider applications that are configured to securely connect to a PHR to submit a medical history document (e.g., BlueButton+).
 - Electronic measurement devices participating in an XDW workflow and pulling medical history documents from an HIE.
- 190
- A General Practitioner physician’s office with minimal IT capabilities using a mobile application to connect to an HIE or EHR.

Open Issues and Questions

- 195
- MHD_036: There is a missing capability to fully represent XDS author in FHIR. This because FHIR DocumentReference and DocumentManifest only support ‘author’, not the other roles that could be supported in XDS. This author element precoordinates that the value is only the author. [GF#13266](#): DocumentReference and DocumentManifest author element needs to be more like Provenance.agent
 - MHD_038: Issue with how to carry CDA^{®3} root plus extension. We have documented current solution in Appendix Z– How to represent root+extension in a FHIR Identifier. However, FHIR should be more normative, so we have opened a CR http://gforge.hl7.org/gf/project/fhir/tracker/?action=TrackerItemEdit&tracker_item_id=13223
 - MHD_039: How important are Folders? We could support Document Source → Document Recipient ability to create and update Folders. To support Document Consumer → Document Responder support of folders would require adding another Transaction for Find Folders, or some other method that the Document Consumer obtains knowledge of the Folder (such as through _include). Are folders really important today, or have they been replaced by the ReferenceIdList?
 - MHD_042: MHD does not declare options for the various associations (replaces, transforms, appends), but rather provides the capability to all. Therefore, the Document Responder must be assumed to support all of these transforms. Is there a reason to bring those named options into MHD, or is this presumed capability sufficient?
 - MHD_043: Should ITI-68 be allowed to also act like a FHIR Binary endpoint? That is, it could return a Binary resource with the content contained if the Accept headers ask for FHIR types?
 - MHD_044: There is more detail in an XDS error on Provide and Register Document Set-b that is not obvious how to translate into the FHIR response [ITI-65]. Suggestions welcome.
- 200
- 205
- 210
- 215

³ CDA is the registered trademark of Health Level Seven International.

- 220 • MHD_047: Now that we have options for comprehensive vs non-comprehensive; should we have two profile tags. The profile as written indicates that <http://ihe.net/fhir/tag/iti-65> is always used. This should be resolved when we add FHIR conformance resources
- 225 • MHD_048: We have chosen to define some secondary resources as ‘contained’, which in FHIR means that they would not standalone, and thus would not be revisable. We chose this characteristic as the closest to XDS metadata principle. However, this means that these secondary resources would not be searchable.
- MHD_049: ProviderRole has been added to FHIR STU3, but not added to DocumentReference or DocumentManifest. This leaves a gap when using STU3. A FHIR CR 13266 has been submitted.
- 230 • MHD_050: Using FHIR List as a Folder is minimally supported. Should likely have a constant List.code that identifies those List resources that are Document Sharing Folders. This has not been completed as Folders are only minimally supported.
- 235 • MHD_051: More of the ITI-18 queries could be utilized with the addition of the identifier FHIR parameter, however this would then present combinations of query parameters at the MHD (FHIR) API that are not simple transforms to ITI-18 queries. For example, a Document Consumer provides both identifier query parameter, and another query parameter. At this time, MHD is focused on the most likely queries that a ‘mobile’ client would need, and these are satisfied with FindDocuments and FindSubmissionSets alone. Trial Implementation experience should be provided to IHE ITI Technical Committee in view of the need for other query parameters. Additional query parameters are allowed by MHD, they are simply not required of servers to do anything other than ignore the additional query parameters.
- 240

Closed Issues

- 245 • MHD_040: Find Document References does not support the GetRelatedDocuments stored query in the same way, but the queries provided can provide the same functionality.
- MHD_041: There is now a declared option to indicate a system that requires minimal metadata support. Therefore, a Document Source that uses minimal metadata may receive an error from a Document Recipient that does not support minimal metadata.
- 250 • MHD_037: STU3 now the Reference datatype can carry a URL to a Resource, or an Identifier of what could be a resource. We chose to specify use of URI and are silent on identifier until a compelling use case or issue appears.
- MHD_045: MHD scope is as a front API. Thus, it intends to be standalone, or as a front API to XDS/XCA/XDR. It therefore does not intend to support where XDS is the frontend API with MHD as the backend. The result is that MHD query model is a subset of XDS.
- 255

- MHD_046: MHD is an Interoperability Profile, and does not include systems design that would be necessary to efficiently implement. There is considerable room for creative systems design.
- 260 • MHD_001: Standards selection is now FHIR DSTU2. The profile restricts FHIR use to that which can be supported by an underlying XDS environment. The broad expectation is to use DocumentReference for DocumentEntry, DocumentManifest for SubmissionSet, and List for Folders. The inclusion of other FHIR resources as needed. The Provide Document Bundle is a bundle of the various resources necessary to be equivalent to the XDS Provide And Register Document Set-b [ITI-41]. The Find Document References will query on DocumentReference resources. The Find Document Manifests will query on DocumentManifest resources.
- 265 • MHD_002: Use of the IUA Profile is recommended, but not mandated as there are plenty of HTTP-based security models that layer in between the low-level transport (TCP) and the HTTP encoding. These security models can be layered in without modifying the characteristics of this profile. Use of TLS is encouraged, specifically as profiled in ATNA, but is not mandated. The IUA Profile includes guidance on the use of the current common implementations of OpenID Connect and OAuth 2.
- 270 • MHD_027: The Provide Document Bundle transaction allows for referencing the document content or including the document content. This is a capability not included in XDS for a Document Source, but is reasonable for a Document Recipient to implement. Does IHE need to define a Create Document type transaction so that the Document Source could publish before using references in the Provide Document Bundle Transaction? Resolution: there is expectation of supporting this in the future.
- 275 • MHD_031: This version of MHD supports Replace operations.
- 280 • MHD_032: This version of MHD supports other Association types.
- MHD_033: This version of MHD provides only minimal support for Folders. A Document Source can create Folders, and update Folders. A Document Responder can return Folders related to other queries. However, there is no defined method to search for Folders. Searching for Folders, as FHIR List resources, should be obvious.
- 285 • MHD_025: This version of MHD is based on HL7 FHIR DSTU2. Lessons learned were folded into HL7 FHIR for DSTU2 under a joint effort of IHE and HL7. Revisions of MHD are not expected to be backward compatible, until FHIR goes normative and MHD goes Final Text.
- 290 • MHD_026: DSTU2 has aligned the use of typeCode as DocumentReference.type, and classCode as DocumentReference.class.
- MHD_030: Include support for ReferenceIdList
- MHD_034: This version of MHD identifies sourcePatient and Author resources as contained within the DocumentReference, and DocumentManifest. As FHIR defines

295 ‘contained’ resources, these have no existence outside of their containment and are carried only within the original resource in which they were contained. This works well to support the XDS method of revision on DocumentEntry and SubmissionSet. This presents a conflict with the XDS Affinity Domain-managed Patient identity. We need experience on how to resolve.

- 300 • MHD_035: FHIR does not provide an ad-hoc metadata extension mechanism like custom slots in XDS.

Volume 1 – Profiles

305 *Add Section 33*

33 Mobile access to Health Documents (MHD) Profile

310 Applications specific to resource-constrained and mobile devices are an emerging platform for healthcare-enhancing software. The MHD Profile is not limited to mobile devices, using the term “mobile” only as a grouping for mobile applications, mobile devices or any other systems that are resource and platform-constrained. These constraints may drive the implementer to use simpler network interface technology. There are numerous deployed implementations of Document Sharing that need a simpler network interface technology, for example those hosted by a Health Information Exchange (HIE), large health provider electronic health record (EHR), or personal health record (PHR).

315 The Mobile access to Health Documents (MHD) Profile defines one standardized interface to health documents (a.k.a. an Application Programming Interface (API)) for use by mobile devices so that deployment of mobile applications is more consistent and reusable. In this context, mobile devices include tablets, smartphones, and embedded devices including home-health devices. This profile is also applicable to more capable systems where needs are simple, such as pulling the latest summary for display. The critical aspects of the ‘mobile device’ are that it is resource-constrained, has a simple programming environment (e.g., JSON, JavaScript), simple protocol stack (e.g., HTTP), and simple display functionality (e.g., HTML browser). The goal is, in part, to avoid burdening the client with additional libraries such as those that are necessary to process SOAP, WSSE, MIME-Multipart, MTOM/XOP, ebRIM, and multi-depth XML.

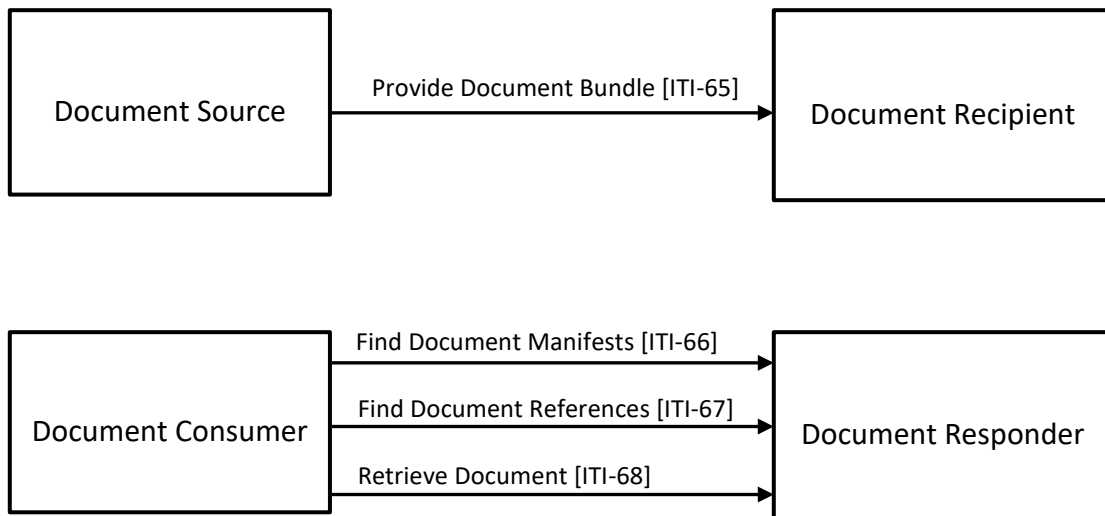
320 The Mobile access to Health Documents (MHD) Profile defines one pair of actors and a transaction to submit or push new “document entries” from the mobile device to a receiving system. Another set of actors and transactions is used to query a list of “document entries” having specific metadata, and to retrieve a document.

330 This profile leverages the metadata concepts from XDS, but simplifies the transaction requirements for access by mobile devices.

The MHD Profile does not replace XDS. Rather, it enables simplified access by mobile devices to an XDS (or a similar) document management environment containing health information.

33.1 MHD Actors, Transactions, and Content Modules

335 Figure 33.1-1 shows the actors directly involved in the MHD Profile and the relevant transactions between them.



340

Figure 33.1-1: MHD Actor Diagram

Table 33.1-1 lists the transactions for each actor directly involved in the MHD Profile. To claim support of this Profile, an implementation of an actor must perform the required transactions (labeled “R”) and may support the optional transactions (labeled “O”). Actor groupings are further described in Section 33.3.

