Integrating the Healthcare Enterprise

IHE IT Infrastructure

Technical Framework Supplement

XDS Metadata Update

Trial Implementation

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Foreword

This is a supplement to the IHE IT Infrastructure Technical Framework 8.0. Each supplement undergoes a process of public comment and trial implementation before being incorporated into the volumes of the Technical Frameworks.

This supplement is submitted for Trial Implementation as of August 19, 2011 and will 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 Technical Framework. Comments are invited and can be submitted at http://www.ihe.net/iti/iticomments.cfm or by email to iti@ihe.net.

This supplement describes changes to the existing technical framework documents and where indicated amends text by addition (**bold underline**) or removal (~~**bold strikethrough**~~), as well as addition of large new sections introduced by editor's instructions to "add new text" or similar, which for readability are not bolded or underlined.

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

Replace Section X.X by the following:

General information about IHE can be found at: www.ihe.net

Information about the IHE IT Infrastructure may be found at: http://www.ihe.net/Domains/index.cfm

Information about the structure of IHE Technical Frameworks and Supplements can be found at: http://www.ihe.net/About/process.cfm and http://www.ihe.net/profiles/index.cfm

The current version of the IHE Technical Framework can be found at: http://www.ihe.net/Technical_Framework/index.cfm

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Introduction

This supplement updates the XDS and XDR profiles to add support for the updating and deleting of metadata.

One new actor and two new transactions are introduced. The Document Administrator actor is the source of the new transactions. The Update Document Set transaction carries metadata updates and the Delete Document Set transaction enables metadata deletion. These new capabilities are assigned to a new actor and new transactions to enable tighter authentication/authorization control over their use.

In XDS, Update Document Set and Delete Document Set are sent to the Document Registry actor and updates are visible through the Registry Stored Query transaction. In XDR, Update Document Set and Delete Document Set are sent to the Document Recipient actor and no query is possible due to the nature of XDR.

Updates use the SubmissionSet object to anchor each submission following the same rules as the Register Document Set transaction. But with update, each metadata object that accompanies the SubmissionSet triggers an update to the registry contents. Updates take the following forms:

- New version of the metadata for a DocumentEntry or Folder object
- Changes in the availabilityStatus attribute of DocumentEntry, Folder, and Association objects
- Addition of Association objects

  Note: This is the first time the availabilityStatus attribute has been used on the Association object.

New attributes logicalID and Version are introduced from ebRIM 3.0 to manage the details of versioning. A new attribute, documentAvailability, is introduced on the DocumentEntry object to allow separate management of the status of a document in a repository. It is now possible to label a document as being Offline. It still exists but cannot be retrieved at the current time.

The Patient ID attribute on DocumentEntry and Folder objects can be updated. This will enable new approaches in the handling of Patient ID Merge/Link.

A key concept for versioning from ebRIM 3.0 is the logicalID or lid (ebRIM name) attribute. The existing id attribute (entryUUID name is used in XDS) is unique for every metadata object in the registry. The new logicalID attribute is also assigned to every metadata object but all objects that are versions of the same logical object share the same value of logicalID. Different versions of a logical object are differentiated by the version attribute that carries the version number: 1,2,3 and so on.

The second key concept for versioning is that Associations point to a specific version of an object. DocumentEntry objects are linked to a Folder object through HasMember Associations showing they are part of the Folder. With the introduction of versioning, this description is updated to show that a version of a DocumentEntry is linked to a version of a Folder through a

HasMember Association. Different versions of a Folder can have different contents. This supplement introduces rules for managing this complexity.

This supplement includes updated documentation on the use of ebRIM Associations in XDS and XDR. The existing documentation is somewhat understated. The update transaction makes heavy use of SubmissionSet Associations (Associations anchored at one end by the SubmissionSet object) to trigger some types of updates.

This supplement was written in parallel with the On-Demand Documents supplement. The two supplements share some common sections and terminology. The On-Demand Documents supplement depends on facilities offered by Metadata Update.

Some discussion and example material regarding the Update Document Set and Delete Document Set transactions are available on the IHE Wiki at: http://wiki.ihe.net/index.php?title=Metadata_Update.

The formal example collection is available at ftp://ftp.ihe.net/TF_Implementation_Material/ITI/examples/MU.

Open Issues and Questions

Closed Issues

Most of the older Closed Issues have been moved to the wiki at: http://wiki.ihe.net/index.php?title=Metadata_Update#Closed_Issues

MV012: *Should the comment attribute on SubmitObjectsRequest/UpdateObjectsRequest be allowed or disallowed? No comment by IHE*

MV015: *There is currently no way to issue a Stored Query asking for only online documents. Add a query parameter to FindDocuments? New query parameter not added*

MV031: *Metadata Update and Delete will both require significant authentication/authorization challenges. Should these be mandated by this profile or left to be decided upon by developers?*

Recommendations made in security sections. No mandates made.

MV033: *Since there is a significant amount of shared content and intertwined concepts should the Metadata Update and Deferred Document and Dynamically Created Content (now the On-Demand Documents) supplements be combined just for ease of understanding by the implementer? Resolution: Content was not combined.*

MV034: *The Document Administrator actor can generate two transactions: Update Document Set and Delete Document Set. Both are optional but a Document Administrator must declare at least one. Is this correct or should the Document Administrator simply be required to support both transactions? Resolution: This is acceptable.*

***MV035**: Should XCA declare options for support of metadata versions in the query response? This could be just a required Gateway feature, especially when working within an XDS Affinity Domain where the capability exists independent of the Gateway. Another alternative might be to expand the option defined in the Deferred Document and dynamically generated content to include the capability of metadata versioning (rather than having two little options as is written now). Could rename the option in the other supplement to be something like "Enhanced support" and lump all this little stuff together under that. Resolution: CP 531, if passed, will enable the capabilities without the need for an option.*

***MV037**: An update of a DocumentEntry or Folder requires that the existing version have a non-Deprecated status. If the existing version is Deprecated, a separate operation must be used to first label it Approved (…) and then a separate operation (in a separate submission) must be used to submit the update since updates cannot be applied to deprecated objects. Should this be made easier? Resolution: restriction has been removed.*

***MV037**: The introduction of metadata versions makes the use of the uniqueID parameter in many Stored Queries awkward since the uniqueID represents all versions of the metadata object. Many Stored Queries, GetFolderAndContents for example, could return multiple versions of the selected Folder and the contents for each of these versions. But, if called with the entryUUID parameter the return semantics do not change. For now I have added footnotes to alert developers.*

***MV038**: Should ITI establish rules for the deletion of metadata? Example is a submission of a DocumentEntry with its attendant SubmissionSet and HasMember association. The minimal deletion of the DocumentEntry must delete the association as well. This leaves a SubmissionSet with no contents. Should the profile require the deletion of the SubmissionSet as well? Obviously more complicated examples exist. Resolution: IHE has not added any restrictions to be base standard. The amount of deletion is not restricted.*

***MV041**: Should Metadata Update apply to XDM? How? Resolution: No*

***MV042:** A public comment made issue of the lack of a defined way to request a deletion from the Document Repository. This has been recorded as Change Proposal 533.*

