IHE.ITI.MHD\2:3.65 Provide Document Bundle [ITI-65]

http://hl7.org/fhir

This page is part of the IHE Mobile Access to Health Documents (v4.1.0: Trial Implementation) based on FHIR R4. This is the current published version. For a full list of available versions, see the Directory of published versions

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.

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

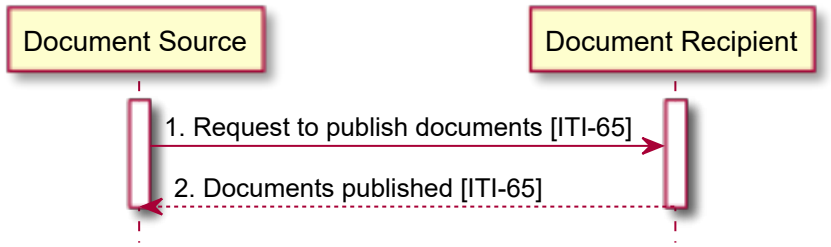

Figure 2:3.65.4-1: Provide Document Bundle Interactions

2:3.65.4.1 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.

2:3.65.4.1.1 Trigger Events

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

2:3.65.4.1.2 Message Semantics

The Document Source shall initiate a FHIR “transaction” using a “create” action by sending an HTTP POST request method composed of a FHIR Bundle Resource containing: one SubmissionSet type List Resource; one or more DocumentReference Resources; zero or more Folder type 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`.

See http://hl7.org/fhir/R4/http.html#transaction for complete requirements of a transaction. See http://hl7.org/fhir/R4/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/R4/http.html for the definition of "HTTP" access methods and "base".

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". The Document Source shall not provide any entryUUID values.

2:3.65.4.1.2.1 Bundle Resources

For complete information on constructing a FHIR Bundle Resource, see http://hl7.org/fhir/R4/bundle.html.

The FHIR Bundle.meta.profile shall have the following value depending on the Actor implementation of no options (Minimal Metadata), Comprehensive Metadata Option, or UnContained References Option:

- Minimal Metadata: `https://profiles.ihe.net/ITI/MHD/StructureDefinition/IHE.MHD.Minimal.ProvideBundle`
  - shall be a Transaction Bundle
  - all resources shall be compliant with minimal constraints, they may be marked minimal, comprehensive, or unContained
  - shall create a SubmissionSet type List that is either minimal, comprehensive, or unContained
  - may create one or more DocumentReference that is either minimal, comprehensive, or unContained
  - may create one or more Binary
  - may create/update one or more Folder type List that is either minimal, comprehensive, or unContained
  - may create/update/read one Patient
- Comprehensive Metadata: `https://profiles.ihe.net/ITI/MHD/StructureDefinition/IHE.MHD.Comprehensive.ProvideBundle`
  - this is otherwise known as XDS-on-FHIR
  - shall be a Transaction Bundle
  - all resources shall be compliant with comprehensive constraints, they may be marked comprehensive
  - shall create a SubmissionSet type List that is comprehensive
  - may create one or more DocumentReference that is comprehensive
  - may create one or more Binary
  - may create/update one or more Folder type List that is comprehensive
  - may create/update/read one Patient
- UnContained Comprehensive Metadata: `https://profiles.ihe.net/ITI/MHD/StructureDefinition/IHE.MHD.UnContained.Comprehensive.ProvideBundle`
  - note that Minimal Metadata does not require containment, so UnContained Minimal is the same as Minimal Metadata
  - note that UnContained only applies to DocumentReference and

SubmissionSet type Lists; so the following apply
    - shall be a Transaction Bundle
    - all resources shall be compliant with comprehensive unContained constraints, they may be marked comprehensive unContained
    - shall create a SubmissionSet type List that is comprehensive or unContained
    - may create one or more DocumentReference that is comprehensive or unContained
    - may create one or more Binary
    - may create/update one or more Folder type List that is comprehensive
    - may create/update/read one Patient

When resources are `contained` , see ITI TF-3: 4.5.1, they shall be contained using the FHIR contained method (see http://hl7.org/fhir/R4/references.html#contained).

When the DocumentReference.content.attachment.url points at a Binary Resource, the Binary Resource shall be in the Bundle. See FHIR Resolving references in Bundles at http://hl7.org/fhir/R4/bundle.html#references.