345

Table 33.1-1: MHD - Actors and Transactions

Actors	Transactions	Optionality	Section in Vol. 2
Document Source	Provide Document Bundle [ITI-65]	R	ITI TF-2c: 3.65
Document Recipient	Provide Document Bundle [ITI-65]	R	ITI TF-2c: 3.65
Document Consumer	Find Document Manifests [ITI-66]	O (Note 1)	ITI TF-2c: 3.66
	Find Document References [ITI-67]	O (Note 1)	ITI TF-2c: 3.67
	Retrieve Document [ITI-68]	O (Note 1)	ITI TF-2c: 3.68
Document Responder	Find Document Manifests [ITI-66]	R	ITI TF-2c: 3.66
	Find Document References [ITI-67]	R	ITI TF-2c: 3.67
	Retrieve Document [ITI-68]	R	ITI TF-2c: 3.68

Note 1: Document Consumer shall implement at least one transaction: Find Document Manifests, Find Document References, or Retrieve Document.

33.1.1 Actor Descriptions and Actor Profile Requirements

350 Most requirements are documented in Transactions (Volume 2) and Content Modules (Volume 3). This section documents any additional requirements on profile’s actors.

The Document Source and Document Consumer Actors are designed so that they can be implemented on a mobile device, and yet have sufficient functionality to support a wide range of applications and use cases.

355 The Document Recipient and Document Responder Actors are expected to be implemented without the constraints of a mobile device.

The transactions used by the MHD Profile correspond to the following approximately equivalent transactions used by XDS.

MHD	XDS
Provide Document Bundle [ITI-65]	Provide and Register Document Set-b [ITI-41]
Find Document References [ITI-67]	Registry Stored Query – FindDocuments or FindDocumentsByReferenceId [ITI-18]
Find Document Manifests [ITI-66]	Registry Stored Query – FindSubmissionSets [ITI-18]
Retrieve Document [ITI-68]	Retrieve Document Set [ITI-43]

360 Note: The transaction names are pluralized, but the corresponding endpoints follow the FHIR convention of singular naming.

In the IHE XDS Profile, the Document Registry and Document Repository Actors are independent to enable the widest possible deployment architectures. For finding and retrieving documents, the MHD Document Responder is a single actor that supports both the Document Registry and Document Repository functionality. This eases configuration needs for mobile health applications and mobile health application deployment and reduces the overall solution complexity. The MHD Document Recipient and the MHD Document Responder Actors are separate actors because there are use cases where the functionality of only one is needed, such as supporting a mobile medical measuring device that simply creates and submits new documents.

370 General-purpose systems may implement both actors to offer a complete service definition for the hosting organization.

33.2 MHD Actor Options

Options that may be selected for this Profile are listed in the Table 33.2-1 along with the actors to which they apply. Dependencies between options when applicable are specified in notes.

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Table 33.2-1: MHD - Actors and Options

Actor	Options	Reference
Document Source	Comprehensive Metadata	Section 33.2.1
Document Recipient	Comprehensive Metadata	Section 33.2.1
	XDS on FHIR	Section 33.2.2
Document Consumer	No options defined	--

Actor	Options	Reference
Document Responder	XDS on FHIR	Section 33.2.2

33.2.1 Comprehensive Metadata Option

Support of this option assures that the Document Source will provide comprehensive metadata. Comprehensive metadata fulfill the cardinality requirements of XDS.

380 A Document Source that supports this option will provide metadata consistent with the additional document sharing requirements for an XDS Document Source described in ITI TF-3: 4.3.1- Submission Metadata Attribute Optionality.

385 A Document Recipient that supports this option will require that any metadata provided is consistent with the additional document sharing requirements for an XDS Document Source described in ITI TF-3: 4.3.1- Submission Metadata Attribute Optionality.

33.2.2 XDS on FHIR Option

The Document Recipient that supports this option shall be able to be grouped with an XDS Document Source so that any publication request is passed on to that XDS environment. See ITI TF-2c: 3.65.4.1.3 “Expected Actions” and ITI TF-2c: 3.65.4.1.3.1.

390 The Document Responder that supports this option shall be able to be grouped with an XDS Document Consumer so that any query or retrieve requests can be passed on to, and responded to, by an XDS environment. See ITI TF-2c: 3.66.4.1.3.1 and ITI TF-2c: 3.67.4.1.3.1.

33.3 MHD Actor Required Groupings

395 Actor(s) which are required to be grouped with another actor(s) are listed in this section. The grouped actor may be from this profile or a different domain/profile.

An actor from this profile (Column 1) must implement all the required transactions in this profile in addition to all of the required transactions for the grouped profile/actor listed (Column 3).

Table 33.3-1: MHD - Actors Required Grouping

MHD Actor	Grouping Condition	Actor(s) to be grouped with	Reference
Document Source	--	None	--
Document Recipient	XDS on FHR Option	XDS.b / Document Source	Section 33.2.2
Document Consumer		None	--
Document Responder	XDS on FHIR Option	XDS.b / Document Consumer	Section 33.2.2

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33.4 MHD Overview

405 The MHD Profile enables sharing of patient documents to, or from, mobile or constrained devices. Other IHE profiles, chiefly Cross-Enterprise Document Sharing (XDS), describe sharing of patient document in less constrained environments, and many of the concepts from those profiles are applicable to the MHD environment. For more information on IHE Document Sharing, see “Health Information Exchange: Enabling Document Sharing Using IHE Profiles” whitepaper.

33.4.1 Concepts

410 The MHD Profile supports a broad set of the XDS use cases and functionality while keeping the implementation as simple as possible. The MHD Profile is focused on a subset of the use cases that XDS supports and does not try to reproduce the full scalability, flexibility, privacy, or security supported by a more robust XDS infrastructure. Example use cases are:

- Medical devices such as those targeted by the IHE Patient Care Devices (PCD) domain, submitting data in the form of documents.
- 415 • Kiosks used by patients in hospital registration departments.
- PHR publishing into a staging area for later import into an EHR or HIE.
- Patient or provider applications that are configured to securely connect to a PHR in order to submit healthcare history document (e.g., BlueButton+).
- 420 • Electronic measurement devices participating in XDW workflows and pulling medical history documents from an HIE.
- A General Practitioner physician’s office with minimal IT capabilities using a mobile application to connect to an HIE or EHR.

425 These specific use cases can be generalized into two broad use cases. The first is the general use case of publishing new document(s) from the mobile device. The second general use case is where the mobile device needs to discover available documents and retrieve documents of interest. There are clearly complex use cases that combine these two general use cases; however, they are not specifically described in this profile. When more complex use cases are encountered, use of one of the more robust Document Sharing profiles is more appropriate.

33.4.2 Use Case #1: Publication of new documents

430 33.4.2.1 Publication of new documents Use Case description

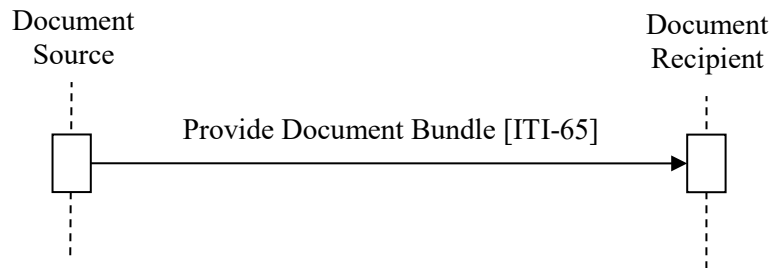
In this use case, a new document or set of documents is published from the mobile device. For example, a mobile device is a medical device that is submitting new health measurements, or a mobile device has a user-interface used to capture user input such as a Patient Consent. This device-created content is formed by the application, implementing the MHD Document Source, 435 into a Document and submitted with the metadata.

440 This use case presumes that the mobile device knows or discovers the patient identity. The patient identity might be obtained through some IHE transactional method such as the Patient Demographics Query for Mobile (PDQm) or Patient Identifier Cross-Reference for Mobile (PIXm) Profile. The patient id might simply be entered via some device interface (RFID, Bar-Code), a user interface, or be specified in a configuration setting (e.g., mobile PHR application). The use case also allows for identity cross-referencing to be implemented by the Document Recipient.

445 This use case presumes that the sending mobile device knows the location of the receiving URL endpoints, likely through a configuration setting, or through a workflow driven by a web interface.

33.4.2.2 Publication of new documents Process Flow

The publication of a new document(s) is done using the Provide Document Bundle [ITI-65] transaction, which carries both the document and its metadata. This transaction is analogous to an XDS Provide and Register Document Set-b [ITI-41] transaction.



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Figure 33.4.2.2-1: Basic Process Flow in Provide Document Bundle Transaction

33.4.3 Use Case #2: Discovery and Retrieval of existing documents

33.4.3.1 Discovery and Retrieval of existing documents Use Case Description

455 In this use case, the mobile device needs access to existing documents. For example, a mobile device involved in a workflow needs to determine the current state of the workflow, or the mobile device needs to discover the most current medical summary.

33.4.3.2 Discovery and Retrieval of existing documents Process Flow

460 The Find Document References [ITI-67] transaction is used to issue parameterized queries that result in a list of DocumentReference Resources, where a DocumentReference Resource carries the XDS DocumentEntry metadata, which is metadata about a document.

Alternatively, the Find Document Manifest [ITI-66] transaction is used to issue parameterized queries that result in a set of DocumentManifest Resources, where a DocumentManifest

Resource carries the XDS SubmissionSet metadata, which is a container for a set of DocumentEntry objects that were published as a set.

465 The Retrieve Document [ITI-68] transaction is used to get the document itself.

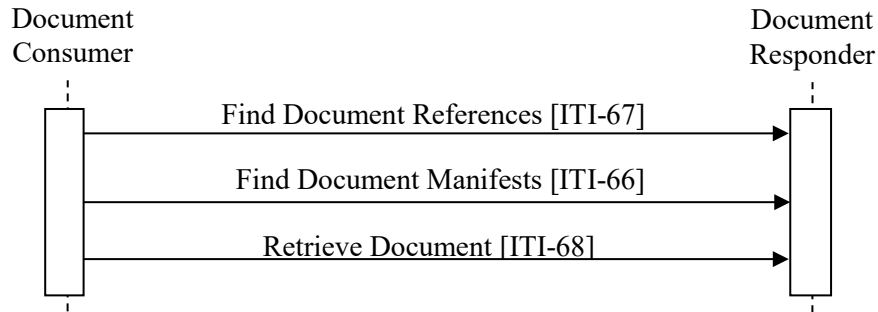


Figure 33.4.3.2-1: Basic Process Flow in MHD Profile

33.4.4 Mapping to RESTful operators

470 The MHD Profile defines a set of transactions against FHIR Resources. These are summarized in Table 33.4.4-1. MHD does not use any additional extended or custom methods.

Table 33.4.4-1: Methods and Resources

HTTP Method	Transactions on DocumentReference	Transactions on DocumentManifest	Transactions on Binary (document)
GET	Find Document References [ITI-67]	Find Document Manifests [ITI-66]	Retrieve Document [ITI-68]
PUT	Not Specified	Not Specified	Not Specified
POST	Provide Document Bundle [ITI-65]		
DELETE	Not Specified	Not Specified	Not Specified
UPDATE	Not Specified	Not Specified	Not Specified
HEAD	Not Specified	Not Specified	Not Specified
OPTIONS	Not Specified	Not Specified	Not Specified
TRACE	Not Specified	Not Specified	Not Specified

Note: Items are marked Not Specified because the MHD Profile is focused on core Document Sharing (XDS, XDR, etc.) capability and is not trying to address the larger use-cases of metadata update.