Volume 1 – Integration Profiles

1.7 History of Annual Changes

Add the following bullet to the end of the bullet list in section 1.7

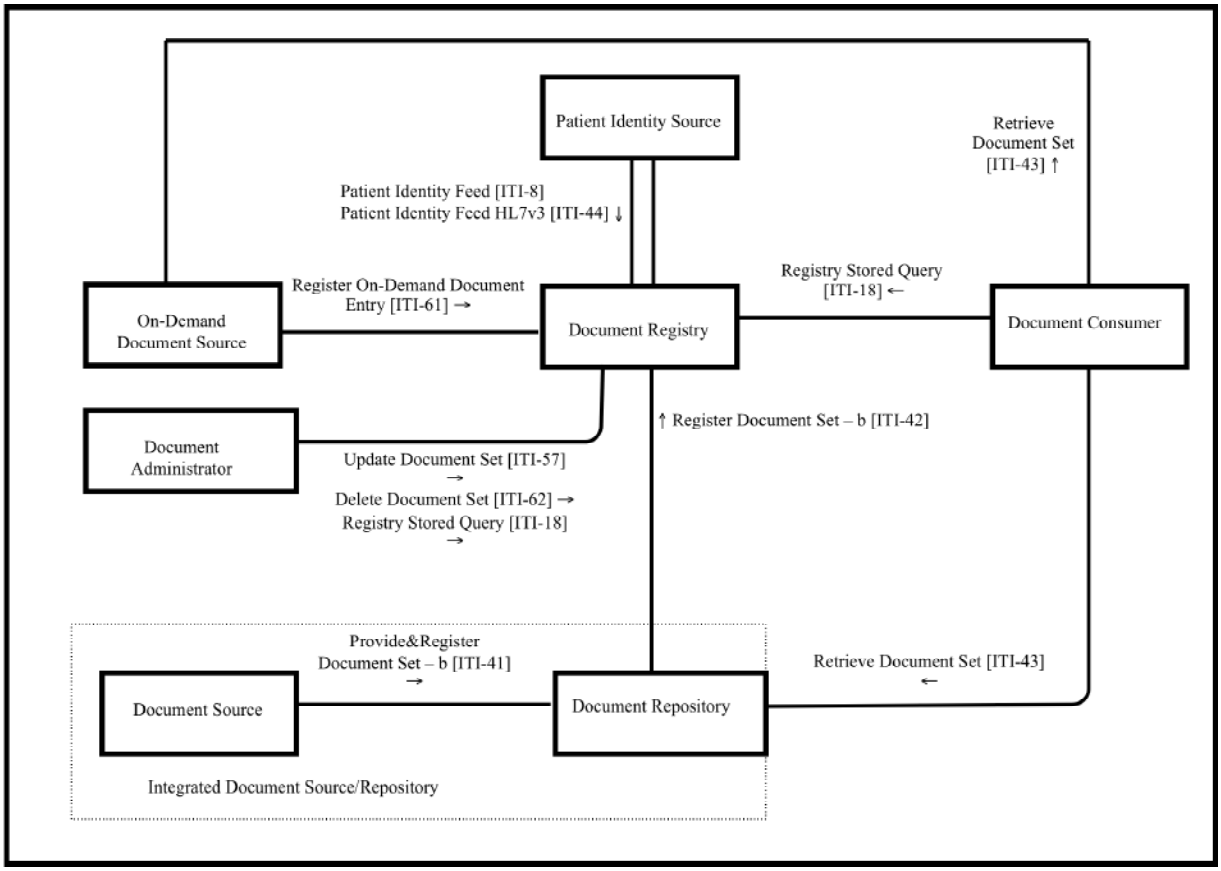
- Update the XDS and XDR profiles to add support for metadata update and deletion.

2.1 Dependencies among Integration Profiles

No new dependencies are introduced with this supplement.

10.1 Actors/ Transactions

Update the following diagram to add the Document Administrator actor and the two new transactions. Note: this version of the diagram includes updates made for the On-Demand Documents supplement since it is difficult to reconcile change tracking inside diagrams. This version of the diagram takes precedence over the one in the On-Demand Documents supplement.



280 **Figure 10.1-1b Cross-Enterprise Document Sharing –b (XDS.b) Diagram**

Update the following table to add the new actor and transaction.

Table 10.1-1b XDS.b - Actors and Transactions

Actors	Transactions	Optionality	Section
Document Consumer	Registry Stored Query [ITI-18]	R	ITI TF-2a: 3.18
	Retrieve Document Set [ITI-43]	R	ITI TF-2b: 3.43
Document Source	Provide and Register Document Set-b [ITI-41]	R	ITI TF-2b: 3.41
Document Repository	Provide and Register Document Set-b [ITI-41]	R	ITI TF-2b: 3.41
	Register Document Set-b [ITI-42]	R	ITI TF-2b: 3.42
	Retrieve Document Set [ITI-43]	R	ITI TF-2b: 3.43
Document Registry	Register Document Set-b [ITI-42]	R	ITI TF-2b: 3.42
	Registry Stored Query [ITI-18]	R	ITI TF-2a: 3.18
	Patient Identity Feed [ITI-8]	O (Note 2)	ITI TF-2a: 3.8
	Patient Identity Feed HL7v3 [ITI-44]	O (Note 2)	ITI TF-2b: 3.44
	Update Document Set [ITI-57]	**O**	**ITI TF-2b: 3.57**

Actors	Transactions	Optionality	Section
	Delete Document Set [ITI-62]	**O**	**ITI TF-2b: 3.62**
Integrated Document Source/Repository	Register Document Set-b [ITI-42]	R	ITI TF-2b: 3.42
	Retrieve Document Set [ITI-43]	R	ITI TF-2b: 3.43
Patient Identity Source	Patient Identity Feed [ITI-8]	O (Note 1,2)	ITI TF-2a: 3.8
	Patient Identity Feed HL7v3 [ITI-44]	O (Note 1,2)	ITI TF-2b :3.44
Document Administrator	**Update Document Set [ITI-57]**	**O (Note 3)**	**ITI TF-2b: 3.57**
	Delete Document Set [ITI-62	**O (Note 3)**	**ITI TF-2b: 3.62**
	Registry Stored Query [ITI-18]	**O**	**ITI-TF-2a: 3.18**

Note 1: If Assigning Authority of Patient ID presents in the Patient Identity Feed or Patient Identity Feed HL7v3 transaction, the Patient Identity Source is required to use an OID to identify the Assigning Authority. For technical details of the assigning authority information, see ITI TF-2a: 3.8.

Note 2: Document Registry and Patient Identify Source shall implement at least one of Patient Identity Feed or Patient Identity Feed HL7v3.

Note 3: Document Administrator shall support at least one of Update Document Set [ITI-57] or Delete Document Set [ITI-62].

Add sections 10.1.1.8 and 10.1.2.9 and 10.1.2.10

10.1.1.8 Document Administrator

The Document Administrator actor supports metadata update by issuing the Update Document Set transaction [ITI-57] and Delete Document Set [ITI-62] transaction to the Document Registry actor.

10.1.2.9 Update Document Set

The Update Document Set transaction is used by the Document Administrator actor to issue metadata updates to the Document Registry actor.

10.1.2.10 Delete Document Set

The Delete Document Set transaction is used by the Document Administrator actor to request metadata deletions from the Document Registry actor.

10.2 XDS Integration Profile Options

Update Table 10.2-1b as follows:

Table 10.2-1b XDS.b - Actors and Options

Actor	Options	Vol & Section
Document Source	Document Replacement	ITI TF-1: 10.2.1
	Document Addendum	ITI TF-1: 10.2.2
	Document Transformation	ITI TF-1: 10.2.3
	Folder Management	ITI TF-1: 10.2.4

Actor	Options	Vol & Section
	Basic Patient Privacy Enforcement	ITI TF-2b:3.41.4.1.3.1
Document Repository	No options defined	
Document Registry (Note 2)	Patient Identity Feed (Note 1)	ITI TF-2a: 3.8
	Patient Identity Feed HL7v3 (Note 1)	ITI TF-2b: 3.44
	Document Metadata Update	**ITI TF-1: 10.2.10**
Integrated Document Source / Repository	Document Replacement	ITI TF-1: 10.2.1
	Document Addendum	ITI TF-1: 10.2.2
	Document Transformation	ITI TF-1: 10.2.3
	Folder Management	ITI TF-1: 10.2.4
	Basic Patient Privacy Enforcement	ITI TF-2b: 3.42.4.1.4.1
Document Consumer	Basic Patient Privacy Enforcement	ITI TF-2a: 3.18.4.1.3.5 ITI TF-2b: 3.43.4.1.3.1
	Basic Patient Privacy Proof	ITI TF-2a: 3.18.4.1.3.6
	Document Metadata Update	**ITI TF-1: 10.2.10**
Patient Identity Source	Patient Identity Feed (Note 1)	ITI TF-2a: 3.8
	Patient Identity Feed HL7v3 (Note 1)	ITI TF-2b: 3.44
Document Administrator	**Update Metadata** **Delete Metadata**	**ITI TF-1: 10.2.11** **ITI TF-1: 10.2.12**

Add section 10.2.10, section 10.2.11 and section 10.2.12

10.2.10 Document Metadata Update Option

A Document Registry actor declares the Document Metadata Update option when it is able to:

1. Accept metadata updates via the Update Document Set [ITI-57] transaction (see ITI TF-2b: 3.57.4.1.3 for details)
2. Expose the metadata updates via the Registry Stored Query [ITI-18] transaction (see ITI TF-2a: 3.18.4.1.2.5.1 for details)
3. Delete metadata via the Delete Document Set [ITI-62] transaction

See section ITI TF-2a: 3.18.4.1.2.3.5.1 for interoperability issues surrounding the Stored Query [ITI-18] transaction.