The Document Source shall populate accurate .hash and .size for the document content:

- Where the document content is a Binary Resource instance, the .hash and .size measure the raw artifact that has been base64encoded in the Binary.data element.
- Where the document content is hosted elsewhere, not as a Binary Resource, the .hash and the .size shall represent the document content that would be retrieved using the mime-type specified in contentType element.
- Where the document content is On-Demand Document Option, the .hash and the .size shall be absent from the DocumentReference Resource. See On-Demand Document Use Cases Summary.
- Where the document content is Delayed Document Assembly, the .size of `0` (zero), and the .hash with the fixed value `da39a3ee5e6b4b0d3255bfef95601890afd80709` (SHA1 hash of a zero length file).

Folders may be created or updated. A Document Recipient may require that an Updated Folder only have new .entry elements added as would be the requirement of XDS.

Patient would typically only be allowed by the Document Recipient in PUSH interaction situations, but may be accepted for other reasons at the discretion of the Document Recipient actor policy.

2:3.65.4.1.2.2 Patient Identity

All DocumentReference.subject, and List.subject values shall be References to a FHIR Patient Resource that may be obtained through use of PDQm, PIXm, or by some other means. If the Patient Resource is accessible to both the Document Source and Document Recipient via an external reference, it shall be included as an external reference. Otherwise, the Patient Resource shall be included in the Bundle.

When the UnContained Reference Option is used, there is no need to populate the sourcePatientInfo element. Otherwise, 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 within the DocumentReference.contained element (see http://hl7.org/fhir/R4/references.html#contained).

2:3.65.4.1.2.3 Replace, Transform, Signs, and Append Associations

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/R4/valueset-document-relationship-type.html.

2:3.65.4.1.3 Expected Actions

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 the response Message Semantics.

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/R4/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/R4/validation.html.

The Document Recipient should 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 should validate against column "XDS DS";
- Otherwise the Document Recipient should validate against column "XDR MS".

A Document Recipient is allowed to be robust for non-compliant resources that violate the the Document Sharing metadata requirements.

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 Provide Document Bundle Response Message. If appropriate, it shall use error codes from ITI TF-3: Table 4.2.4.1-2.

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 given, it shall return a warning message, as indicated in *Table 2:3.65.4.1.3-1: Warning message when relatesTo code is not supported*.

Table 2:3.65.4.1.3-1: Warning message when relatesTo code is not supported

relatesTo.code	Warning
replaces	PartialReplaceContentNotProcessed
transforms	PartialTransformContentNotProcessed
appends	PartialAppendContentNotProcessed

If the Provide Document Bundle Message contains a Folder type List Resource and the Document Recipient does not support the Folder type List Resource (aka, Folders), the Document Recipient shall either fail the whole transaction or may ignore the Folder type List, continuing processing of the transaction, and return a "PartialFolderContentNotProcessed" warning.

If the SubmissionSet `intendedRecipient` is populated, the Document Recipient SHALL make reasonable efforts to determine whether each recipient can be notified, but MAY return success before confirming full receipt and processing by the intendedRecipients. A Document Recipient MAY delegate notification of some or all intendedRecipients, for example, by grouping with an XCDR Initiating Gateway that pushes to XCDR Responding Gateways. If notification of an intendedRecipient is not possible, the Document Recipient MAY do any of the following (the Error/Warning codes are defined in section 3:4.2.4.1):

- Fail the transaction and return the code `UnknownRecipient` or `UnavailableRecipient` as an error
- Succeed and return the code `UnknownRecipient` or `UnavailableRecipient` as a warning
- Succeed silently

If the recipient is known to be an XDR/XCDR community, the error codes `XDSUnknownCommunity` or `XDSUnavailableCommunity` may be used instead.

2:3.65.4.1.3.1 Grouping with Actors in other Document Sharing Profiles

This section applies to grouping MHD Document Recipient with XDS Document Source Actor, XDR Document Source Actor, XDR Limited-Metadata Document Source Actor, and XDM Portable Media Creator Actor (e.g. with the XDM ZIP over Email Option).

The Document Recipient shall transform the Bundle content into a proper message for the Given grouped Actor (e.g. the XDS Document Source using 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, Folder, and Associations.

If the Provide Document Bundle Message contains a DocumentReference with a relatesTo element, the code shall be translated using the AssociationType vs RelatesTo ConceptMap.

The Document Recipient shall map Folder type List Resources in the Bundle Resource to XDS Folders, as specified in ITI TF-3: 4.5.1.1. The Document Registry may apply further constraints on Folder content and revision, for example removal of entries from Folders is not generally allowed.

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

Upon successful conversion of the FHIR Bundle to XDS Document Sharing metadata, the grouped source actor shall execute the appropriate 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 response to the appropriate HTTP Status Code and FHIR OperationOutcome Resource in the Provide Document Bundle Response Message.