475 33.5 MHD Security Considerations

See ITI TF-2x: Appendix Z.8 “Mobile Security Considerations”

33.6 MHD Cross Profile Considerations

33.6.1 MHD Actor grouped with XDS infrastructure

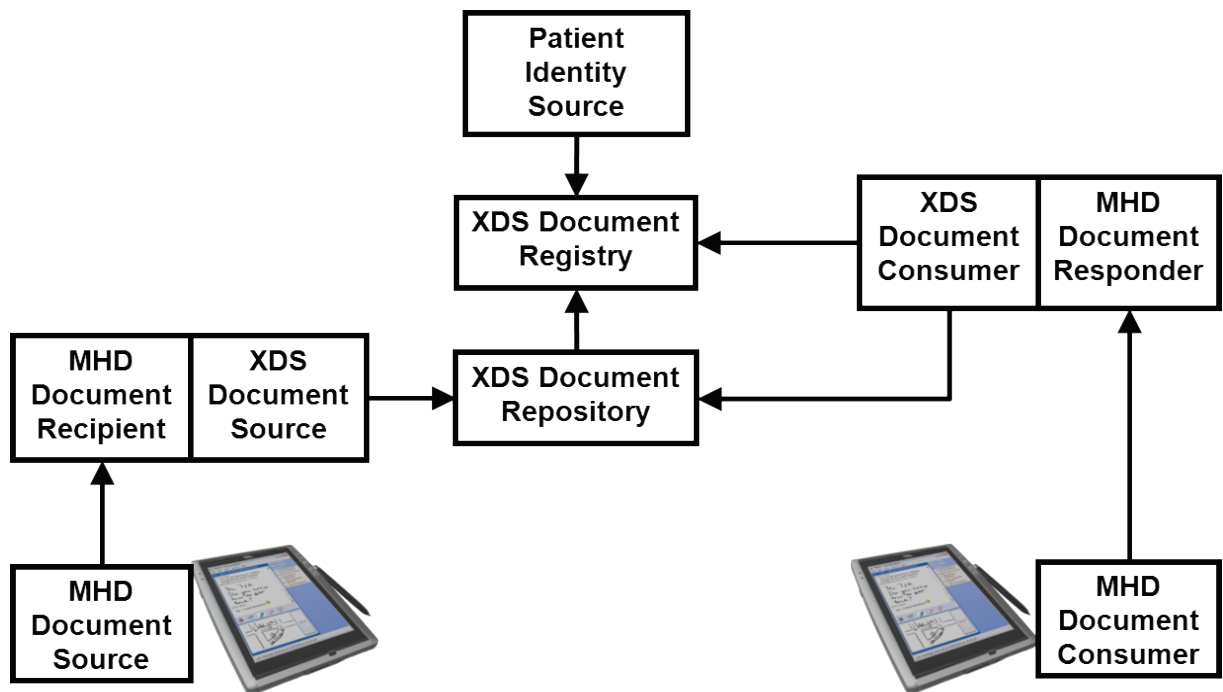
480 When the MHD Document Recipient is acting as a proxy for an XDS environment, it could be
grouped with an XDS Document Source as the “XDS on FHIR” Option defines. In this way, a
received Provide Document Bundle [ITI-65] transaction would be converted by the grouped
system into an XDS Provide and Register Document Set-b [ITI-41] transaction. The MHD
Document Recipient, acting as a proxy, would be configured to support only a designated set of
485 mobile devices authorized by the hosting organization and use the security model defined by that
hosting organization. The proxy might convert user authentication credentials, and fully
implement the ATNA Secure Node or Secure Application Actors.

Other proxy architectures to XDS are possible such as grouped with an XDS Integrated
Document Source/Repository Actor.

490 When the MHD Document Responder is acting as a proxy for an XDS environment, it could be
grouped with an XDS Document Consumer. In this way, the MHD Find Document Manifests
[ITI-66], Find Document References [ITI-67], and Retrieve Document [ITI-68] transactions will
be supported in the system using the appropriate XDS Registry Stored Query [ITI-18] and
Retrieve Document Set-b [ITI-43] transactions. This proxy would be configured to support a
designated set of mobile devices and the security model defined by the hosting organization. The
495 proxy might fill in missing metadata information, convert user authentication credentials, and
fully implement the IHE ATNA Secure Node or Secure Application Actors.

Not diagramed here is how PDQm and/or PIXm could similarly be used and implemented.

These two environments are illustrated in Figure 3.66.1-1.



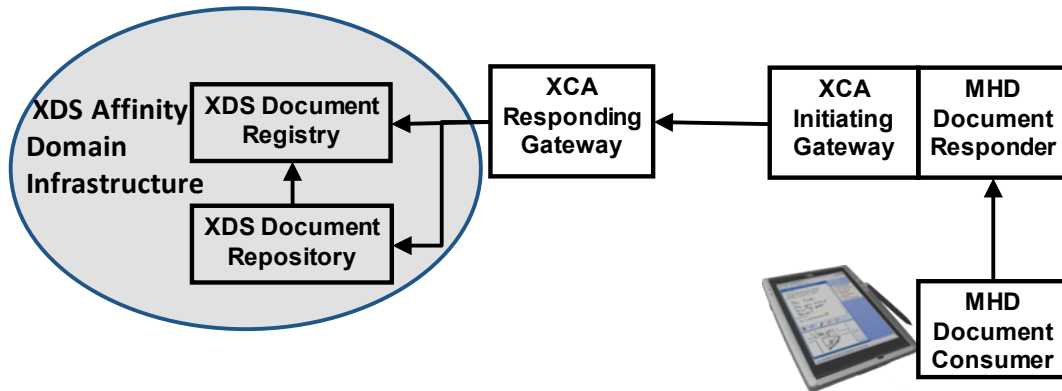
500

Figure 33.6.1-1: MHD Actors grouped with XDS Document Sharing

33.6.2 MHD Actors grouped with XCA infrastructure

When an MHD Document Responder acts as a proxy into an XCA environment, it could be grouped with an Initiating Gateway. This type of MHD Document Responder will support the Find Document Manifests [ITI-66], Find Document References [ITI-67], and Retrieve Document [ITI-68] transactions by utilizing the XCA Cross Gateway Query [ITI-38] and Cross Gateway Retrieve [ITI-39] transactions as necessary. This type of proxy would be configured to support a designated set of mobile devices and enable a security model as defined by the hosting organization. The proxy might fill in missing metadata information, convert user authentication credentials, and fully implement the ATNA Secure Node or Secure Application requirements.

505

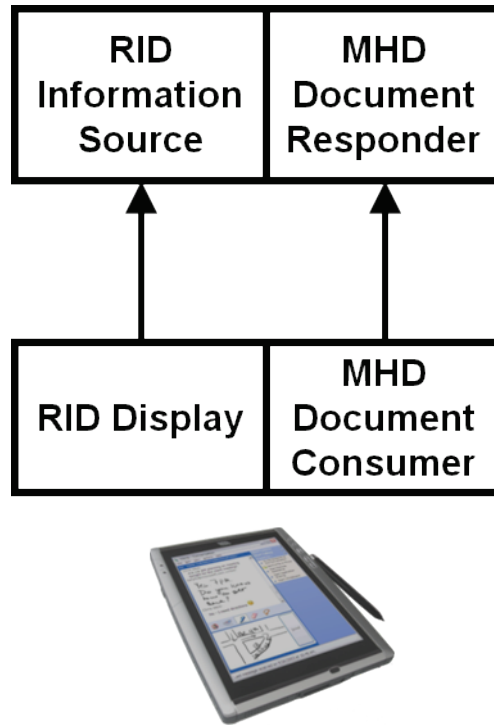


510

Figure 33.6.2-1: MHD Actors grouped with XCA

33.6.3 MHD Actor grouped with Retrieve Information for Display (RID) Profile

515 The Retrieve Information for Display (RID) Profile includes a similar set of transactions to those defined in the MHD Profile for Document Consumer. The RID Profile is focused more on delivering display-ready health information that may or may not be document based, whereas the MHD Profile focuses on providing access to Documents and the metadata about the document. Grouping the RID Information Source with an MHD Document Responder will provide both access to the metadata and document content, and also access to display-ready information.



520

Figure 33.6.3-1: MHD Actors grouped with RID

Appendices

Appendix A – Actor Summary Definitions

525 *Update (and add) the following terms to the IHE TF General Introduction Namespace list of actors:*

Document Source - The Document Source is the producer and publisher of documents and metadata. ~~It is responsible for sending documents to a Document Repository Actor. It also supplies metadata to the Document Repository Actor for subsequent registration of the documents with the Document Registry Actor.~~

530 **Document Consumer** - The Document Consumer queries for document metadata meeting certain criteria, and may retrieve selected documents.

Document Recipient: ~~This~~ The Document Recipient receives ~~a set of~~ documents and metadata sent by another actor. ~~Typically this document set will be made available to the intended recipient who will choose to either view it or integrate it into a Health Record.~~

535 **Document Responder** – The Document Responder sends documents and/or metadata in response to a request from another actor.

Appendix B – Transaction Summary Definitions

Add the following terms to the IHE TF General Introduction Namespace list of Transactions:

540 **Provide Document Bundle** - This transaction is used to transfer documents and metadata, and is analogous to a Provide and Register Document Set-b transaction.

Find Document Manifests – This transaction is used to issue parameterized queries that result in a list of Document Manifest resources.

545 **Find Document References** – This transaction is used to issue parameterized queries that result in a list of Document Reference resources.

Retrieve Document – This transaction is used to get documents.

Volume 2c – Transactions

550 *Add Sections 3.65, 3.66, 3.67 and 3.68*

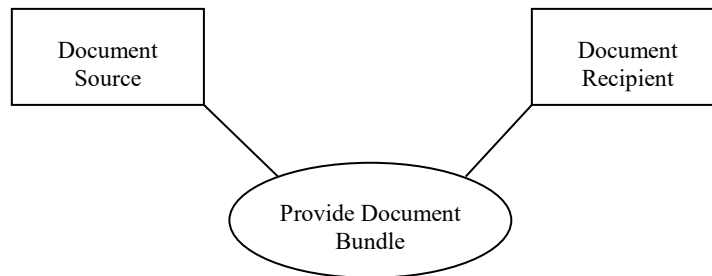
3.65 Provide Document Bundle [ITI-65]

555 This section corresponds to transaction [ITI-65] of the IHE Technical Framework. Transaction [ITI-65] is used by the Document Source and Document Recipient Actors. The Provide Document Bundle [ITI-65] transaction is used to transmit a set of documents and associated metadata.

3.65.1 Scope

The Provide Document Bundle [ITI-65] transaction passes a Provide Document Bundle Request from a Document Source to a Document Recipient.