A Document Consumer actor declares the Document Metadata Update option when it is able to accept and process the additional metadata defined by the option when returned from a Registry Stored Query [ITI-18] transaction (see ITI TF-2a: 3.18.4.1.2.5.1 for details). This includes:

- Multiple versions of DocumentEntry and Folder objects
- LogicalID and version attributes in DocumentEntry and Folder objects

- The DocumentEntry documentAvailability attribute.
- The availabilityStatus attribute on Association objects

See section ITI TF-2a: 3.18.4.1.2.3.5.1 for interoperability issues surrounding the Stored Query [ITI-18] transaction.

10.2.11 Update Metadata Option

A Document Administrator actor declares the Update Metadata Option when it is able to generate the Update Document Set [ITI-57] Transaction. A Document Administrator actor must declare the Update Metadata option or the Delete Metadata option or both.

With this option, a Document Administrator may need to use the Stored Query [ITI-18] transaction to retrieve metadata objects. The retrieved objects are then modified and resubmitted as an update.

10.2.12 Delete Metadata Option

A Document Administrator actor declares the Delete Metadata Option when it is able to generate the Delete Document Set [ITI-62] transaction. A Document Administrator actor must declare the Update Metadata option or the Delete Metadata option or both.

With this option, a Document Administrator may need to use the Stored Query [ITI-18] transaction to retrieve metadata objects. Some reasons for this are to determine entryUUID for an object based on its uniqueID or to discover associations that must be deleted along with a DocumentEntry.

10.3 XDS Process Flow

10.4 General Principles

Remove the stricken text from the next to last paragraph of section 10.4.10.1

An "approved" or "deprecated" XDS Document Entry may be deleted. This change is associated with the decision to completely remove a Document from an XDS Document Repository and the corresponding Document Entry from the XDS Document Registry. The XDS Affinity Domain shall establish the security policies associated with Document deletion. ~~**There are no transactions defined by this Integration Profile to support such operation.**~~

Add section 10.4.14

10.4.14 Metadata Update and Delete

Metadata update is the general ability to perform maintenance on registry metadata by:

- Updating the attributes of a metadata object (DocumentEntry and Folder) by submitting a new version of the entire metadata object.

- Changing the status of objects (e.g., Approved vs. Deprecated) on DocumentEntry, Folder, and Association objects
- Adding new Association objects. The addition of Associations is necessary to repair problems with document relationships (e.g., DocumentEntry is an addendum to the wrong base DocumentEntry) or incorrect Folder membership. In both cases the old Association must be deprecated and a new Association installed.
- When a metadata update changes the Patient ID attribute on DocumentEntry or Folder objects it may lead to a Folder being split, some contents keeping the old Patient ID and some getting a new Patient ID. Since the Patient ID on a Folder must match that of its contents, this may require a new Folder be submitted and some of the contents moved to it. Although this addition of Folder objects may be necessary it must be done through the Register Document Set-b [ITI-42] transaction.

Key use cases include:

- Update patient demographics
- Update confidentiality code
- Deprecate a document without replacing it
- Delete arbitrary registry metadata
- Remove a DocumentEntry from a Folder
- Remove a relationship (addendum, transformation, etc.)
- Update the Patient ID

Deleting metadata from the registry is done with the Delete Document Set transaction. The rest are accomplished with the Update Document Set transaction.

A key issue in managing metadata updates is the creation and removal of the association that:

- Makes a DocumentEntry a member of a Folder
- Documents a relationship between two DocumentEntries (such as Addendum or Transformation)

For example, the updating of a Folder's metadata requires the submission of a new version of the Folder object. The DocumentEntries that are members of the Folder must have their membership propagated from the old version of the Folder object to the new (associations reference a particular version of an object). For each member DocumentEntry, this requires the removal (deprecation) of the association linking it to the old Folder version and the submission of a new association linking it to the new Folder version. For most updates, the rules governing this association propagation are well defined and are best performed within the Document Registry actor. The Document Administrator actor may trigger this with a flag on the update.

An update that changes the Patient ID attribute of a Folder or DocumentEntry is more complicated. The rules for consistency of Patient ID between Folder and member DocumentEntries require that if a DocumentEntry gets a new Patient ID then it must be removed from the Folder (assuming the Folder does not change). The association propagation rules

implemented by the Document Registry actor do not handle this type of update. The Document Administrator must calculate and submit all of the details for changes required.

The Document Administrator signals the Document Registry when it should take responsibility for association propagation through the setting of flags on key objects in the update. These metadata flags are also used to trigger other special operations in the Document Registry actor such the updating of availabilityStatus.

The Delete Document Set transaction requests the deletion of metadata objects from the Document Registry actor. If the transaction is accepted the objects are permanently removed and are no longer returned in the Registry Stored Query [ITI-18] transaction. EbRS, and therefore this profile, offers no provision to un-delete objects or otherwise recover deleted objects.

It is beyond the scope of this profile to instruct architects and developers how to safeguard their systems when using these capabilities. Strong authentication/authorization controls are an important step. The Update Document Set transaction utilizes the SubmissionSet object to document in metadata the time, scope, and source of all updates. Additional information is available through the ATNA prescribed audit logs. The Delete Document Set transaction removes arbitrary metadata objects from the registry so it must be used with extreme caution.

Add this new section ITI TF-1: 10.5.1

10.5.1 Other Actor Grouping Rules

10.5.1.1 Document Administrator grouped with Document Repository

The Document Administrator actor is grouped with the Document Repository actor when it is necessary to modify the online/offline status of a document in the repository. As documents in the repository are removed/restored from network accessible storage, their status can be updated in the Document Registry. The XDSDocumentEntry.documentAvailability is used to label a document as online or offline. Offline indicates that the document still exists but is not currently available for retrieval.

15.1 Actors/ Transactions

Update the actors/transaction diagram in the XDR Supplement

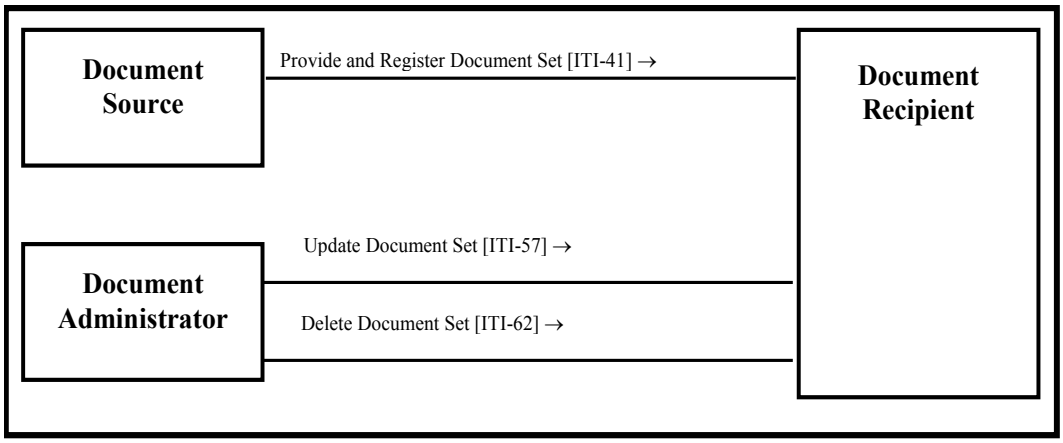


Figure 15.1-1 XDR Actor Diagram

Update the following table to add the new actors and transactions.

Table 15.1-1 XDR Integration Profile - Actors and Transactions

Actors	Transactions	Optionality	Section in Vol. 2
Document Source	Provide and Register Document Set-b [ITI-41]	R	ITI TF-2:3.41
Document Recipient	Provide and Register Document Set –b [ITI-41]	R	ITI TF-2:3.41
	Update Document Set [ITI-57]	**O**	**ITI TF-2b: 3.57**
	Delete Document Set [ITI-62]	**O**	**ITI TF-2b: 3.62**
Document Administrator	**Update Document Set [ITI-57]**	**O[1]**	**ITI TF-2b: 3.57**
	Delete Document Set [ITI-62]	**O[1]**	**ITI TF-2b: 3.62**

Note 1: Document Administrator shall support at least one of Update Document Set [ITI-57] or Delete Document Set [ITI-62].