2:3.65.4.2 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/R4/http.html#transaction.

2:3.65.4.2.1 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.

2:3.65.4.2.2 Message Semantics

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 results of processing the entry warnings such as PartialFolderContentNotProcessed. The Document Recipient shall comply with FHIR http://hl7.org/fhir/R4/bundle.html#transaction-response and http://hl7.org/fhir/R4/http.html#transaction-response.

To indicate success the overall http `200` response is used. The `Bundle.entry.response.status` shall be `201` to indicate the Resource has been created, the `.location` element shall be populated, and the `.etag` element may be populated when the Document Recipient supports FHIR resource versioning.

An informative StructureDefinition is outlined for MHD Provide Bundle Document Response Message, with an example.

2:3.65.4.2.3 Expected Actions

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.

2:3.65.4.3 CapabilityStatement Resource

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

- General Requirements CapabilityStatement for Document Recipient. This indicates that either no options are declared or that all options are declared.
- Requirements CapabilityStatement for Document Recipient Comprehensive Metadata Option. This indicates that the Comprehensive Metadata Option is declared. Note that XDS-on-FHIR Option requires Comprehensive and thus this Requirements CapabilityStatement applies to XDS-on-FHIR also.
- Requirements CapabilityStatement for Document Recipient UnContained References Option. This indicates that the UnContained Option is declared.

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

- General Requirements CapabilityStatement for Document Source. This indicates that either no options are declared or that all options are declared.
- Requirements CapabilityStatement for Document Source Comprehensive Metadata Option. This indicates that the Comprehensive Metadata Option is declared. Note that XDS-on-FHIR Option requires Comprehensive and thus this Requirements CapabilityStatement applies to XDS-on-FHIR also.
- Requirements CapabilityStatement for Document Source UnContained References Option. This indicates that the UnContained Option is declared.

2:3.65.5 Security Considerations

See MHD Security Considerations.

2:3.65.5.1 Security Audit Considerations

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.

2:3.65.5.1.1 Document Source Audit

The Document Source when grouped with ATNA Secure Node or Secure Application actor shall be able to record a Provide Audit Bundle Source Audit Event Log. Audit Example for a Provide Bundle Transaction from source perspective.

2:3.65.5.1.2 Document Recipient Audit

The Document Recipient when grouped with ATNA Secure Node or Secure Application actor shall be able to record a Provide Audit Bundle Recipient Audit Event Log. Audit Example for a Provide Bundle Transaction from recipient perspective.

IHE.ITI.MHD\2:3.66 Find Document Lists [ITI-66]

http://hl7.org/fhir

This page is part of the IHE Mobile Access to Health Documents (v4.1.0: Trial Implementation) based on FHIR R4. This is the current published version. For a full list of available versions, see the Directory of published versions

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 submission sets or folders.

The Find Document Lists [ITI-66] transaction is used to find List Resources that satisfy a set of parameters. It is equivalent to the:

The result of the query is a Bundle containing List Resources that match the query parameters.

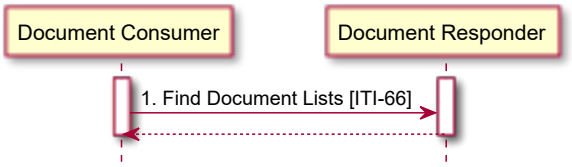

Figure 2:3.66.4-1: Find Document Lists Interactions

2:3.66.4.1 Find Document Lists Request message

This message uses the search method parameterized query to obtain List Resources from the Document Responder.

2:3.66.4.1.1 Trigger Events

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

2:3.66.4.1.2 Message Semantics

The Document Consumer executes an HTTP search against the Document Responder List endpoint. The search target follows the FHIR HTTP specification, addressing the List Resource http://hl7.org/fhir/R4/http.html:

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 well as control parameters to modify the behavior of the Document Responder such as response format, or pagination.

The Document Consumer may use GET or POST based searches. The Document Responder shall support both GET and POST based searches http://hl7.org/fhir/R4/http.html#search.

2:3.66.4.1.2.1 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.