3.65.2 Use Case Roles



560

Actor: Document Source

Role: Sends documents and metadata to the Document Recipient

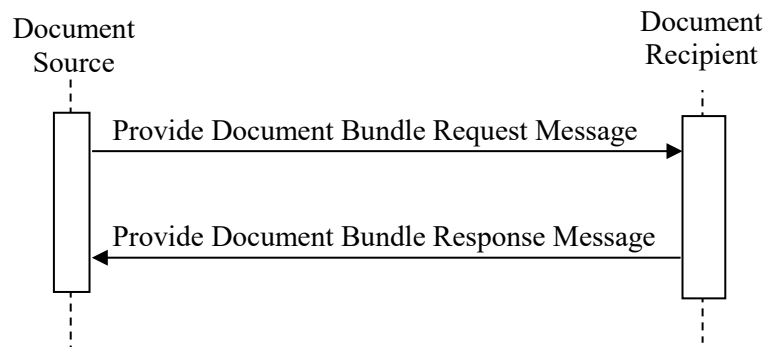
Actor: Document Recipient

565 **Role:** Accepts the document and metadata sent from the Document Source.

3.65.3 Referenced Standard

HL7 FHIR	HL7 FHIR standard STU3 http://hl7.org/fhir/STU3/index.html
RFC2616	Hypertext Transfer Protocol – HTTP/1.1
RFC7540	Hypertext Transfer Protocol – HTTP/2
RFC3986	Uniform Resource Identifier (URI): Generic Syntax
RFC4627	The application/json Media Type for JavaScript Object Notation (JSON)
RFC6585	Additional HTTP Status Codes

3.65.4 Interaction Diagram



570 3.65.4.1 Provide Document Bundle Request Message

This message uses the HTTP POST method on the target Provide Document Bundle endpoint to convey the metadata and the document(s) as a FHIR transaction.

3.65.4.1.1 Trigger Events

575 This method is invoked when the Document Source needs to submit one or more documents to a Document Recipient.

3.65.4.1.2 Message Semantics

580 The Document Source shall initiate a FHIR “transaction” using a “create” action by sending an HTTP POST request methods composed of a FHIR Bundle Resource containing the DocumentManifest resource, one or more DocumentReference Resources, zero or more List Resources, and zero or more Binary Resources to the Document Recipient. Refer to ITI TF-3: 4.5.1 for details on the FHIR Resources and how Document Sharing metadata attributes are mapped.

The media type of the HTTP body shall be either `application/fhir+json` or `application/fhir+xml`.

585 See <http://hl7.org/fhir/STU3/http.html#transaction> for complete requirements of a transaction.
See <http://hl7.org/fhir/STU3/bundle-transaction.html> for example of a transaction bundle.

The Provide Document Bundle message is sent to the base URL as defined in FHIR. See <http://hl7.org/fhir/STU3/http.html> for the definition of “HTTP” access methods and “base”.

590 The Document Source shall assure all FHIR resource elements are consistent with the Document Sharing metadata requirements as specified for attributes ITI TF-3: Table 4.3.1-3: “Sending Actor Metadata Attribute Optionality”. The Document Source that supports the “Comprehensive Metadata” or the “XDS on FHIR” Options shall assure consistency with column “XDS DS”; otherwise, the Document Source shall assure consistency with column “XDR MS”.

3.65.4.1.2.1 Bundle Resources

595 For complete information on constructing a FHIR Bundle Resource, see <http://hl7.org/fhir/STU3/bundle.html>

The FHIR `Bundle.meta.profile` shall include the value “`http://ihe.net/fhir/tag/iti-65`”. All resources that are indicated as ‘contained’ in ITI TF-3: 4.5.1 shall be contained using the FHIR contained method (See <http://hl7.org/fhir/STU3/references.html#contained>).

600 The `DocumentReference.content.attachment.url` points at the document content, which shall be in the Bundle as a Binary Resource. See FHIR Resolving references in Bundles at <http://hl7.org/fhir/STU3/bundle.html#references>.

3.65.4.1.2.2 Patient Identity

605 All `DocumentReference.subject` and `DocumentManifest.subject` values shall be References to FHIR Patient Resources identified by an absolute external reference (URL). This value may be obtained through use of PDQm or PIXm, or by some other means.

610 When `sourcePatientInfo` is provided, the `DocumentReference.context.sourcePatientInfo` shall be a reference to a “contained” Patient Resource. That is, the source patient info is encoded in a Patient Resource that is encoded within the `DocumentReference` or `DocumentManifest` Resource (See <http://hl7.org/fhir/STU3/references.html#contained>).

3.65.4.1.2.3 Replace, Transform, Signs, and Append Associations

615 The `DocumentReference.relatesTo` element indicates an association between `DocumentReference` resources. The `relatesTo.target` element in the provided `DocumentReference` points at the pre-existing `DocumentReference` that is being replaced, transformed, signed, or appended. The `relatesTo.code` element in the provided `DocumentReference` shall be the appropriate relationship type code defined in <http://hl7.org/fhir/STU3/valueset-document-relationship-type.html>.

3.65.4.1.3 Expected Actions

620 The Document Recipient shall accept both media types `application/fhir+json` and `application/fhir+xml`.

On receipt of the submission, the Document Recipient shall validate the resources and respond with one of the HTTP codes defined in Section 3.65.4.2.2 Message Semantics.

625 The Document Recipient shall process the bundle atomically, analogous to both the Provide and Register Document Set-b [ITI-41] transaction and FHIR “transaction” as specified in <http://hl7.org/fhir/STU3/http.html#transaction>.

The Document Recipient shall validate the bundle first against the FHIR specification. Guidance on what FHIR considers a valid Resource can be found at <http://hl7.org/fhir/STU3/validation.html>.

630 The Document Recipient shall verify the FHIR resource elements for consistency with the Document Sharing metadata requirements as specified for attributes ITI TF-3: Table 4.3.1-3: “Sending Actor Metadata Attribute Optionality”. The Document Recipient that supports the “Comprehensive Metadata” or the “XDS on FHIR” Option shall validate against column “XDS DS”; otherwise the Document Recipient shall validate against column “XDR MS”.

635 If necessary for processing, the Document Recipient shall retrieve Resources referenced by absolute URLs in the FHIR Bundle Resource.

If the Document Recipient encounters any errors or if any validation fails, the Document Recipient shall return an error, as documented in Section 3.65.4.2.2. If appropriate, it shall use error codes from ITI TF-3: Table 4.2.4.1-2.

640 If the Provide Document Bundle Message contains a DocumentReference Resource with a `relatesTo` element and the Document Recipient does not support the `relatesTo.code` value, it shall return a warning message, as indicated in Table 3.65.4.1.3-1.

Table 3.65.4.1.3-1: Warning message when relatesTo code is not supported

<code>relatesTo.code</code>	Warning
<code>replaces</code>	<code>PartialReplaceContentNotProcessed</code>
<code>transforms</code>	<code>PartialTransformContentNotProcessed</code>
<code>appends</code>	<code>PartialAppendContentNotProcessed</code>

645 If the Provide Document Bundle Message contains a List Resource and the Document Recipient does not support Folders, the Document Recipient shall return a `PartialFolderContentNotProcessed` warning.

3.65.4.1.3.1 XDS on FHIR Option

650 The MHD Document Recipient is grouped with an XDS Document Source when it supports the “XDS on FHIR” Option. The Document Recipient shall transform the Bundle content into a proper message for the Provide and Register Document Set-b [ITI-41] transaction. The Document Recipient shall create appropriate metadata from Resources in the FHIR Bundle Resource, including SubmissionSet, DocumentEntry, and Associations.

655 If the grouped XDS Document Source supports the Document Replacement, Document Transformation, or Document Addendum Option and the Provide Document Bundle Message contains a DocumentReference with a `relatesTo` element that has a code equal to "replaces", "transforms", or "appends", as defined in <http://hl7.org/fhir/STU3/valueset-document-relationship-type.html>, the XDS Document Source shall include a corresponding RPLC, XFRM, or APND Association in the Submission Set for the Provide and Register Document Set-b [ITI-41] transaction.

660 If the grouped XDS Document Source supports the Folder Management Option, the Document Recipient shall map List Resources in the Bundle Resource to XDS Folders, as specified in ITI TF-3: Table 4.5.1.1-1.

Some FHIR elements do not translate to XDS concepts; the handling of these elements is left to the implementer of the Document Recipient.

665 Upon successful conversion of the FHIR Bundle to XDS metadata, the grouped Document Source shall execute the Provide and Register Document Set-b [ITI-41] transaction. The transaction result, and any error or warning messages, shall be reported to the MHD Document Source. The Document Recipient is responsible for translating the XDS response to the appropriate HTTP Status Code and FHIR OperationOutcome Resource in the Provide Document
670 Bundle Response Message.

3.65.4.2 Provide Document Bundle Response Message

The Document Recipient returns a HTTP Status code appropriate to the processing outcome, conforming to the transaction specification requirements as specified in <http://hl7.org/fhir/STU3/http.html#transaction>

675 3.65.4.2.1 Trigger Events

This message shall be sent when a success or error condition needs to be communicated. Success is only indicated once the document(s) is/are received and completely processed and persisted as appropriate to the Document Recipient Actor configuration.

3.65.4.2.2 Message Semantics

680 To enable the Document Source to know the outcome of processing the transaction, and the identities assigned to the resources by the Document Recipient, the Document Recipient shall return a Bundle, with type set to transaction-response, that contains one entry for each entry in the request, in the same order as received, with the `Bundle.entry.response.outcome` indicating the

685 results of processing the entry (such as a PartialFolderContentNotProcessed warning). The Document Recipient shall comply with FHIR <http://hl7.org/fhir/STU3/bundle.html#transaction-response> and <http://hl7.org/fhir/STU3/http.html#transaction-response>.

3.65.4.2.3 Expected Actions

690 If the Document Recipient returns an HTTP redirect response (HTTP status codes 301, 302, 303, or 307), the Document Source shall follow the redirect, but may stop processing if it detects a loop. See [RFC7231 Section 6.4 Redirection 3xx](#).

The Document Source processes the results according to application-defined rules.

3.65.4.3 CapabilityStatement Resource

695 Document Recipient implementing this transaction should provide a CapabilityStatement Resource as described in ITI TF-2x: Appendix Z.3 indicating the operation has been implemented.

3.65.5 Security Considerations

See MHD Security Considerations in ITI TF-1: 33.5.

3.65.5.1 Security Audit Considerations

700 The security audit criteria are similar to those for the Provide and Register Document Set-b [ITI-41] transaction as this transaction does export a document. Grouping a Document Source or Document Recipient with an ATNA Secure Node or Secure Application is recommended, but not mandated. The Document Source may be considered overburdened to fully implement the requirements of Secure Node or Secure Application. The Document Recipient implementation is expected to be less constrained and should be grouped with a Secure Node or Secure Application
705 which would generate the equivalent to the audit event defined in ITI TF-2b: 3.41.5.1 Audit Record Considerations.

3.66 Find Document Manifests

710 This section corresponds to transaction [ITI-66] of the IHE Technical Framework. Transaction [ITI-66] is used by the Document Consumer and Document Responder Actors. This transaction is used to locate and return metadata for previously stored document submissions.

3.66.1 Scope

715 The Find Document Manifests [ITI-66] transaction is used to find DocumentManifest Resources that satisfy a set of parameters. It is equivalent to the FindSubmissionSets query in the Registry Stored Query [ITI-18] transaction, as documented in ITI TF-2a: 3.18.4.1.2.3.7.1. The result of the query is a Bundle containing DocumentManifest Resources that match the query parameters.