Update the XDR Actors and Options table as follows.

Table 15.2-1 XDR - Actors and Options

Actor	Options	Vol & Section
Document Source	*Multiple Document Submission*	ITI TF-1: 15.2.1
	Basic Patient Privacy Enforcement	ITI-TF-2b: 3.41.4.1.3.1
Document Recipient	*Basic Patient Privacy Enforcement*	ITI-TF-2b: 3.41.4.1.3.1
	Document Metadata Update	**ITI TF-1: 15.2.4**
Document Administrator	***Update Metadata***	**ITI TF-1: 15.2.5**
	Delete Metadata	**ITI TF-1: 15.2.6**

Add sections 15.2.4, 15.2.5, 15.2.6, 15.6 to XDR Supplement

15.2.4 Document Metadata Update Option

A Document Recipient actor declares the Document Metadata Update option when it is able to accept both the Update Document Set [ITI-57] transaction (see ITI TF-2b: 3.57.4.1.3 for details) and Delete Document Set [ITI-62] transaction.

15.2.5 Update Metadata Option

A Document Administrator actor declares the Update Metadata Option when it is able to generate the Update Document Set [ITI-57] transaction. A Document Administrator actor must declare the Update Metadata option or the Delete Metadata option or both.

15.2.6 Delete Metadata Options

A Document Administrator actor declares the Delete Metadata Option when it is able to generate the Delete Document Set [ITI-62] transaction. A Document Administrator actor must declare the Update Metadata option or the Delete Metadata option or both.

15.6 Metadata Update and Delete

The Document Metadata Update option documents the use of the Update Document Set [ITI-57] transaction and Delete Document Set [ITI-62] transaction when communicating with a Document Recipient actor. Section ITI TF-1: 10.4.14 documents general principles of these transactions that also apply to their use in XDR. An important difference is the lack of a query transaction between a Document Source and a Document Recipient. To enable the future use of update and delete, the Document Source will have to maintain information about the transmissions to permit the proper coding of future updates and deletes. To use these transactions the Document Source shall:

- Assign UUID format values to all entryUUID attributes transmitted in a Provide and Register-b [ITI-41] transaction
- Retain these entryUUID values for use in updates and deletes
- Retain version numbers for all transmitted versioned objects so the proper version information can be inserted in updates. Version numbers are never assigned as part of a metadata submission, but updates are required to include the version of the object being updated.
- In general retain knowledge of the metadata sent so that proper updates can be generated.

Volume 2b – Transactions

Add section 3.57

3.57 Update Document Set

Many sections of this document make reference to terms introduced by the On-Demand Documents Supplement which is undergoing parallel development. Specifically, the following terms come from that document and readers are directed there for further reading:

On-Demand (new type of DocumentEntry with new objectType attribute value)

Stable (new, more specific name, for what has previously been just DocumentEntry)

This section corresponds to Transaction 57 of the IHE Technical Framework. Transaction 57 is used by the Document Administrator, Document Registry and Document Recipient actors.

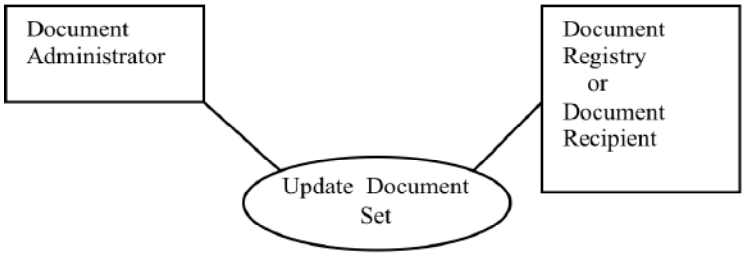
3.57.1 Scope

The Update Document Set transaction passes a collection of metadata updates from the Document Administrator actor to the Document Registry or Document Recipient actor. The update contains:

- A SubmissionSet object that organizes the content of the update
- Zero or more updated DocumentEntry objects
- Zero or more updated Folder objects
- Zero or more other Associations that trigger other updates

Key objects in the submission are attached to the SubmissionSet object via HasMember Associations.

3.57.2 Use Case Roles



Actor: Document Administrator

Role: Issues metadata updates

Actor: Document Registry or Document Recipient

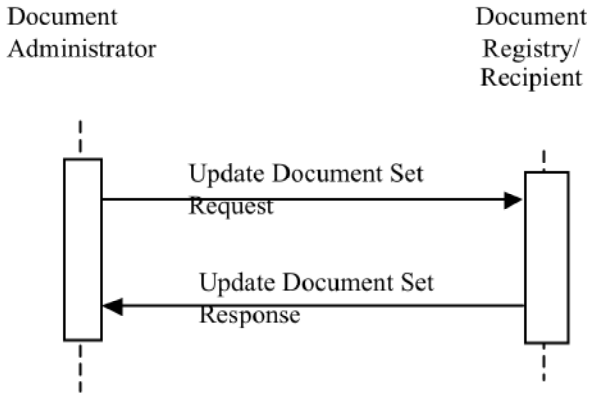
Role: Accepts metadata updates

3.57.3 Referenced Standard

Implementers of this transaction shall comply with all requirements described in ITI TF-2x: Appendix V: Web Services for IHE Transactions.

ebRIM	OASIS/ebXML Registry Information Model v3.0
ebRS	OASIS/ebXML Registry Services Specifications v3.0
Appendix V	ITI TF-2x:Appendix V Web Services for IHE Transactions Contains references to all Web Services standards and requirements of use

3.57.4 Interaction Diagram



3.57.4.1 Update Document Set Request

An Update Document Set Request message provides the ability to submit the following types of updates to registry metadata:

- Updated attributes for a DocumentEntry
- Updated attributes for a Folder
- Change availabilityStatus of DocumentEntry, Folder, or Association objects
- Submit new Association objects

3.57.4.1.1 Trigger Events

A Document Administrator needs to update the metadata attributes of existing registry objects or the Association-based linkage between them. The specific triggers for the different types of metadata updates are documented in these sections:

- 3.57.4.1.3.3.1 – Update DocumentEntry Metadata

- 3.57.4.1.3.3.2 – Update DocumentEntry availabilityStatus
- 3.57.4.1.3.3.3 – Update Folder Metadata
- 3.57.4.1.3.3.4 – Update Folder availabilityStatus
- 3.57.4.1.3.3.5 – Update Association availabilityStatus
- 3.57.4.1.3.3.6 – Submit Associations

3.57.4.1.2 Message Semantics

An Update Document Set Request message is an ebRS SubmitObjectsRequest containing ebRIM formatted metadata. The ebRIM attributes lid (logicalID in XDS) and versionName (version in XDS) are used to manage versions. See ITI TF-3: 4.1.15 for Metadata Versioning Semantics. Metadata updates are submitted as contents of a SubmissionSet.

3.57.4.1.2.1 Message Definition

An example Update Document Set Request message looks like:

```
<lcm:SubmitObjectsRequest>
    <rim:RegistryObjectList>
        <!-- Required SubmissionSet object -->
        <rim:RegistryPackage id="SubmissionSet"/>

        <rim:Association sourceObject="SubmissionSet"
                         targetObject="..."
                         associationType="xxx"/>
        <rim:Association sourceObject="SubmissionSet"
                         targetObject="..."
                         associationType="xxx"/>
    </rim:RegistryObjectList>
</lcm:SubmitObjectsRequest>
```

Note:

- The contents of the SubmissionSet object and many details of the Association objects are not shown
- Each update contained in the message includes an association linked to the SubmissionSet object
- If the targetObject attribute of the association references an object already in the registry then the associationType and contained metadata (e.g., Slots nested inside the association) control the update
- If the targetObject attribute of the association references an object contained in the update, that object also helps control the update

Section ITI TF-3: 4.1.15 documents the semantics of metadata update.

3.57.4.1.3 Expected Actions

The Document Registry or Document Recipient actor parses the metadata supplied in the Update Document Set Request message and makes the updates triggered by the metadata objects in the message. In general, each metadata object supplied triggers a separate metadata update. The expected actions are documented in the sub-sections below as a collection of discrete operations each triggered by a single metadata object in the message and constrained by metadata attributes contained in the message and in related objects in the registry/recipient system.