The Document Consumer shall include search parameter `patient` or `patient.identifier`, `code`, 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/R4/search.html#errors.

code: This parameter, of type token, specifies the code.coding value supplied in the List Resource. The value of the code element indicates the List of type SubmissionSet or Folder as indicated.

date: This parameter, of type date, specifies the time when the List was created. See FHIR http://hl7.org/fhir/R4/search.html#date for use of the date search type.

designationType: This IHE extension on parameters defined as List-DesignationType, of type token, specifies the designation type of the List. The value of the designation type element expresses contentType of submissionSet or the codeList of a Folder. Usually expressed in LOINC or SNOMED. Note that servers that do not support this extended search parameter

will ignore it, and thus return more results than expected.

identifier: This parameter, of type token, specifies an identifier for this List. The search results represent the results of a search on List.identifier. See ITI TF-2x: Appendix Z.2 for additional constraints on the use of the token search parameter type.

patient: 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. When the patient parameter is used, the Patient reference would need to be accessible to both the Document Consumer and the Document Responder.

patient.identifier: This parameter, of type token, specifies an identifier associated with the patient to which the List Resource is assigned. See ITI TF-2x: Appendix Z.2 for use of the token data type for identifiers. This use of **patient.identifier** follows the FHIR Chaining Parameters search methodology.

source.given and source.family: These parameters, of type string, specify the name parts of the author person which is associated with the List. See ITI TF-2x: Appendix Z.2 for use of the string data type. This use of **source.given** and **source.family** follows the FHIR Chaining Parameters search methodology.

sourceId: This IHE extension on parameters defined as List-SourceId, of type token, specifies the source (author) value supplied in the List Resource.

status: This parameter, of type token, specifies the status of the List. If included in the query, the Document Consumer shall populate the code portion of the token with one of the codes in the following *Table 2:3.66.4.1.2.1-1: Values for code for status of List*. The system portion of the token shall not be populated.

Table 2:3.66.4.1.2.1-1: Values for code for status of List

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

2:3.66.4.1.2.2 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.

2:3.66.4.1.2.3 Example List search

For example given:

- FHIR server root is `http://test.fhir.org/R4/fhir`
- Patient reference id is `9876`
- looking for a SubmissionSet
- status of current
- with clinical code from loinc of `1234-5`
- examples do not include all http headers such as the security headers

2:3.66.4.1.2.3.1 Example GET

```
GET test.fhir.net/R4/fhir/List?patient=9876&code=submissionset&status=current&designationType=http://loinc.org|1234-5
```

2:3.66.4.1.2.3.2 Example POST

```
POST test.fhir.net/R4/fhir/List/_search?patient=9876&code=submissionset&status=current&designationType=http://loinc.org|1234-5
```

2:3.66.4.1.2.3.3 Example POST body

```
POST test.fhir.net/R4/fhir/List/_search
Content-Type: application/x-www-form-urlencoded

patient=9876&code=submissionset&status=current&designationType=http://loinc.org|1234-5
```

2:3.66.4.1.3 Expected Actions

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

2:3.66.4.1.3.1 XDS on FHIR Option

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 2:3.66.4.1.3.1-1 and shall execute a Registry Stored Query [ITI-18] for FindSubmissionSets or FindFolders. No additional query parameters as defined in FHIR are required of the

Document Responder.

Table 2:3.66.4.1.3.1-1: FindSubmissionSets Query Parameter Mapping

ITI-66 Parameter Name	ITI-18 Parameter Name
code	“submissionset”
patient or patient.identifier	$XDSSubmissionSetPatientId
date (Note 1)	$XDSSubmissionSetSubmissionTimeFrom
date (Note 2)	$XDSSubmissionSetSubmissionTimeTo
source.given / source.family	$XDSSubmissionSetAuthorPerson
designationType	$XDSSubmissionSetContentType
sourceId	$XDSSubmissionSetSourceId
status	$XDSSubmissionSetStatus

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

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

Table 2:3.66.4.1.3.1-2: FindFolders Query Parameter Mapping

ITI-66 Parameter Name	ITI-18 Parameter Name
code	“folder”
patient or patient.identifier	$XDSFolderPatientId
date (Note 1)	$XDSFolderLastUpdateTimeFrom
date (Note 2)	$XDSFolderLastUpdateTimeTo
designationType	$XDSFolderCodeList
status	$XDSFolderStatus

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

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

Note 3: Parameters specific to “submissionset” shall be silently ignored.

Translation of Token Parameter

Query parameters of type token are used to represent codes and identifiers. See https://www.hl7.org/fhir/R4/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-2: 3.18.4.1.2.3.7.2).

- 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^^^&amp;system&amp;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

Translation of Name Components

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

```
…&source.given=Marcus&source.family=Welby
```

would translate to:

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

2:3.66.4.2 Find Document Lists Response message

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

2:3.66.4.2.1 Trigger Events

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

2:3.66.4.2.2 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.