3.66.2 Actor Roles

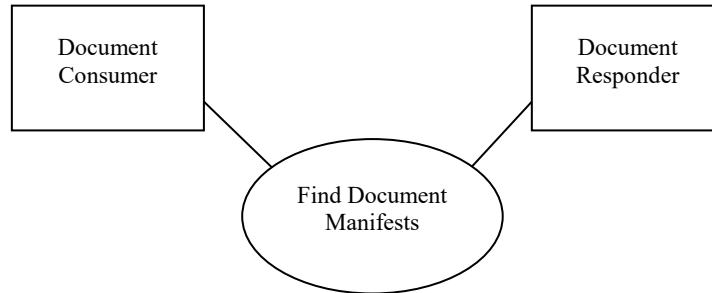


Figure 3.66.2-1: Use Case Diagram

Actor: Document Consumer

Role: Requests a list of DocumentManifest Resources, matching the supplied set of criteria, from the Document Responder.

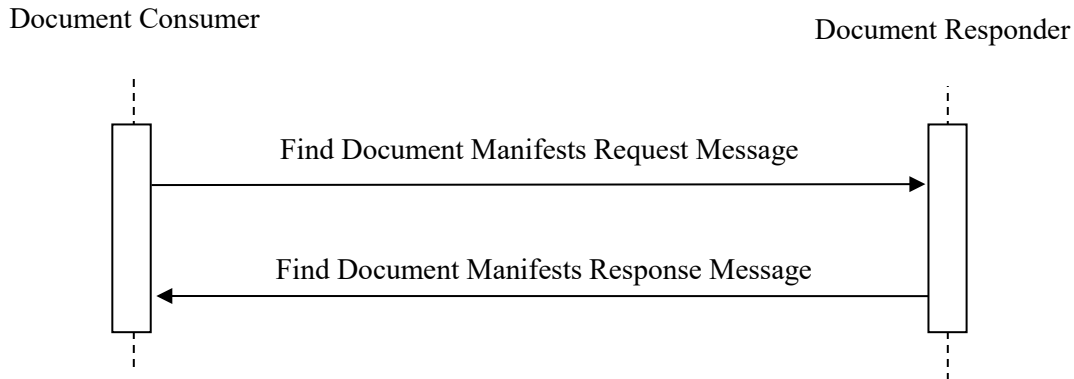
Actor: Document Responder

Role: Returns DocumentManifest Resources that match the search criteria provided by the Document Consumer.

720 3.66.3 Referenced Standards

HL7 FHIR	HL7 FHIR standard STU3 http://hl7.org/fhir/STU3/index.html
RFC2616	Hypertext Transfer Protocol – HTTP/1.1
RFC7540	Hypertext Transfer Protocol – HTTP/2
RFC3986	Uniform Resource Identifier (URI): Generic Syntax
RFC4627	The application/json Media Type for JavaScript Object Notation (JSON)
RFC6585	Additional HTTP Status Codes

3.66.4 Interaction Diagram



3.66.4.1 Find Document Manifests Request message

725 This message uses the HTTP GET method parameterized query to obtain DocumentManifest Resources from the Document Responder.

3.66.4.1.1 Trigger Events

When the Document Consumer needs to discover DocumentManifest Resources matching various metadata parameters it issues a Find Document Manifests message.

3.66.4.1.2 Message Semantics

730 The Document Consumer executes an HTTP GET against the Document Responder's DocumentManifest endpoint. The search target follows the FHIR HTTP specification, addressing the DocumentManifest Resource <http://hl7.org/fhir/STU3/http.html>:

[base]/DocumentManifest?<query>

735 This URL is configurable by the Document Responder and is subject to the following constraints:

The <query> represents a series of encoded name-value pairs representing the filter for the query, as specified in Section 3.66.4.1.2.1, as well as control parameters to modify the behavior of the Document Responder such as response format, or pagination.

740 3.66.4.1.2.1 Query Search Parameters

The Document Consumer may supply, and the Document Responder shall be capable of processing all query parameters listed below. All query parameter values shall be appropriately encoded per RFC3986 “percent” encoding rules. Note that percent encoding does restrict the character set to a subset of ASCII characters which is used for encoding all other characters used in the URL.

745

The Document Consumer shall include search parameter `patient` or `patient.identifier`, and `status`. The other parameters described below are optional. The Document Responder shall implement the parameters described below. The Document Responder may choose to support additional query parameters beyond the subset listed below. Any additional query parameters supported shall be supported according to the core FHIR specification. Such additional parameters are considered out of scope for this transaction. Any additional parameters not supported should be ignored. See <http://hl7.org/fhir/STU3/search.html#errors>.

`patient`

755 This parameter is of type `Reference(Patient)`. The Document Consumer may get this reference through the use of the PDQm or PIXm Profiles, or by some other method.

`patient.identifier`

This parameter, of type `token`, specifies an identifier associated with the patient to which the DocumentManifest Resource is assigned. See ITI TF-2x: Appendix Z.2.2 for use of the `token` data type for identifiers.

760 `created`

This parameter, of type `date`, specifies the time when the DocumentManifest was created. See FHIR <http://hl7.org/fhir/STU3/search.html#date> for use of the date search type.

`author.given` and `author.family`

765 These parameters, of type `string`, specify the name parts of the author person which is associated with the DocumentManifest. See ITI TF-2x: Appendix Z.2.3 for use of the `string` data type.

`type`

770 This parameter, of type `token`, specifies the `type.coding` value supplied in the DocumentManifest resource. See ITI TF-2x: Appendix Z.2.2 for additional constraints on the use of the `token` search parameter type.

`source`

775 This parameter, of type `uri`, specifies the `source` value supplied in the DocumentManifest resource. See FHIR <http://hl7.org/fhir/STU3/search.html#uri> for use of the `uri` search type.

`status`

780 This parameter, of type `token`, specifies the status of the DocumentManifest. If included in the query, the Document Consumer shall populate the `code` portion of the token with one of the codes in Table 3.66.4.1.2.1-1. The system portion of the token shall not be populated.

Table 3.66.4.1.2.1-1: Values for code for status of DocumentManifest

Code	ebRIM Code
current	urn:oasis:names:tc:ebxml-regrep:StatusType:Approved
superseded	urn:oasis:names:tc:ebxml-regrep:StatusType:Deprecated

3.66.4.1.2.2. Populating Expected Response Format

785 The FHIR standard provides encodings for responses as either XML or JSON. The Document Responder shall support both message encodings, whilst the Document Consumer shall support one and may support both.

See ITI TF-2x: Appendix Z.6 for details.

3.66.4.1.3 Expected Actions

790 The Document Responder shall process the query to discover the DocumentManifest entries that match the search parameters given.

3.66.4.1.3.1 XDS on FHIR Option

795 The Document Responder is grouped with an XDS Document Consumer when it supports the “XDS on FHIR” Option. The Document Responder shall map the query parameters as listed in Table 3.66.4.1.3-1, and shall execute a Registry Stored Query [ITI-18] for FindSubmissionSets. No additional Query parameters as defined in FHIR are required of the Document Responder.

Table 3.66.4.1.3-1: FindSubmissionSets Query Parameter Mapping

ITI-66 Parameter Name	ITI-18 Parameter Name
patient or patient.identifier	\$XDSSubmissionSetPatientId
created ^{Note 1}	\$XDSSubmissionSetSubmissionTimeFrom
created ^{Note 2}	\$XDSSubmissionSetSubmissionTimeTo
author.given/author.family	\$XDSSubmissionSetAuthorPerson
type	\$XDSSubmissionSetContentType
source	\$XDSSubmissionSetSourceId
status	\$XDSSubmissionSetStatus

Note 1: This FindSubmissionSets parameter is used when the greater than parameter modifier is used on the created parameter.

800 Note 2: This FindSubmissionSets parameter is used when the less than parameter modifier is used on the created parameter.

A translation of these query parameters from FHIR query parameter format to the IHE Document Sharing metadata format is provided in Section 3.66.4.1.3.1.1 through Section 3.66.4.1.3.1.2

3.66.4.1.3.1.1 Translation of Token Parameter

805 Query parameters of type `token` are used to represent codes and identifiers. See <https://www.hl7.org/fhir/STU3/search.html#token>.

The manner in which the Document Responder translates these parameters to ebXML to support the Registry Stored Query [ITI-18] transaction will depend on the type of the corresponding parameter within the FindSubmissionSets stored query (see ITI TF-2a: 3.18.4.1.2.3.7.2).

- 810
- If the token parameter translates to a codified stored query parameter then the Document Responder shall represent the token parameter in the Stored Query as:
`<Value>('code^^system')</Value>`
 - If the token parameter translates to a patient identifier in the FindSubmissionSets stored query then the Document Responder shall represent the token parameter in the Stored Query as: `<Value>code^^^&system&ISO</Value>`
 - If the token parameter translates to a simple string, then the code shall be used for the parameter and the system shall be ignored.
- 815

3.66.4.1.3.1.2 Translation of Name Components

820 Query parameters representing a name, for example “`author.given`” and “`author.family`” shall be translated to an appropriate XCN instance in the ebXML query. For example:

```
...&author.given=Marcus&author.family=Welby
```

Would translate to:

```
<Value>^Welby^Marcus^^^</Value>
```

3.66.4.2 Find Document Manifests Response message

825 The Document Responder returns a HTTP Status code appropriate to the processing as well as a list of the matching document manifest resources.

3.66.4.2.1 Trigger Events

The Document Responder completed processing of the Find Document Manifests message.

3.66.4.2.2 Message Semantics

830 Based on the query results, the Document Responder will either return an error or success. Guidance on handling Access Denied related to use of 200, 403 and 404 can be found in ITI TF-2x: Appendix Z.7.

When the Document Responder needs to report an error, it shall use HTTP error response codes and should include a FHIR OperationOutcome with more details on the failure. See FHIR <http://hl7.org/fhir/STU3/http.html> and <http://hl7.org/fhir/STU3/operationoutcome.html>

835

If the Find Document Manifests message is processed successfully, whether or not any DocumentManifest Resources are found, the HTTP status code shall be 200. The Find Document

Manifests Response message shall be a Bundle Resource containing zero or more DocumentManifest Resources. If the Document Responder is sending warnings, the Bundle
840 Resource shall also contain an OperationOutcome Resource that contains those warnings.

The response shall adhere to the FHIR Bundle constraints specified in ITI TF-2x: Appendix Z.1.

3.66.4.2.2.1 DocumentManifest Resource Contents

The DocumentManifest Resource is defined in the FHIR specification
<http://hl7.org/fhir/STU3/documentmanifest.html>

845 See ITI TF-3: 4.5.1.2 for IHE restrictions on the DocumentManifest Resource and for a mapping of ebXML attributes to DocumentManifest elements.

3.66.4.2.3 Expected Actions

850 If the Document Responder returns an HTTP redirect response (HTTP status codes 301, 302, 303, or 307), the Document Consumer shall follow the redirect, but may stop processing if it detects a loop. See [RFC7231 Section 6.4 Redirection 3xx](#).

The Document Consumer shall process the results according to application-defined rules. The Document Consumer should be robust as the response may contain DocumentManifest Resources that match the query parameters but are not compliant with the DocumentManifest constraints defined in ITI TF-3: 4.5.