The receiving actor shall be able to manage the following attributes on DocumentEntry, Folder, and Association objects:

- logicalID
- version
- availabilityStatus

which require special handling dictated by metadata update. The receiving actor shall be capable of storing multiple versions of DocumentEntry and Folder metadata objects. If the receiving actor is a Document Registry then it shall make them available through the Registry Stored Query [ITI-18] transaction.

When interpreting the rules below, section ITI TF-3: 4.1.15 shall be consulted for an understanding of the semantics of metadata update.

3.57.4.1.3.1 Common Rules for Metadata Update

These common rules shall apply to all metadata update operations. They describe overall Document Registry and Document Recipient behavior with regard to metadata update. The documentation for the individual metadata update operations, found in the following sections, specialize and extend these common rules.

1. An Update Document Set request shall include a SubmissionSet object.
2. An Update Document Set request shall not include initial versions of DocumentEntry or Folder objects. In a request, initial versions are recognized by having entryUUID = logicalID or logicalID missing.
3. The only way to update the metadata attributes of a DocumentEntry or Folder is by submitting a new version of the DocumentEntry or Folder. A special/different rule applies to the updating of the availabilityStatus attribute of a DocumentEntry or Folder.
4. An updated version of a DocumentEntry object, when included in an Update Document Set request, shall be a complete DocumentEntry object. Individual attributes cannot be submitted alone.
5. An updated version of a Folder object, when included in an Update Document Set request, shall be a complete Folder object. Individual attributes cannot be submitted alone.

6. Association objects cannot be updated by submitting a new version. The only attribute that can be updated is availabilityStatus. A value of Deprecated represents a historical connection between two objects that is no longer current.
7. The availabilityStatus attribute on DocumentEntry, Folder, and Association objects is controlled by the Document Registry or Document Recipient actor and cannot be altered through direct submission. A mechanism is included for requesting the registry change the value of this attribute.
8. The availabilityStatus of SubmissionSet Associations (sourceObject attribute references a SubmissionSet object) cannot be changed.
9. All metadata objects in an Update Document Set Request message shall have an entryUUID (id) attribute. It may be coded as a UUID or symbolic name. This attribute shall be used by the receiving actor when reporting errors.
10. The submission of metadata objects: DocumentEntries, Folders, Associations; in the support of metadata versioning follows the same rules as defined for the Register Document Set-b [ITI-42] transaction or Provide and Register Document Set-b [ITI-41] transaction. These rules are defined in ITI TF-3: 4.1.
11. A single Update Document Set transaction may contain both an Update DocumentEntry Metadata operation and an Update DocumentEntry Status operation targeting the same logical DocumentEntry. When this occurs, the Document Registry or Document Recipient shall create the new DocumentEntry version and then apply the new availablityStatus value to this new version. The previous version, the one present before the processing of this transaction began, shall not be modified.
12. A single Update Document Set transaction may contain both an Update Folder Metadata operation and an Update Folder Status operation targeting the same logical Folder. When this occurs, the Document Registry or Document Recipient shall create the new Folder version and apply the new availablityStatus value to this new version.
13. A single Update Document Set transaction shall not contain multiple Update (DocumentEntry or Folder) Metadata operations targeting the same logical object.
14. A single Update Document Set transaction shall not contain multiple Update (DocumentEntry or Folder or Association) Status operations targeting the same logical object.
15. At any point in time there shall be at most one version of a logical DocumentEntry object with status Approved in the registry/recipient. If this version exists it shall always be the most recent version.
16. At any point in time there shall be at most one version of a logical Folder object with status Approved in the registry/recipient. If this version exists it shall always be the most recent version.
17. The traditional database property of atomicity shall apply to the processing of an Update Document Set Request message. All of the component operations of an Update

Document Set Request message are successfully completed or no changes are made to the Document Registry/ Document Recipient actor.

3.57.4.1.3.1.1 Rules for Update Planning

The general rules found in the previous section and the rules documenting each individual update type below are adequate for describing the individual update operations in isolation. When related updates are specified in an Update Document Set Request a planning phase is required in the implementation of the Document Registry or Document Recipient.

Related updates refers to two or more update operations that operate on overlapping registry objects. For example, updating the metadata of a DocumentEntry that is related to second DocumentEntry through an APND association is a well-defined operation: install the new version of the DocumentEntry, deprecate the old version, and install a new APND association between the new version and the related DocumentEntry. This description assumes Association Propagation is enabled on the operation.

But, what if the update request also instructed the receiver to update the metadata of the appended DocumentEntry? (Update both DocumentEntry objects bound together by the APND association) The proper response from the receiver is to:

- Install updated version of the first DocumentEntry
- Install updated version of the second DocumentEntry
- Create new APND association between the new first DocumentEntry and the new second DocumentEntry. This assumes Association Propagation is requested for these updates (define below).

If the two updates of the DocumentEntries were handled independently then it is possible that:

- An APND association is created between the new first DocumentEntry and old second DocumentEntry because the receiver started by focusing on the update to the first DocumentEntry, then
- An APND association is created between the old first DocumentEntry and the new second DocumentEntry because the receiver moved its focus to the second DocumentEntry update request and didn't notice what it did in the previous step was related.
- The result is the creation of two new associations and neither of them is correct. The correct outcome is an APND association between the two new DocumentEntry versions.

This scenario assumes that Association Propagation was enabled for both DocumentEntry updates.

The result is that the Document Registry or Document Recipient actor that is implementing Association Propagation or the Document Administrator that is formulating the update request not using Association Propagation shall:

- Recognize that two or more DocumentEntries being updated are related through associations
- Recognize that a Folder and a DocumentEntry being updated are related (DocumentEntry is member of Folder)

- Install of updates to these related objects by:
  - First installing updated versions of the objects
  - Second performing Association Propagation to interconnect the affected objects
- Reject update requests where two related updates have different values for AssociationPropagation (see ITI TF-3: 4.1.6.4.4.7 for details)

3.57.4.1.3.2 Error Reporting

Any errors occurring in the processing of an Update Document Set Request shall cause the entire transaction to fail, returning the errors detected, and causing no updates to the Document Registry. It shall be handled as a transaction, all operations succeed or no updates are made.

3.57.4.1.3.3 Metadata Operations

This section defines the metadata update operations permitted. Each operation is documented separately. Multiple metadata operations shall be accepted in a single Update Document Set Request. When the Document Registry/Recipient actor receives a submission and cannot decode the operation following the rules stated below, it shall return the error code XDSMetadataUpdateOperationError.

The technical operations that can be performed on metadata are summarized as:

- Update DocumentEntry Metadata (Stable or On-Demand) in 3.57.4.1.3.3.1
- Update DocumentEntry Status in 3.57.4.1.3.3.2
- Update Folder Metadata in 3.57.4.1.3.3.3
- Update Folder Status in 3.57.4.1.3.3.4
- Update Association Status in 3.57.4.1.3.3.5
- Submit new Association object(s) in 3.57.4.1.3.3.6

Each operation is described with the following sub-sections:

Semantics - meaning of the operation

Trigger - each metadata object in the submission, excluding the SubmissionSet object and the SubmissionSet HasMember Associations, triggers a single operation. The trigger section of each operation tells how to recognize its trigger metadata object. When a metadata object triggers multiple operations, the preconditions section of the operation shall be used to resolve the conflict. If multiple or no operations are selected after considering the trigger and preconditions then the XDSMetadataUpdateOperationError shall be returned.

Preconditions - required state of objects already in the Document Registry/Recipient that are necessary to process the operation.

Actions - the actions taken by the Document Registry/Recipient actor if the Trigger and Preconditions are met.

Association Propagation - the submission of certain types of Associations causes the registry/recipient to generate other, secondary, Associations to complete the semantic requirements of the operation.

AvailabilityStatus Changes - side effects of the operation that change the availabilityStatus attribute on objects. This does not include the normal setting of availabilityStatus to Approved for newly submitted objects. Changing the availabilityStatus on an object does not require the creation of a new version.

Patient ID Mgmt -Special handling required of the Patient ID attribute of DocumentEntry and Folder objects.

3.57.4.1.3.3.1 Update DocumentEntry Metadata

3.57.4.1.3.3.1.1 Semantics

Update the metadata of a DocumentEntry object by submitting a new version of the DocumentEntry object and making this new version the current (availabilityStatus of Approved) version and deprecating the previous version.