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/R4/http.html and http://hl7.org/fhir/R4/operationoutcome.html.

If the Find Document Lists message is processed successfully, whether or not any List Resources are found, the HTTP status code shall be 200. The Find Document Lists Response message shall be a Bundle Resource containing zero or more List 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.

An informative StructureDefinition is outlined for MHD Find Document Lists Response message, with an example.

List Resource Contents

The List Resources returned shall be compliant with the FHIR specification http://hl7.org/fhir/R4/list.html.

The List Resources returned will be compliant with the IHE restrictions on the List Resource and with the mapping of ebXML attributes to List elements to SubmissionSet and to Folder.

2:3.66.4.2.3 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 shall process the results according to application-defined rules. The Document Consumer should be robust as the response may contain List Resources that match the query parameters but are not compliant with the List constraints defined in ITI TF-3: 4.5.

2:3.66.4.3 CapabilityStatement Resource

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

- Requirements CapabilityStatement for Document Consumer
- Requirements CapabilityStatement for Document Responder

2:3.66.5 Security Considerations

See MHD Security Considerations.

This transaction should not return information that the Document Consumer is not authorized to access. Where authorization here is inclusive of system, app, and user according to local policy, patient consents, and security layering. However, the transaction may return List resources that have Reference elements that the Document Consumer may not have access to. This is to say that the authorization need only be to the content returned in the Bundle. There may be references (URLs) for which the content is not authorized. This is considered proper as the Document Consumer would need to retrieve the content pointed to by those references, and at that time the proper authorization decision would be made on that context and content. In this way it is possible for a Document Consumer to get List Resources that are pointing at data that the Document Consumer is not authorized to retrieve. Thus, the URLs used must be carefully crafted so as to not expose sensitive data in the URL value.

2:3.66.5.1 Security Audit Considerations

The security audit criteria are similar to those for the Registry Stored Query ITI-18 transaction.

2:3.66.5.1.1 Document Consumer Audit

The Document Consumer when grouped with ATNA Secure Node or Secure Application actor shall be able to record a Find Document Lists Consumer Audit Event Log. Audit Example for a Find Document Lists transaction from consumer perspective.

2:3.66.5.1.2 Document Responder Audit

The Document Responder when grouped with ATNA Secure Node or Secure Application actor shall be able to record a Find Document Lists Responder Audit Event Log. Audit Example for a Find Document Lists Transaction from responder perspective.

IHE.ITI.MHD\2:3.67 Find Document References [ITI-67]

http://hl7.org/fhir

This page is part of the IHE Mobile Access to Health Documents (v4.1.0: Trial Implementation) based on FHIR R4. This is the current published version. For a full list of available versions, see the Directory of published versions

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.

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.

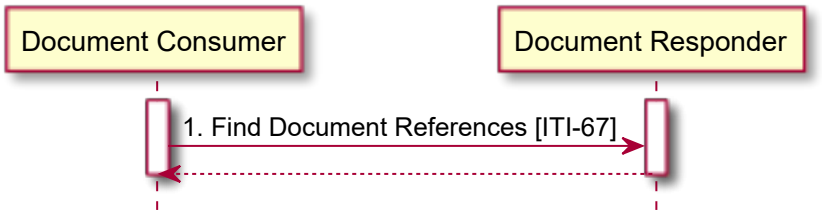

Figure 2:3.67.4-1: Find Document References Interactions

2:3.67.4.1 Find Document References Request message

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

2:3.67.4.1.1 Trigger Events

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

2:3.67.4.1.2 Message Semantics

The Document Consumer executes an HTTP search against the Document Responders DocumentReference URL. The search target follows the FHIR HTTP specification, addressing the DocumentReference Resource http://hl7.org/fhir/R4/http.html:

```
[base]/DocumentReference?<query>
```

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 Query Search Parameters, as well as control parameters to modify the behavior of the Document Responder such as response format, or pagination.

The Document Consumer may use GET or POST based searches. The Document Responder shall support both GET and POST based searches http://hl7.org/fhir/R4/http.html#search.

2:3.67.4.1.2.1 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.