3.66.4.3 CapabilityStatement Resource

855 Document Responders implementing this transaction should provide a CapabilityStatement Resource as described in ITI TF-2x: Appendix Z.3 indicating the query operation for the DocumentManifest Resource has been implemented and shall include all query parameters implemented for the DocumentManifest Resource.

3.66.5 Security Considerations

860 See MHD Security Considerations in ITI TF-1: 33.5.

3.66.5.1 Security Audit Considerations

865 The security audit criteria are similar to those for the Registry Stored Query [ITI-18] transaction. Grouping a Document Consumer or Document Responder with an ATNA Secure Node or Secure Application is recommended, but not mandated. The Document Consumer may be considered overburdened to fully implement the requirements of Secure Node or Secure Application. The Document Responder implementation is expected to be less constrained and should be grouped with a Secure Node or Secure Application which would generate the equivalent of the audit event defined in ITI TF-2a: 3.18.5.1.2 Document Registry audit message.

870

3.67 Find Document References

This section corresponds to transaction [ITI-67] of the IHE Technical Framework. Transaction [ITI-67] is used by the Document Consumer and Document Responder Actors.

3.67.1 Scope

875 The Find Document References transaction is used to find DocumentReference Resources that satisfy a set of parameters. It is equivalent to the FindDocuments and FindDocumentsByReferenceId queries from the Registry Stored Query [ITI-18] transaction. The result of the query is a FHIR Bundle containing DocumentReference Resources that match the query parameters.

880 3.67.2 Actor Roles

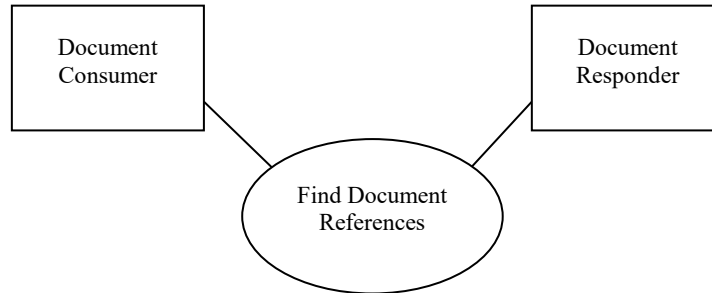


Figure 3.67.2-1: Use Case Diagram

Actor: Document Consumer

Role: Requests a list of DocumentReference Resources, matching the supplied set of criteria, from the Document Responder.

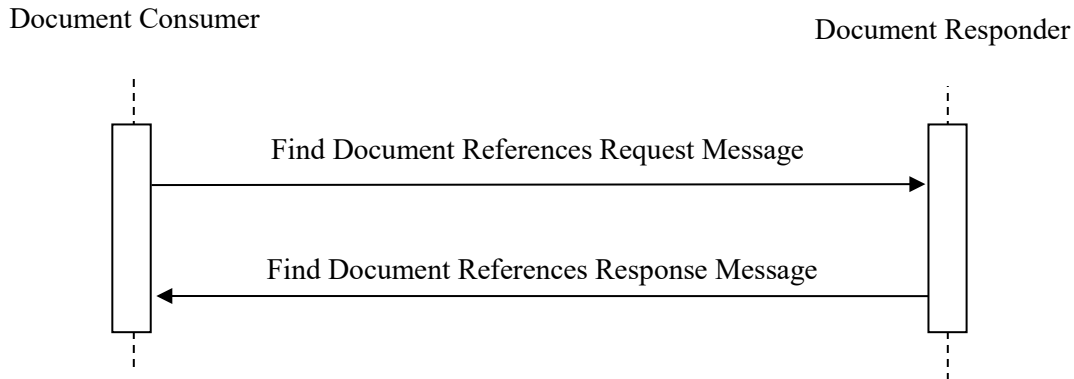
Actor: Document Responder

Role: Returns DocumentReference Resources that match the search criteria provided by the Document Consumer.

3.67.3 Referenced Standards

HL7 FHIR	HL7 FHIR standard STU3 http://hl7.org/fhir/STU3/index.html
RFC2616	Hypertext Transfer Protocol – HTTP/1.1
RFC7540	Hypertext Transfer Protocol – HTTP/2
RFC3986	Uniform Resource Identifier (URI): Generic Syntax
RFC4627	The application/json Media Type for JavaScript Object Notation (JSON)
RFC6585	Additional HTTP Status Codes

885 **3.67.4 Interaction Diagram**



3.67.4.1 Find Document References Request message

This message uses the HTTP GET method parameterized query to obtain DocumentReference Resources from the Document Responder.

890 **3.67.4.1.1 Trigger Events**

When the Document Consumer needs to discover DocumentReference Resources matching various metadata parameters, it issues a Find Document References message.

3.67.4.1.2 Message Semantics

895 The Document Consumer executes an HTTP GET against the Document Responder’s DocumentReference URL. The search target follows the FHIR HTTP specification, addressing the DocumentReference Resource <http://hl7.org/fhir/STU3/http.html>:

[base]/DocumentReference?<query>

900 This URL is configurable by the Document Responder and is subject to the following constraints:

The <query> represents a series of encoded name-value pairs representing the filter for the query, as specified in Section 3.67.4.1.2.1, as well as control parameters to modify the behavior of the Document Responder such as response format, or pagination.

3.67.4.1.2.1 Query Search Parameters

905 The Document Consumer may supply, and the Document Responder shall be capable of processing, all query parameters listed below. All query parameter values shall be appropriately encoded per RFC3986 “percent” encoding rules. Note that percent encoding does restrict the character set to a subset of ASCII characters which is used for encoding all other characters used in the URL.

910 The Document Consumer shall include search parameter `patient` or `patient.identifier`, and `status`. The other parameters described below are optional. The Document Responder must implement the parameters described below. The Document Responder may choose to support additional query parameters beyond the subset listed below. Any additional query parameters supported shall be supported according to the core FHIR specification. Such
 915 additional parameters are considered out of scope for this transaction. Any additional parameters not supported should be ignored. See <http://hl7.org/fhir/STU3/search.html#errors>.

`patient`

This parameter is of type `Reference(Patient)`. The Document Consumer may get this reference using the PDQm or PIXm Profile.

920 `patient.identifier`

This parameter, of type `token`, specifies an identifier associated with the patient to which the `DocumentReference` Resource is assigned. Please see ITI TF-2x: Appendix Z.2.2 for additional constraints on the use of the token search parameter type.

`status`

925 This parameter, of type `token`, specifies the status of the `DocumentReference`. The consumer shall populate the identifier portion of the token using one of the short codes in Table 3.67.4.1.2.1-1. The system portion of the token shall not be populated.

Table 3.67.4.1.2.1-1: Values for code for status of DocumentReference

FHIR Code	ebRIM Code
current	urn:oasis:names:tc:ebxml-regrep:StatusType:Approved
superseded	urn:oasis:names:tc:ebxml-regrep:StatusType:Deprecated

930 `indexed`

This parameter, of type `date`, specifies the time when the `DocumentReference` was created. See FHIR <http://hl7.org/fhir/STU3/search.html#date> for use of the date search type.

`author.given` and `author.family`

935 These parameters, of type `string`, specify the name parts of the author person which is associated with the `DocumentReference`. See ITI TF-2x: Appendix Z.2.3 for use of the `string` data type.

`class`

940 This parameter, of type `token`, specifies the general classification of the `DocumentReference` resource, or in Document Sharing nomenclature, the class code of the Document Entry. See ITI TF-2x: Appendix Z.2.2 for additional constraints on the use of the `token` search parameter type.

type

945 This parameter, of type `token`, specifies the specific type of the `DocumentReference` resource or in Document Sharing nomenclature, the type code of the Document Entry. See ITI TF-2x: Appendix Z.2 for additional constraints on the use of the `token` search parameter type.

setting

950 This parameter, of type `token`, specifies the specific practice setting of the `DocumentReference` resource or in Document Sharing nomenclature, the `PracticeSettingCode` of the Document Entry. See ITI TF-2x: Appendix Z.2 for additional constraints on the use of the `token` search parameter type.

period

955 This parameter, of type `date`, represents the time of service that is being documented by the `DocumentReference`. The period search parameter specifies an interval which the time of service overlaps. In Document Sharing nomenclature, this query parameter represents from/to parameters for the `serviceStartTime` and `serviceStopTime` of the Document Entry. See FHIR <http://hl7.org/fhir/STU3/search.html#date> for use of the date search type.

960 facility

This parameter, of type `token`, specifies the kind of facility found in `DocumentReference` `resource.context.facilityType`; or in Document Sharing nomenclature, the healthcare facility type of the Document Entry. See ITI TF-2x: Appendix Z.2.2 for additional constraints on the use of the `token` search parameter type.

965 event

This parameter, of type `token`, specifies the main clinical acts documented by the `DocumentReference` resource or in Document Sharing nomenclature, the event code list of the Document Entry. See ITI TF-2x: Appendix Z.2.2 for additional constraints on the use of the `token` search parameter type.

970 securityLabel

This parameter, of type `token`, specifies the security labels of the document referenced by `DocumentReference` resource or in IHE Document Sharing nomenclature, the `confidentialityCode` of the Document Entry. See ITI TF-2x: Appendix Z.2.2 for additional constraints on the use of the `token` search parameter type.

975 format

This parameter, of type `token`, specifies the format of the `DocumentReference` resource or in Document Sharing nomenclature, the format code of the Document Entry. See ITI TF-2x: Appendix Z.2.2 for additional constraints on the use of the `token` search parameter type.

980 related-id

This parameter, of type token, represents other identifiers associated with the DocumentReference resource. In IHE Document Sharing nomenclature, this query parameter represents the referenceIdList. See ITI TF-2x: Appendix Z.2.2 for additional constraints on the use of the token search parameter type.

985 **3.67.4.1.2.2 Populating Expected Response Format**

The FHIR standard provides encodings for responses as either XML or JSON. The Document Responder shall support both message encodings, whilst the Document Consumer shall support one and may support both.

See ITI TF-2x: Appendix Z.6 for details.

990 **3.67.4.1.3 Expected Actions**

The Document Responder shall process the query to discover the DocumentReference entries that match the search parameters given.

3.67.4.1.3.1 XDS on FHIR Option

995 The Document Responder is grouped with an XDS Document Consumer when it supports the “XDS on FHIR” Option. The Document Responder shall map the query parameters as listed in Table 3.67.4.1.3-1, and shall execute a Registry Stored Query [ITI-18] for FindDocuments or FindDocumentsByReferenceIdList (see ITI TF-2a: 3.18.4.1.2.3.7.1 and 3.18.4.1.2.3.7.14). All of the query parameters in Table 3.67.4.1.3-1 shall be supported by the Document Responder. No additional query parameters as defined in FHIR are required of the Document Responder, but they may be offered.