3.57.4.1.3.3.1.2 Trigger

The following rules shall be used by the receiving actor to detect an Update DocumentEntry Metadata operation in a submission:

- Submission contains a DocumentEntry object
  1. The logicalID attribute is present in the DocumentEntry object and has a UUID formatted value.
  2. The SubmissionSet to DocumentEntry HasMember Association has a Slot with name PreviousVersion. This Slot has a single value, the version number of the previous version, the one being replaced.

3.57.4.1.3.3.1.3 Preconditions

The following rules shall be used by the receiving actor to decode and validate a submission:

1. Document Registry/Recipient contains an existing DocumentEntry (Stable or On-Demand) instance with status of Approved.
2. Submitted DocumentEntry and existing DocumentEntry have the same values for the logicalID, uniqueID, and objectType attributes.
3. The value of the PreviousVersion Slot matches the version number of the existing DocumentEntry. If all other rules succeed and this one fails, return the error code XDSMetadataVersionError.
4. The Document Registry/Recipient shall verify that the new DocumentEntry is valid.

3.57.4.1.3.3.1.4 Actions

Store the new DocumentEntry. The version attribute is set to PreviousVersion plus one. The availabilityStatus attribute is set to the value found in the existing DocumentEntry.

3.57.4.1.3.3.1.5 Association Propagation

Association Propagation is controlled by the AssociationPropagation slot on the SubmissionSet HasMember Association referencing the DocumentEntry object that triggered this operation. The following rules apply if this slot is missing or if its value is 'yes'. If the value is 'no' then the Document Administrator actor takes full responsibility for linking the updated DocumentEntry object to existing metadata.

The receiving actor scans for non-deprecated HasMember Associations linking the existing DocumentEntry to a Folder. When found, a new HasMember Association is generated linking the included DocumentEntry to the same Folder.

The receiving actor scans for non-deprecated relationship associations (see section ITI TF:3 4.1.6.4.1) linked to the existing DocumentEntry. When found, these associations are replicated referencing the submitted DocumentEntry instead of the existing DocumentEntry. This causes the submitted DocumentEntry to inherit all the relationships from the existing DocumentEntry.

See section ITI TF-2b: 3.57.4.1.3.1.1 for additional information on Association Propagation.

3.57.4.1.3.3.1.6 AvailabilityStatus Changes

AvailabilityStatus of the existing DocumentEntry is changed to Deprecated.

3.57.4.1.3.3.1.7 Patient ID Management

If the PatientID attribute of the existing and submitted DocumentEntries is different than the rules in section ITI TF-2b: 3.57.4.1.3.4 shall be applied. If PatientID Reconciliation fails then the entire Update Document Set transaction shall fail. The receiving actor shall make no updates and shall return the XDSPatientIDReconciliationError error code.

3.57.4.1.3.3.2 Update DocumentEntry AvailabilityStatus

3.57.4.1.3.3.2.1 Semantics

Update the availabilityStatus attribute of a DocumentEntry object by submitting an UpdateAvailabilityStatus Association anchored by the SubmissionSet.

3.57.4.1.3.3.2.2 Trigger

The following rules shall be used by the receiving actor to detect an Update DocumentEntry Status operation in a submission:

- Submission contains an UpdateAvailabilityStatus Association:

1. The Association sourceObject references the SubmissionSet object. The targetObject is in UUID format.
2. The Association contains a Slot with name of OriginalStatus containing a single value, the current namespace qualified availabilityStatus of the DocumentEntry referenced by the targetObject attribute. This Slot helps prevent race conditions when multiple Document Administrator actors are present.
3. The Association contains a Slot with name NewStatus containing a single value, the namespace qualified availabilityStatus value to be assigned to the DocumentEntry referenced by the targetObject attribute.
4. The value of NewStatus is a valid status for a DocumentEntry.

3.57.4.1.3.3.2.3 Preconditions

The following rules shall be used by the receiving actor to decode and validate a submission:

1. The Association's targetObject attribute references an existing DocumentEntry in the registry (Stable or On-Demand).
2. The DocumentEntry availabilityStatus attribute matches the value of OriginalStatus.
3. The existing DocumentEntry is the most recent instance (highest version number) for this logical DocumentEntry in the registry.

3.57.4.1.3.3.2.4 Actions

None

3.57.4.1.3.3.2.5 Association Propagation

None

3.57.4.1.3.3.2.6 AvailabilityStatus Changes

Change the availabilityStatus attribute on the existing DocumentEntry to the value found in NewStatus.

3.57.4.1.3.3.2.7 Patient ID Management

If this operation changes the status of the DocumentEntry from Deprecated to Approved then PatientID Reconciliation Rules shall apply. See section ITI TF-2b: 3.57.4.1.3.4. If PatientID Reconciliation fails then the entire Update Document Set transaction shall fail. The receiving actor shall make no updates and shall return the XDSPatientIDReconciliationError error code.

3.57.4.1.3.3.3 Update Folder Metadata

3.57.4.1.3.3.3.1 Semantics

Update the metadata of a Folder object by submitting a new version of the Folder object and making this new version the current (Approved) version and deprecating the previous version. At any point in time there shall be at most one version of a logical Folder object with status Approved. If this version exists it shall always be the most recent version.

3.57.4.1.3.3.3.2 Trigger

The following rules shall be used by the receiving actor to detect an Update Folder Metadata operation in a submission:

- Submission contains a Folder object
  1. This is the updated form of a Folder (entryUUID and logicalID attributes both present and have different values).
  2. The Folder logicalID attribute has a UUID formatted value. This links the update instance to the logical Folder already in the registry.
  3. The SubmissionSet to Folder HasMember Association has a Slot with name PreviousVersion. This Slot has a single value, the version number of the previous version, the one being replaced. This is used by the registry to detect update conflicts.

3.57.4.1.3.3.3.3 Preconditions

The following rules shall be used by the receiving actor to decode and validate a submission:

1. Recipient contains an existing Folder instance with status of Approved.
2. Submitted Folder and existing Folder have the same values for the logicalID and uniqueID attributes.
3. The value of the PreviousVersion Slot matches the version number of the existing Folder. If all other rules succeed and this one fails, return the error code XDSMetadataVersionError.

3.57.4.1.3.3.3.4 Actions

Store the new Folder. The version attribute is set to PreviousVersion plus one. The availabilityStatus attribute is set to the value found in the existing Folder.

3.57.4.1.3.3.3.5 Association Propagation

Association Propagation is controlled by the AssociationPropagation slot on the SubmissionSet HasMember Association referencing the Folder object that triggered this operation. The following rules apply if this slot is missing or if its value is ‘yes’. If the value is ‘no’ then the

Document Administrator actor takes full responsibility for linking the updated Folder object to existing metadata.

The receiving actor scans for non-deprecated HasMember Associations linking the existing Folder to a DocumentEntry with status Approved. When found, a new HasMember Association is generated linking the included Folder to the DocumentEntry.

See section ITI TF-2b: 3.57.4.1.3.1.1 for additional information on Association Propagation.

3.57.4.1.3.3.3.6 AvailabilityStatus Changes

AvailabilityStatus of the existing Folder is changed to Deprecated.

3.57.4.1.3.3.3.7 Patient ID Management

If the PatientID attributes of the existing and submitted Folders are different then the rules in section ITI TF:2b 3.57.4.1.3.4 shall be applied. If PatientID Reconciliation fails then the entire Update Document Set transaction shall fail. The receiving actor shall make no updates and shall return the XDSPatientIDReconciliationError error code.

3.57.4.1.3.3.4 Update Folder AvailabilityStatus

3.57.4.1.3.3.4.1 Semantics

Update the status attribute of a Folder object by submitting an UpdateAvailabilityStatus Association anchored by the SubmissionSet.

3.57.4.1.3.3.4.2 Trigger

The following rules shall be used by the receiving actor to detect an Update Folder Status operation in a submission:

- Submission contains a UpdateAvailabilityStatus Association:
  1. The Association sourceObject references the SubmissionSet object. The targetObject is in UUID format.
  2. The Association contains a Slot with name of OriginalStatus containing a single value, the current namespace qualified availabilityStatus of the Folder to be updated. This Slot helps prevent race conditions when multiple Document Administrator actors are present.
  3. The Association contains a Slot with name NewStatus containing a single value, the namespace qualified availabilityStatus to be assigned to the Folder.
  4. The value of NewStatus is a valid status for a Folder.