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 additional parameters are considered out of scope for this transaction. Any additional parameters not supported should be ignored. See http://hl7.org/fhir/R4/search.html#errors.

author.given and **author.family**: These parameters, of type string, specify the name parts of the author person, which is associated with the DocumentReference Resource, or in Document Sharing nomenclature, the author of the Document Entry. See ITI TF-2x: Appendix Z.2 for use of the string data type. This use of **author.given** and **author.family** follows the FHIR Chaining Parameters search methodology.

category: This parameter, of type token, specifies the general classification of the DocumentReference Resource, or in Document Sharing nomenclature, the classCode of the Document Entry. See ITI TF-2x: Appendix Z.2 for additional constraints on the use of the token search parameter type.

creation: This IHE defined parameter defined as DocumentReference-Creation, of type dateTime, specifies a search against the DocumentReference.content.attachment.creation. See FHIR http://hl7.org/fhir/R4/search.html#date for use of the date search type.

date: This parameter, of type date, specifies the time when the DocumentReference was created. See FHIR http://hl7.org/fhir/R4/search.html#date for use of the date search type.

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

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

parameter type.

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

identifier: This parameter, of type token, specifies an identifier for this DocumentReference and/or the contained document. The search results represent the results of a search on DocumentReference.masterIdentifier and DocumentReference.identifier. See ITI TF-2x: Appendix Z.2 for additional constraints on the use of the token search parameter type.

patient: This parameter is of type Reference(Patient). The Document Consumer may get this reference using the PDQm or PIXm Profile. When the patient parameter is used, the Patient reference would need to be accessible to both the Document Consumer and the Document Responder.

patient.identifier: This parameter, of type token, specifies an identifier associated with the patient to which the DocumentReference Resource is assigned. See ITI TF-2x: Appendix Z.2 for additional constraints on the use of the token search parameter type. This use of **patient.identifier** follows the FHIR Chaining Parameters search methodology.

period: 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/R4/search.html#date for use of the date search type.

related: This parameter, of type reference, represents other identifiers associated with the DocumentReference Resource, or in Document Sharing nomenclature, the referenceIdList of the Document Entry.

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

setting: 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.

status: This parameter, of type token, specifies the status of the DocumentReference Resource, or in Document Sharing nomenclature, the availabilityStatus of the Document Entry. The Document Consumer shall populate the identifier portion of the token using one of the short codes in Table 2:3.67.4.1.2.1-1. The system portion of the token shall not be populated.

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

2:3.67.4.1.2.2 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.

2:3.67.4.1.2.3 Example DocumentReference search

For example given:

- FHIR server root is `http://test.fhir.org/R4/fhir`
- Patient reference id is `9876`
- status of current
- with clinical code from loinc of `1234-5`
- examples do not include all http headers such as the security headers

2:3.67.4.1.2.3.1 Example GET

```
GET test.fhir.net/R4/fhir/DocumentReference?patient=9876&status=current&type=htt
```

2:3.67.4.1.2.3.2 Example POST

```
POST test.fhir.net/R4/fhir/DocumentReference/_search?patient=9876&status=current
```

2:3.67.4.1.2.3.3 Example POST body

```
POST test.fhir.net/R4/fhir/DocumentReference/_search
Host test.fhir.net
Content-Type: application/x-www-form-urlencoded
Accept: application/fhir+json; fhirVersion=4.0

patient=9876&status=current&type=http://loinc.org|1234-5
```

2:3.67.4.1.3 Expected Actions

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

2:3.67.4.1.3.1 XDS on FHIR Option

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 2:3.67.4.1.3.1-1 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.

Table 2:3.67.4.1.3.1-1: ITI-18 FindDocuments Query Parameter Mapping

ITI-67 Parameter Name	ITI-18 Parameter Name

ITI-67 Parameter Name	ITI-18 Parameter Name
patient or patient.identifier	$XDSDocumentEntryPatientId
creation (Note 1) (Note 5)	$XDSDocumentEntryCreationTimeFrom
creation (Note 2) (Note 5)	$XDSDocumentEntryCreationTimeTo
author.given / author.family	$XDSDocumentEntryAuthorPerson
status	$XDSDocumentEntryStatus
(Not supported) (Note 3)	$XDSDocumentEntryType
category	$XDSDocumentEntryClassCode
type	$XDSDocumentEntryTypeCode
setting	$XDSDocumentEntryPracticeSettingCode
period (Note 1)	$XDSDocumentEntryServiceStartTimeFrom
period (Note 2)	$XDSDocumentEntryServiceStartTimeTo
period (Note 1)	$XDSDocumentEntryServiceStopTimeFrom
period (Note 2)	$XDSDocumentEntryServiceStopTimeTo
facility	$XDSDocumentEntryHealthcareFacilityTypeCode
event	$XDSDocumentEntryEventCodeList
security-label	$XDSDocumentEntryConfidentialityCode
format	$XDSDocumentEntryFormatCode
related (Note 4)	$XDSDocumentEntryReferenceIdList

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

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

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

Note 4: The $XDSDocumentEntryReferenceIdList can only be mapped when using the XDS FindDocumentsByReferenceId query. This parameter support requires XDS Reference ID Option.