1000

Table 3.67.4.1.3-1: XDS FindDocuments Query Parameter Mapping

ITI-67 Parameter Name	ITI-18 Parameter Name
patient or patient.identifier	\$XDSDocumentEntryPatientId
indexed ^{Note 1}	\$XDSDocumentEntryCreationTimeFrom
indexed ^{Note 2}	\$XDSDocumentEntryCreationTimeTo
author.given / author.family	\$XDSDocumentEntryAuthorPerson
status	\$XDSDocumentEntryStatus
(Not supported) ^{Note 3}	\$XDSDocumentEntryType
class	\$XDSDocumentEntryClassCode
type	\$XDSDocumentEntryTypeCode
setting	\$XDSDocumentEntryPracticeSettingCode
period ^{Note 1}	\$XDSDocumentEntryServiceStartTimeFrom
period ^{Note 2}	\$XDSDocumentEntryServiceStartTimeTo

ITI-67 Parameter Name	ITI-18 Parameter Name
period ^{Note 1}	\$XDSDocumentEntryServiceStopTimeFrom
period ^{Note 2}	\$XDSDocumentEntryServiceStopTimeTo
facility	\$XDSDocumentEntryHealthcareFacilityTypeCode
event	\$XDSDocumentEntryEventCodeList
securitylabel	\$XDSDocumentEntryConfidentialityCode
format	\$XDSDocumentEntryFormatCode
related-id ^{Note 4}	\$XDSDocumentEntryReferenceIdList

Note 1: This FindDocuments parameter is used when the greater than parameter modifier is used on the indexed parameter.

Note 2: This FindDocuments parameter is used when the less than parameter modifier is used on the indexed parameter.

Note 3: The \$XDSDocumentEntryType is not a supported query parameter in HL7 FHIR.

1005

Note 4: The \$XDSDocumentEntryReferenceIdList can only be mapped when using the XDS FindDocumentsByReferenceId query.

A translation of these query parameters from FHIR query parameter format to the IHE Document Sharing metadata format is provided in Section 3.66.4.1.3.1.1 through Section 3.66.4.1.3.1.2.

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3.67.4.2 Find Document References Response message

The Document Responder returns a HTTP Status code appropriate to the processing as well as a Bundle of the matching DocumentReference Resources.

3.67.4.2.1 Trigger Events

1015

The Document Responder completed processing of the Find Document Reference Request message.

3.67.4.2.2 Message Semantics

Based on the query results, the Document Responder will either return an error or success. Guidance on handling Access Denied related to use of 200, 403 and 404 can be found in ITI TF-2x: Appendix Z.7.

1020

When the Document Responder needs to report an error, it shall use HTTP error response codes and should include a FHIR OperationOutcome with more details on the failure. See FHIR <http://hl7.org/fhir/STU3/http.html> and <http://hl7.org/fhir/STU3/operationoutcome.html>

1025

If the Find Document References message is processed successfully, whether or not any DocumentReference Resources are found, the HTTP status code shall be 200. The Find Document References Response message shall be a Bundle Resource containing zero or more DocumentReference Resources. If the Document Responder is sending warnings, the Bundle Resource shall also contain an OperationOutcome Resource that contains those warnings.

The response shall adhere to the FHIR Bundle constraints specified in ITI TF-2x: Appendix Z.1.

3.67.4.2.2.1 DocumentReference Resource Contents

1030 The DocumentReference Resource is defined in the FHIR specification
<http://hl7.org/fhir/STU3/documentreference.html>

See ITI TF-3: 4.5.1.1 for the IHE restrictions on DocumentReference Resource and for a mapping from IHE Document Sharing profiles (e.g. XDS) to FHIR.

3.67.4.2.2.2 Resource Bundling

1035 Resource Bundling shall comply with the guidelines in ITI TF-2x: Appendix Z.1.

3.67.4.2.2.2.1 Document location

The Document Responder shall place into the `DocumentReference.content.attachment.url` element a full URL that can be used by the Document Consumer to retrieve the document using the Retrieve Document [ITI-68] transaction. IHE does not specify the format of the URL.

3.67.4.2.3 Expected Actions

1040 If the Document Responder returns an HTTP redirect response (HTTP status codes 301, 302, 303, or 307), the Document Consumer shall follow the redirect, but may stop processing if it detects a loop. See [RFC7231 Section 6.4 Redirection 3xx](#).

1045 The Document Consumer shall process the results according to application-defined rules. The Document Consumer should be robust as the response may contain DocumentReference Resources that match the query parameters but are not compliant with the DocumentReference constraints defined in ITI TF-3: 4.5.

3.67.4.3 CapabilityStatement Resource

1050 Document Responders implementing this transaction should provide a CapabilityStatement Resource as described in ITI TF-2x: Appendix Z.3 indicating the query operation for the DocumentReferences Resource has been implemented and shall include all query parameters implemented for the DocumentReference Resource.

3.67.5 Security Considerations

See MHD Security Considerations in ITI TF-1: 33.5.

3.67.5.1 Security Audit Considerations

1055 The security audit criteria are similar to those for the Registry Stored Query [ITI-18] transaction. Grouping the Document Consumer or Document Responder with an ATNA Secure Node or Secure Application is recommended, but not mandated. The Document Consumer may be considered overburdened to fully implement the requirements of Secure Node or Secure Application. The Document Responder implementation is expected to be less constrained and

1060

should be grouped with a Secure Node or Secure Application which would generate an equivalent event to the audit event defined in ITI TF-2a: 3.18.5.1.2 Document Registry audit message.

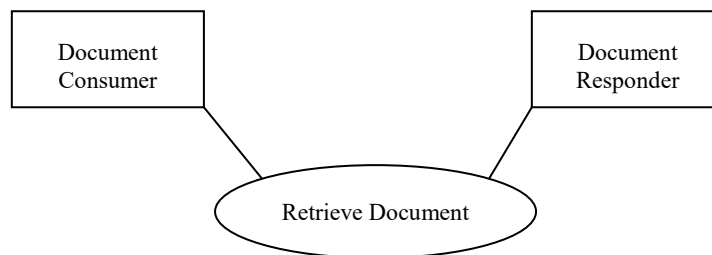
1065 **3.68 Retrieve Document**

This section corresponds to transaction [ITI-68] of the IHE Technical Framework. Transaction [ITI-68] is used by the Document Consumer and Document Responder Actors.

3.68.1 Scope

1070 The Retrieve Document [ITI-68] transaction is used by the Document Consumer to retrieve a document from the Document Responder.

3.68.2 Use Case Roles



Actor: Document Consumer

1075 **Role:** Requests a document from the Document Responder

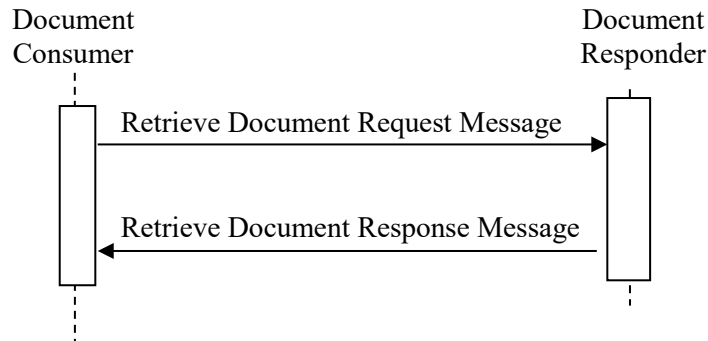
Actor: Document Responder

Role: Serves the document to the Document Consumer

3.68.3 Referenced Standard

HL7 FHIR	HL7 FHIR standard STU3 http://hl7.org/fhir/STU3/index.html
RFC2616	Hypertext Transfer Protocol – HTTP/1.1
RFC7540	Hypertext Transfer Protocol – HTTP/2
RFC3986	Uniform Resource Identifier (URI): Generic Syntax
RFC6585	Additional HTTP Status Codes

1080 **3.68.4 Interaction Diagram**



3.68.4.1 Retrieve Document Request Message

This message is an HTTP GET request to retrieve the document.

3.68.4.1.1 Trigger Events

1085 The Document Consumer wants to obtain a document.

3.68.4.1.2 Message Semantics

The Document Consumer sends a HTTP GET request to the server. The Document Consumer request may be to retrieve the document content referenced by a `DocumentReference.content.attachment.url`.

1090 The Document Consumer may provide a HTTP Accept header, according to the semantics of the HTTP protocols (see RFC2616, Section 14.1). The only MIME type assured to be returned is the MIME type indicated in the `DocumentReference.content.attachment.contentType`.

The HTTP If-Unmodified-Since header shall not be included in the GET request.

3.68.4.1.3 Expected Actions

1095 The Document Responder shall provide the document in the requested MIME type or reply with an HTTP status code indicating the error condition. The Document Responder is not required to transform the document.

3.68.4.2 Retrieve Document Response Message

This is the return message sent by the Document Responder.

1100 **3.68.4.2.1 Trigger Events**

The HTTP Response message is sent upon completion of the Retrieve Document Request.

3.68.4.2.2 Message Semantics

1105 This message shall be an HTTP Response, as specified by RFC2616. When the requested document is returned, the Document Responder shall respond with HTTP Status Code 200. The HTTP message-body shall be the content of the requested document.

Table 3.68.4.2.2-1 contains error situations and the HTTP Response.

Table 3.68.4.2.2-1: HTTP Error Response Codes and Suggested Text

Situation	HTTP Response
URI not known	404 Document Not Found
Document is Deprecated or not available	410 Gone (or 404 when 410 is unacceptable due to security/privacy policy)
Document Responder unable to format document in content types listed the 'Accept' field	406 Not Acceptable
HTTP request specified is otherwise not a legal value	403 Forbidden/Request Type Not Supported

1110 The Document Responder may return other HTTP Status Codes. Guidance on handling Access Denied related to use of 200, 403 and 404 can be found in ITI TF-2x: Appendix Z.7.

The Document Responder should complement the returned error code with a human readable description of the error condition.

The Document Responder may return HTTP redirect responses (responses with HTTP Status Codes 301, 302, 303 or 307) in response to a request. See [RFC7231 Section 6.4 Redirection 3xx](#).

1115 **3.68.4.2.3 Expected Actions**

If the Document Responder returns an HTTP redirect response (HTTP status codes 301, 302, 303, or 307), the Document Consumer shall follow the redirect, but may stop processing if it detects a loop. See [RFC7231 Section 6.4 Redirection 3xx](#).

The Document Consumer processes the results according to application-defined rules.

1120 **3.68.5 Security Considerations**

See MHD Security Considerations in ITI TF-1: 33.5.

3.68.5.1 Security Audit Considerations

1125 The security audit criteria are similar to those for the Retrieve Document Set-b [ITI-43] transaction as this transaction does retrieve the content of a document. Grouping the Document Consumer or Document Responder with an ATNA Secure Node or Secure Application is

1130 recommended, but not mandated. The Document Consumer may be considered overburdened to fully implement the requirements of Secure Node or Secure Application. The Document Responder implementation is expected to be less constrained and should be grouped with a Secure Node or Secure Application which would generate an equivalent event to the audit event defined in ITI TF-2b: 3.43.6.1.2 Document Repository audit message.

Volume 3 – Content Modules

Add Section 4.5

1135 4.5 FHIR Representation

This section documents the mapping between IHE Document Sharing Metadata and the FHIR Resources.

4.5.1 Metadata Object Types mapped to FHIR

For details on FHIR resources and data-types see HL7 FHIR <http://hl7.org/fhir/STU3/>.

1140 Some Document Sharing Metadata attributes must be treated as ‘contained’ FHIR Resources. These are indicated using “Note 1”, and use of the word ‘contained’ in the Notes column of Table 4.5.1.1-1. The details of the FHIR ‘contained’ mechanism is found at <http://hl7.org/fhir/STU3/references.html#contained>.