3.57.4.1.3.3.4.3 Preconditions

The following rules shall be used by the Document Registry/Recipient actor to decode and validate a submission:

1. The UpdateAvailabilityStatus Association's targetObject attribute references an existing Folder in the registry with availabilityStatus matching the value of OriginalStatus.
2. The existing Folder is the most recent instance (highest version number) for this logical Folder in the registry.
3. The value of the OriginalStatus Slot matches the availabiliyStatus attribute of the existing Folder.

3.57.4.1.3.3.4.4 Actions

None

3.57.4.1.3.3.4.5 Association Propagation

None

3.57.4.1.3.3.4.6 AvailabilityStatus Changes

Change the availabilityStatus attribute on the existing Folder to the value found in NewStatus.

3.57.4.1.3.3.4.7 Patient ID Management

If this operation changes the availabiliyStatus of the Folder from Deprecated to Approved then PatientID Reconciliation Rules shall apply. See section ITI TF:2a 3.57.4.1.3.4. If PatientID Reconciliation fails then the entire Update Document Set transaction shall fail. The receiving actor shall make no updates and shall return the XDSPatientIDReconciliationError error code.

3.57.4.1.3.3.5 Update Association AvailabilityStatus

3.57.4.1.3.3.5.1 Semantics

Update the availabilityStatus attribute of an Association object by submitting an UpdateAvailabilityStatus Association anchored by the SubmissionSet. This can be used to Deprecate and Undeprecate a Folder membership Association or relationship Association.

3.57.4.1.3.3.5.2 Trigger

The following rules shall be used by the receiving actor to detect an Update Association AvailabilityStatus operation in a submission:

- Submission contains an UpdateAvailabilityStatus Association.

1. The Association sourceObject references the SubmissionSet object. The targetObject is in UUID format.
2. The Association contains a Slot with name of OriginalStatus containing a single value, the current namespace qualified availabilityStatus of the Association to be updated. This Slot helps prevent race conditions when multiple Document Administrator actors are present.
3. The Association contains a Slot with name NewStatus containing a single value, the namespace qualified availabilityStatus to be assigned to the Association.

3.57.4.1.3.3.5.3 Preconditions

The following rules shall be used by the receiving actor to decode and validate a submission:

1. The UpdateAvailabilityStatus Association's targetObject attribute references an existing Association in the registry.
2. One of these two conditions shall be true:
   - The existing Association has type HasMember and the sourceObject attribute points to a Folder
   - The existing Association is a relationship type Association
3. The availabilityStatus attribute of the existing Association matches the value of OriginalStatus. If the existing Association has no availabilityStatus attribute then the default value of urn:oasis:names:tc:ebxml-regrep:StatusType:Approved is assumed.

3.57.4.1.3.3.5.4 Actions

None

3.57.4.1.3.3.5.5 Association Propagation

None

3.57.4.1.3.3.5.6 AvailabilityStatus Changes

Change the availabilityStatus attribute on the existing Association to the value found in NewStatus.

3.57.4.1.3.3.5.7 Patient ID Management

If this operation changes the availabilityStatus of the Association from Deprecated to Approved then PatientID Reconciliation Rules shall apply. See section ITI TF-2b: 3.57.4.1.3.4. If PatientID Reconciliation fails then the entire Update Document Set transaction shall fail. The receiving actor shall make no updates and shall return the XDSPatientIDReconciliationError error code.

3.57.4.1.3.3.6 Submit Associations

3.57.4.1.3.3.6.1 Semantics

It is sometimes necessary to submit arbitrary associations to repair an existing patient record. This occurs because:

- The Document Administrator does not request Association Propagation but instead includes all the necessary associations to complete the update
- The update includes changing the Patient ID on one or more objects so new associations are necessary and Association Propagation is not usable

This operation allows for that submission.

3.57.4.1.3.3.6.2 Trigger

The following rules shall be used by the receiving actor to detect a Submit Associations operation in a submission:

- Submission contains a SubmitAssociation Association.
    1. The Association sourceObject references the SubmissionSet object.
    2. The targetObject references a new association object in the submission

3.57.4.1.3.3.6.3 Preconditions

The following rules shall be used by the receiving actor to decode and validate a submission:

1. The sourceObject and targetObject attributes of the new association reference objects already in the recipient system (implies UUID format).
2. The sourceObject and targetObject shall not be deprecated.
3. The sourceObject and targetObject shall not reference a SubmissionSet object.

3.57.4.1.3.3.6.4 Actions

Save new association.

3.57.4.1.3.3.6.5 Association Propagation

None

3.57.4.1.3.3.6.6 Status Changes

None

3.57.4.1.3.3.6.7 Patient ID Management

Patient ID Reconciliation rules shall be applied. If PatientID Reconciliation fails then the entire Update Document Set transaction shall fail. The receiving actor shall make no updates and shall return the XDSPatientIDReconciliationError error code.

3.57.4.1.3.4 Patient ID Reconciliation

The Update Document Set transaction can be used to update the Patient ID attribute of DocumentEntry and Folder objects in the receiving actor. This section documents the rules that shall be followed when updating the Patient ID attribute.

The following is a re-statement of the rules governing Patient IDs in metadata, including the use of versioning:

1. All SubmissionSet, Folder, and DocumentEntry objects linked by Associations shall carry the same Patient ID.
2. The only exception is linking a DocumentEntry to a Submission 'by reference' as documented in section ITI TF-3: 4.1.4.1.

These rules are not relaxed to accommodate Metadata Update. They are however extended to cover consistency between versions of a metadata object:

3. Two versions of a metadata object: DocumentEntry or Folder, are not required to carry the same Patient ID.

Rule #1 above is refined:

4. All SubmissionSet, approved Folder, and approved DocumentEntry objects linked by approved Associations shall carry the same Patient ID. No Patient ID consistency is expected across associations with availabiltyStatus of Deprecated or when one of the sourceObject or targetObject referenced objects has availabilityStatus of Deprecated.
5. The Update Objects Request transaction is an atomic operation:
   - At the end of the transaction the above Patient ID rules shall be enforced.
   - During the processing of any single element of the update, metadata will exist in the registry that does not follow the Patient ID rules.
   - If any part of the transaction fails, it shall leave the registry in the state it was at the beginning of the transaction.

Automatic association propagation, as defined in each metadata update operation section, is the receiver (Document Registry or Document Recipient) taking responsibility for deprecating old and generating new associations necessary for maintaining relationships in metadata with the addition of new object versions. These rules are adequate as long as the Patient ID is not updated. When the Patient ID is being updated one of two scenarios is likely:

- The Patient ID is wrong and all metadata for this Patient ID is to be updated

- A record is being split, some records keeping the original Patient ID and some getting the new one.

In either case, association propagation is not the right approach. Instead a two-step process is necessary:

1. Updates made to all (or some) related DocumentEntry and Folder objects changing the Patient ID.
2. Associations submitted to re-link all (or some) of the new DocumentEntry and Folder versions.

When all objects for a Patient ID are affected, all of the involved DocumentEntry and Folder objects are updated with the new Patient ID. New associations are then installed to link the new versions into the same relationships. The old DocumentEntry and Folder objects are deprecated.

If the patient record is being split (only some of the objects get a new Patient ID) the same basic rules apply (but to only some of the objects) and there is also the possibility of document relationships and folder memberships being split and recombined to sort out the correct Patient ID assignment. The following operations are required and human supervision is likely necessary:

- Assign DocumentEntry a new Patient ID by submitting a new version of the DocumentEntry
- Deprecate relationship association between two DocumentEntries that will have different Patient IDs. See Rule # 4 in 3.57.4.1.3.4..
- Install new relationship association. This may or may not be possible based on the documents available. Example: an original document and its replacement end up with different Patient IDs.
- Assign Folder a new Patient ID by submitting a new version.
- Create a new Folder with a new Patient ID to hold part of existing Folder contents that get a new Patient ID
- Remove DocumentEntries from a Folder by deprecating the HasMember association
- Add them to a new Folder by installing a new HasMember association

3.57.4.1.3.4.1 Unconnected DocumentEntry Example

Updating the Patient ID on a DocumentEntry with no relationships or Folder memberships is a simple case. A new version of the DocumentEntry with the new Patient ID is submitted. The update causes the prior version to be deprecated by the receiving actor. The SubmissionSet to DocumentEntry association (original DocumentEntry) does not require deprecation because of rule #4 above.