Note 5: The FHIR DocumentReference does not yet have a query parameter for creationTime of the document, it has only a date element which is the creation date/time of the DocumentReference. For FHIR R4 we align these two elements so that query will function.

Table 2:3.67.4.1.3.1-2: 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

2:3.67.4.2 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.

2:3.67.4.2.1 Trigger Events

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

2:3.67.4.2.2 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.

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/R4/http.html and http://hl7.org/fhir/R4/operationoutcome.html.

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. The response bundle for a MHD Find Document References Comprehensive Response is defined here, with an example.

2:3.67.4.2.2.1 DocumentReference Resource Contents

The DocumentReference Resources returned shall be compliant with the FHIR specification http://hl7.org/fhir/R4/documentreference.html.

The DocumentReference Resources returned will be compliant with the MHD metadata for the IHE restrictions on DocumentReference Resource and with the mapping to DocumentEntry from IHE Document Sharing profiles (e.g., XDS) to FHIR.

2:3.67.4.2.2.1.1 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. There are many ways to encode this URL that allow for easy processing on a Retrieve Document transaction. Some examples are to encode homeCommunityId, repositoryUniqueId, uniqueId, and patientId into the URL. This could be done in many ways including using character separators or directory separators. In this way, the Document Responder can support many communities, and/or many repositories.

2:3.67.4.2.2.1.2 Support for On-Demand Documents

XDS introduced the concept of a On-Demand Document Option, and is explained in the Use Cases Summary. The use of On-Demand Documents allows for documents that would be produced for a specific patient with content assembled at the time of processing the document consumer retrieve request.

On-Demand Documents are indicated in the DocumentReference by the DocumentReference.content.attachment with an absent .hash and .size element. For more background on On-Demand Documents. There is no need to declare an On-Demand Documents Option in MHD.

Informative note: When the Document Consumer retrieves the document using the Document location, then the retrieved document might exist as an IsSnapshotOf Association according to XDS ITI-43. The IsSnapshotOf Association is identified as a new DocumentReference with relatesTo.code of `transforms`.

2:3.67.4.2.2.1.3 Support for Delayed Document Assembly

XDS introduced the concept of Delayed Document Assembly Option, and is explained in the Use Cases Summary. The use of Delayed Document Assembly allows source systems to register the existence of stable document content but defer actually assembling the document content only if and when it is retrieved.

Delayed Document Assembly is distinct from On-Demand Documents in that Delayed Document Assembly is a Documents that are static, clinician attested documents and the content of the document is identified prior to registration of the Document Entry. On-Demand Documents allows the content of the document to be identified at the time of receipt of the retrieval request (e.g., summary, or current). Delayed Document Assembly has been designed to be as transparent as possible to Document Consumer Actors. Document Consumers Actors may easily support Stable Documents whose assembly has been delayed just as if they were a regular Stable Document since the only constraint on Document Consumers brought by this Delayed Document Assembly Option is to support responses to queries with the presence of Stable Document Entries that have zero size and hash values.

Delayed Document Assembly are indicated in the DocumentReference by the DocumentReference.content.attachment with an .size element of `0` (zero), and a .hash element with the fixed value `da39a3ee5e6b4b0d3255bfef95601890afd80709` (SHA1 hash of a zero length file). For more background on the Delayed Document Assembly. There is no need to declare a Delayed Document Assembly in MHD.

Informative note: When the Document Consumer retrieves the document using the Document location, then the retrieved document actual size and hash is updated in the DocumentReference. In this way the Document Consumer may

retrieve the updated DocumentReference after successful retrival of the document to find the size and hash for content integrity validation.

2:3.67.4.2.2.1.4 XDS Associations

Where the documentReference Resource being returned has an XDS Association, this shall be represented in the DocumentReference.relatesTo element. Where the DocumentReference.relatesTo.target element holds the Reference to the other DocumentReference Resource, and the DocumentReference.relatesTo.code element holds the relationship type translated using the AssociationType vs RelatesTo ConceptMap.

2:3.67.4.2.2.2 Resource Bundling

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

2:3.67.4.3 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 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 here.

2:3.67.4.4 CapabilityStatement Resource

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

- Requirements CapabilityStatement for Document Consumer
- Requirements CapabilityStatement for Document Responder

2:3.67.5 Security Considerations

See MHD Security Considerations.