1145 When encoding XDS identifiers into FHIR Resource data elements of type Identifier, the FHIR notation of OIDs and UUIDs uses the system identifier of “urn:ietf:rfc:3986”. For more details and examples see ITI TF-2x: Appendix E.3 “FHIR Identifier Type”.

4.5.1.1 DocumentEntry Metadata Attributes

1150 Table 4.5.1.1-1 provides a mapping of Document Sharing DocumentEntry attributes to FHIR DocumentReference Resource elements. The full DocumentEntry metadata attribute definition is in ITI TF-3: 4.2.3.2.

Note: FHIR contains an informative mapping that is intended to be equivalent to Table 4.5.1.1-1. The informative FHIR mapping can be found at <http://hl7.org/fhir/STU3/documentreference-mappings.html#xds>.

Table 4.5.1.1-1: FHIR DocumentReference mapping to DocumentEntry

FHIR DocumentReference Resource Definition	IHE constraint	Document Sharing Metadata	Notes
masterIdentifier Identifier [0..1]	[1..1]	uniqueId	See ITI TF-2x: Z.9.1.1 Identifier and CDA root plus extension
identifier Identifier [0..*]		entryUUID	When the DocumentReference.identifier carries the entryUUID then the DocumentReference.identifier.use shall be ‘official’

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FHIR DocumentReference Resource Definition	IHE constraint	Document Sharing Metadata	Notes
subject Resource(Patient Practitioner Group Device) [0..1]	Reference(Patient)	patientId	Not a contained resource. URL Points to an existing Patient Resource representing the XDS Affinity Domain Patient.
type CodeableConcept [1..1]		typeCode	
class CodeableConcept [0..1]		classCode	
author Reference(Practitioner Organization Device Patient RelatedPerson) [0..*]	Reference(Practitioner Organization) Note 1	authorPerson, authorInstitution, authorDevice	Contained resource of type Practitioner with: <ul style="list-style-type: none"> authorInstitution: Organization authorPerson: Practitioner.identifier and Practitioner.name authorRole: —Not supported in STU3 authorSpecialty: Practitioner.qualification authorTelecommunication: Practitioner.telecom
custodian Reference(Organization) [0..1]	[0..0]		Not Used ^{Note 3}
authenticator Reference(Practitioner Organization) [0..1]	Note 1	legalAuthenticator	Contained resource
created dateTime [0..1]	[0..0]		
indexed instant [1..1]		creationTime	
status code {DocumentReferenceStatus} [1..1]		availabilityStatus	approved → status=current deprecated → status=superseded
docStatus code [0..1]	[0..0]		Not Used ^{Note 3}
relatesTo [0..*]		Relationship Association	See ITI TF-2c: 3.65.4.1.2.3
relatesTo.code code [1..1]		Relationship type	
relatesTo.target Reference(DocumentReference) [1..1]		relationship reference	
description string [0..1]		title	

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FHIR DocumentReference Resource Definition	IHE constraint	Document Sharing Metadata	Notes
securityLabel CodeableConcept [0..*]		confidentialityCode	Note: This is NOT the DocumentReference.meta, as that holds the meta tags for the DocumentReference itself.
content [1..*]			
content.attachment			
content.attachment.contentType code [0..1]	[1..1]	contentType	
content.attachment.language code [0..1]		languageCode	
content.attachment.data base64Binary [0..1]	[0..0]		Not Used ^{Note 3}
content.attachment.url uri [0..1]	[1..1]	retrievable location of the document	
content.attachment.size integer [0..1]		size	The size is calculated on the data prior to base64 encoding, if the data is base64 encoded.
content.attachment.hash string [0..1]		hash	The IHE Document Sharing metadata element hash holds the SHA1 hash of the document. The hash is encoded in FHIR in base64Binary, whereas in XDS hexbinary is used. The hash is calculated on the data prior to base64 encoding, if the data is base64 encoded.
content.attachment.title string [0..1]		comments	
content.attachment.creation dateTime [0..1]	[0..0]		Not Used ^{Note 3}
content.format Coding [0..1]		formatCode	
context [0..1]			
context.encounter Reference(Encounter) [0..1]		referenceIdList	When referenceIdList contains an encounter, and a FHIR Encounter is available, it may be referenced.
context.event CodeableConcept [0..*]		eventCodeList	
context.period Period [0..1]		serviceStartTime serviceStopTime	
context.facilityType CodeableConcept [0..1]		healthcareFacilityType code	

FHIR DocumentReference Resource Definition	IHE constraint	Document Sharing Metadata	Notes
context.practiceSetting CodeableConcept [0..1]		practiceSettingCode	
context.sourcePatientInfo Reference(Patient) [0..1]	Note 1	sourcePatientId and sourcePatientInfo	Contained Patient resource with Patient.identifier.use element set to 'usual'..
context.related [0..*]			
context.related.identifier Identifier [0..1]		referenceIdList	See ITI TF-2x: Appendix E.3.1 on CXi mapping to FHIR Identifier.
context.related.ref Reference(Any) [0..1]		referenceIdList	May be filled with URL pointers to Resources found in referenceIdList.
		homeCommunityId	Not Applicable ^{Note 2}
		limitedMetadata	Not Applicable ^{Note 2}
		objectType	Not Applicable ^{Note 2}
		repositoryUniqueId	Not Applicable ^{Note 2}

1155 Note 1: Indicates that the data within the XDS document entry be represented as a contained resource. See Section 4.5.4.4.7

Note 2: Not Applicable - The Document Sharing metadata element has no equivalent element in the HL7 FHIR STU3; therefore, a Document Source is not able to set these elements, and Document Consumers will not have access to these elements.

1160 Note 3: These HL7 FHIR STU3 elements are not used in XDS; therefore, they would not be present. Document Consumers should be robust to these elements holding values.

4.5.1.2 SubmissionSet Metadata Attributes

Table 4.5.1.2-1 provides a mapping of the metadata attributes associated with a Document Sharing SubmissionSet object to FHIR DocumentManifest Resource. The full SubmissionSet metadata attribute definition is in Section 4.2.3.3.

1165 Note: FHIR contains an informative mapping that is intended to be equivalent to Table 4.5.1.2-1 found at <http://hl7.org/fhir/STU3/documentmanifest-mappings.html#xds>.

Table 4.5.1.2-1: FHIR DocumentManifest mapping to SubmissionSet

FHIR DocumentManifest Resource Definition	IHE constraint	Document Sharing metadata	Notes
DocumentManifest		Submission Set	
text Narrative [0..1]		text	String only, no markup allowed
masterIdentifier Identifier [0..1]	[1..1]	uniqueId	
identifier Identifier [0..*]		entryUUID	

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FHIR DocumentManifest Resource Definition	IHE constraint	Document Sharing metadata	Notes
subject Reference(Patient Practitioner Group Device) [0..1]	Reference(Patient)	patientId,	Not a contained resource. URL Points to an existing Patient Resource representing Affinity Domain Patient.
recipient Reference(Patient Practitioner RelatedPerson Organization) [0..*]		intendedRecipient	
type CodeableConcept [0..1]		contentTypeCode	
author Reference(Practitioner Organization Device Patient RelatedPerson) [0..*]	Reference(Practitioner Organization) Note 1	author	Contained resource of type Practitioner or Organization with: <ul style="list-style-type: none"> authorInstitution: Organization For Practitioner, also with: authorPerson: Practitioner.identifier and Practitioner.name authorRole:—Not supported in STU3 authorSpecialty: Practitioner.qualification authorTelecommunication: Practitioner.telecom
created dateTime [0..1]	[1..1]	submissionTime	
source uri [0..1]	[1..1]	sourceId	
status code {DocumentReferenceStatus} [1..1]		availabilityStatus	approved → status=current
description string [0..1]		title	
content [1..*]			References to DocumentReference Resources representing DocumentEntry objects in the SubmissionSet.
content.pAttachment	[0..0]		Not Used ^{Note 3}
content.pReference Reference(Any) [1..1]	Reference(DocumentReference)		
related [0..*]	[0..0]		Not Used ^{Note 3}

FHIR DocumentManifest Resource Definition	IHE constraint	Document Sharing metadata	Notes
related.identifier Identifier [0..1]	[0..0]		Not Used ^{Note 3}
related.ref Reference(Any) [0..1]	[0..0]		Not Used ^{Note 3}
		homeCommunityId	Not Applicable ^{Note 2}
		limitedMetadata	Not Applicable ^{Note 2}

Note 1: Indicates that the data within the XDS SubmissionSet metadata be represented as a contained resource. See Section 4.5.4.4.7.

1170

Note 2: Not Applicable - The Document Sharing metadata element has no equivalent element in the HL7 FHIR STU3; therefore, a Document Source is not able to set these elements, and Document Consumers will not have access to these elements.

Note 3: These HL7 FHIR STU3 elements are not used in XDS; therefore, they would not be present. Document Consumers should be robust to these elements holding values.

1175 4.5.1.3 Folder Metadata Attributes

Table 4.5.1.3-1 provides a mapping of the metadata attributes associated with a Document Sharing Folder object to a FHIR List Resource. The full Folder metadata attribute definition is in Section 4.2.3.4.

Note that FHIR List Resource does not include a Mapping to XDS.

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Table 4.5.1.3-1: FHIR List mapping to Folder metadata

FHIR List Resource Definition	IHE constraint	Document Sharing Metadata	Notes
List		Folder	
identifier Identifier [0..*]	[2..2]	uniqueId, entryUUID	When the List.identifier carries the entryUUID, then the List.identifier.use shall be 'official'. When the List.identifier carries the uniqueId, then the List.identifier.use shall be 'usual'.
title string [0..1]		title	
code CodeableConcept [0..1]		codeList	code.coding is [0..*] so may contain many.

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FHIR List Resource Definition	IHE constraint	Document Sharing Metadata	Notes
subject Reference(Patient Group Device Location) [0..1]	Reference(Patient)	patientId,	URL Points to an existing Patient resource representing Affinity Domain Patient
source Reference(Practitioner Patient Device) [0..1]	[0..0]		Not Used ^{Note 3}
encounter Reference(Encounter) [0..1]	[0..0]		Not Used ^{Note 3}
status code [1..1]		availabilityStatus	
date dateTime [0..1]		lastUpdateTime	
orderedBy CodeableConcept [0..1]	[0..0]		Not Used ^{Note 3}
mode code [1..1]	shall be 'working'		
note Annotation [0..*]		comments	
entry [0..*]			References to DocumentReference Resources found in the Folder
entry.flag CodeableConcept [0..1]	[0..0]		Not Used ^{Note 3}
entry.deleted Boolean [0..1]	[0..0]		Not Used ^{Note 3}
entry.date dateTime [0..1]	[0..0]		Not Used ^{Note 3}
entry.item Reference(Any) [1..1]	Reference(DocumentReference)		
emptyReason CodeableConcept [0..1]	[0..0]		Not Used ^{Note 3}
		homeCommunityId	Not Applicable ^{Note 2}

Note 1: Indicates that the data within the XDS Folder metadata be represented as a contained resource. See Section 4.5.4.4.7.

Note 2: Not Applicable - The Document Sharing metadata element has no equivalent element in the HL7 FHIR STU3; therefore, a Document Source is not able to set these elements, and Document Consumers will not have access to these elements.

Note 3: These HL7 FHIR STU3 elements are not used in XDS; therefore, they would not be present. Document Consumers should be robust to these elements holding values.

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