This transaction should not return information that the Document Consumer is not authorized to access. Where authorization here is inclusive of system, app, and user according to local policy, patient consents, and security layering. However, the transaction may return DocumentReference resources that have Reference elements that the Document Consumer may not have access to. This is to say that the authorization need only be to the content returned in the Bundle. There may be references (URLs) for which the content is not authorized. This is considered proper as the Document Consumer would need to retrieve the content pointed to by those references, and at that time the proper authorization decision would be made on that context and content. In this way it is possible for a Document Consumer to get DocumentManifest resources that are pointing at data that the Document Consumer is not authorized to retrieve. Thus, the URLs used must be carefully crafted so as to not expose sensitive data in the URL value.

Given that the Document Responder is responsible for the URL placed into DocumentReference.content.attachment.url, care must be taken to assure that manipulation of this URL prior to a Retrieve Document transaction does not expose resources the Document Consumer should not have access to.

2:3.67.5.1 Security Audit Considerations

The security audit criteria are similar to those for the Registry Stored Query ITI-18 transaction.

2:3.67.5.1.1 Document Consumer Audit

The Document Consumer when grouped with ATNA Secure Node or Secure Application actor shall be able to record a Find Document References Consumer Audit Event Log. Audit Example for a Find Document References transaction from consumer perspective.

2:3.67.5.1.2 Document Responder Audit

The Document Responder when grouped with ATNA Secure Node or Secure Application actor shall be able to record a Find Document References Responder Audit Event Log. Audit Example for a Find Document Lists Transaction from responder perspective.

IHE.ITI.MHD\2:3.68 Retrieve Document [ITI-68] - FHIR v4.0.1

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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.

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

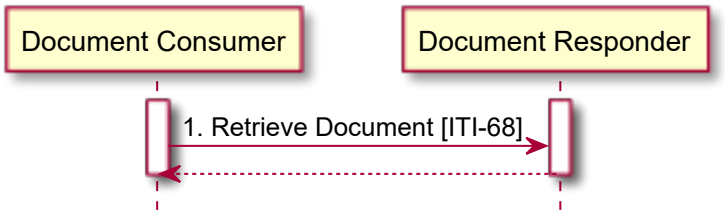

Figure 2:3.68.4-1: Retrieve Document Interactions

2:3.68.4.1 Retrieve Document Request Message

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

2:3.68.4.1.1 Trigger Events

The Document Consumer wants to obtain a document.

2:3.68.4.1.2 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.

The Document Consumer may provide HTTP Accept header, according to the semantics of the HTTP protocols (see RFC2616, Section 14.1). This enables the Document Consumer to indicate prefered mime-types such that the Document Responder could provide the document requested in an encoding other than the encoding indicated in the DocumentReference. For example, indicating `application/fhir+json` could result in the response from the Document Responder being a json FHIR Bundle of type `document` with all the content encoded as FHIR resources.

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.

2:3.68.4.1.3 Expected Actions

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.

2:3.68.4.2 Retrieve Document Response Message

This is the return message sent by the Document Responder.

2:3.68.4.2.1 Trigger Events

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

2:3.68.4.2.2 Message Semantics

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 2:3.68.4.2.2-1 contains error situations and the HTTP Response.

Table 2:3.68.4.2.2-1: 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

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.

2:3.68.4.2.3 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.

The .hash and .size, when populated, represent the content in the MIME type indicated in the DocumentReference.content.attachment.contentType. Note there are special .size and .hash handling for On-Demand Documents and Delayed Document Assembly.

2:3.68.4.3 CapabilityStatement Resource

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

- Requirements CapabilityStatement for Document Consumer
- Requirements CapabilityStatement for Document Responder

2:3.68.5 Security Considerations

See MHD Security Considerations.

This transaction should not return information that the Document Consumer is not authorized to access.

2:3.68.5.1 Security Audit Considerations

The security audit criteria are similar to those for the Retrieve Document Set-b [ITI-43] transaction.

2:3.68.5.1.1 Document Consumer Audit

The Document Consumer when grouped with ATNA Secure Node or Secure Application actor shall be able to record a Retrieve Document Consumer Audit Event Log. Audit Example for a Retrieve Document transaction from consumer perspective.

2:3.68.5.1.2 Document Responder Audit

The Document Responder when grouped with ATNA Secure Node or Secure Application actor shall be able to record a Retrieve Document Responder Audit Event Log. Audit Example for a Find Document Lists Transaction from responder perspective.