3.57.4.1.3.4.2 Simple Relationship Example

Updating the Patient ID on a DocumentEntry that is an amendment for another DocumentEntry. No other relationships or Folder memberships exist. Both the original DocumentEntry and the amendment are assigned the new Patient ID. The update must include an updated version of the

original DocumentEntry and the amendment DocumentEntry (with new Patient ID) and a new amend association (APND) linking the new versions. Since the receiving actor automatically deprecates both prior versions, the original APND association can be deprecated but it is not necessary. See rule #4 in 3.57.4.1.3.4.

3.57.4.1.3.4.3 Relationship Example with Split Patient ID

Updating the Patient ID on a DocumentEntry that has an APND relationship with another DocumentEntry but this other DocumentEntry is to retain the original Patient ID. Since the APND relationship is illegal if the Patient IDs are different, this requires one of the following approaches to avoiding Patient ID misalignments:

- Deprecate the APND association and update the original DocumentEntry with a new Patient ID. The amendment DocumentEntry loses its status as an amendment but continues to exist as a document. In this case the update includes a new version of the original DocumentEntry coded with the new Patient ID and a deprecate request for the APND association.
- The amendment is not useful without the linkage to the original document. It is deprecated. The APND association does not require deprecation. See rule #4 in 3.57.4.1.3.4 . In this case the update includes a new original DocumentEntry coded with the new Patient ID and a deprecate request for the amended DocumentEntry.

3.57.4.1.4 Security Considerations

Relevant XDS Affinity Domain security considerations are discussed in the XDS Security Considerations Section (see ITI TF-1: 10.7).

Metadata updates are restricted to being carried only by the Update Document Set [ITI-57] transaction initiated only by the Document Administrator actor because the updating of a patient record involves more and different risk as compared to the submission of new elements of the patient record. We chose an independent transaction so that access controls can be isolated. Policy can then leverage the ATNA authentication to authorize updates to the patient record using the Provide and Register Document Set transaction from one node and forbid the Update Document Entry transaction from the same node.

This transaction will likely require its actors be grouped with actors in the XUA profile by policy in most environments.

Some pertinent risks are:

- Changing the confidentiality Code attribute on a DocumentEntry object allowing greater access to the underlying document
- Changing the Patient ID by stations/operators not technically competent to perform this operation

3.57.4.1.4.1 Audit Record Considerations

The Update Document Set transaction is PHI-Export event, as defined in ITI TF-2a: Table 3.20.6-1. The Actors involved in the transaction shall create audit data in conformance with DICOM (Supp 95) "Data Export"/"Data Import", with the following exceptions.

3.57.4.1.4.1.1 Document Administrator audit message

	Field Name	Opt	Value Constraints
Event **AuditMessage/ EventIdentification**	EventID	M	EV(110106, DCM, "Export")
	EventActionCode	M	"U" (Update)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-57", "IHE Transactions", "Update Document Set")
Source (Document Source) (1)			
Human Requestor (0..n)			
Destination (Document Repository) (1)			
Audit Source (Document Source) (1)			
Patient (1)			
SubmissionSet (1)			

Where:

Source **AuditMessage/ ActiveParticipant**	UserID	M	The content of the <wsa:ReplyTo/> element.
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	*U*	*not specialized*
	UserIsRequestor	M	"true"
	RoleIDCode	M	EV(110153, DCM, "Source")
	NetworkAccessPointTypeCode	M	"1" for machine (DNS) name, "2" for IP address
	NetworkAccessPointID	M	The machine name or IP address, as specified in RFC 3881.
Human Requestor (if known) **AuditMessage/ ActiveParticipant**	UserID	M	Identity of the human that initiated the transaction.
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	M	"true"
	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.
	NetworkAccessPointTypeCode	*NA*	
	NetworkAccessPointID	*NA*	

Destination **AuditMessage/ ActiveParticipant**	UserID	M	SOAP endpoint URI.
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	M	"false"
	RoleIDCode	M	EV(110152, DCM, "Destination")
	NetworkAccessPointTypeCode	M	"1" for machine (DNS) name, "2" for IP address
	NetworkAccessPointID	M	The machine name or IP address, as specified in RFC 3881.

Audit Source **AuditMessage/ AuditSourceIdentification**	*AuditSourceID*	*U*	*Not specialized.*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Patient **(AudittMessage/ ParticipantObjectIdentification)**	ParticipantObjectTypeCode	M	"1" (Person)
	ParticipantObjectTypeCodeRole	M	"1" (Patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(2, RFC-3881, "Patient Number")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The patient ID in HL7 CX format.
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	*U*	*not specialized*
Submission Set **(AudittMessage/ ParticipantObjectIdentification)**	ParticipantObjectTypeCode	M	"2" (System)
	ParticipantObjectTypeCodeRole	M	"20" (job)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("urn:uuid:a54d6aa5-d40d-43f9-88c5-b4633d873bdd", "IHE XDS Metadata", "submission set classificationNode")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The submissionSet unique ID
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	*U*	*not specialized*

3.57.4.1.4.1.2 Document Registry or Document Recipient audit message

	Field Name	Opt	Value Constraints
Event **AuditMessage/ EventIdentification**	EventID	M	EV(110107, DCM, "Import")
	EventActionCode	M	"U" (Update)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-41", "IHE Transactions", "Update Document Set")
Source (Document Source) (1)			
Destination (Document Repository or Document Recipient) (1)			
Audit Source (Document Repository or Document Recipient) (1)			

Patient (1)
SubmissionSet (1)

Where:

Source **AuditMessage/ ActiveParticipant**	UserID	M	The content of the <wsa:ReplyTo/> element.
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	M	"true"
	RoleIDCode	M	EV(110153, DCM, "Source")
	NetworkAccessPointTypeCode	M	"1" for machine (DNS) name, "2" for IP address
	NetworkAccessPointID	M	The machine name or IP address, as specified in RFC 3881.

Destination **AuditMessage/ ActiveParticipant**	UserID	M	SOAP endpoint URI
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	*U*	*not specialized*
	UserIsRequestor	M	"false"
	RoleIDCode	M	EV(110152, DCM, "Destination")
	NetworkAccessPointTypeCode	M	"1" for machine (DNS) name, "2" for IP address
	NetworkAccessPointID	M	The machine name or IP address, as specified in RFC 3881.

Audit Source **AuditMessage/ AuditSourceIdentification**	*AuditSourceID*	*U*	*Not specialized.*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Patient **(AuditMessage/ ParticipantObjectIdentification)**	ParticipantObjectTypeCode	M	"1" (Person)
	ParticipantObjectTypeCodeRole	M	"1" (Patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(2, RFC-3881, "Patient Number")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The patient ID in HL7 CX format.
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	***U***	*not specialized*
	ParticipantObjectDetail	*U*	*not specialized*
Submission Set **(AuditMessage/ ParticipantObjectIdentification)**	ParticipantObjectTypeCode	M	"2" (System)
	ParticipantObjectTypeCodeRole	M	"20" (job)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("urn:uuid:a54d6aa5-d40d-43f9-88c5-b4633d873bdd", "IHE XDS Metadata", "submission set classificationNode")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The submissionSet unique ID
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*

	ParticipantObjectDetail	*U*	*not specialized*

3.57.4.2 Update Document Set Response

3.57.4.2.1 Trigger Events

After receiving the Update Document Set request, the receiving actor processes the update capturing any errors that occur. When processing is complete the response message is triggered.

3.57.4.2.2 Message Semantics

The response message is the same RegistryResponse format used by the Register Document Set-b [ITI-42] Response. The resulting status shall be Success or Failure. PartialSuccess shall not be used. Errors reported shall include the entryUUID attribute value of the object triggering the error reported in the location attribute of the RegistryError element.

3.57.4.2.3 Expected Actions

There are no expectations placed on the Document Administrator actor when it receives this message.

3.57.5 Protocol Requirements

The Update Document Set request and response will be transmitted using Synchronous Web Service Exchange, according to the requirements specified in ITI TF-2x: Appendix V. The protocol requirements are identical to the Register Document Set-b [ITI-42] transaction except as noted below.

- The /definitions/message/part/@element attribute of the Update Document Set Request message shall be defined as "lcm:SubmitObjectsRequest"
- The /definitions/portType/operation/input/@wsaw:Action attribute for the Register Document Set-b Request message shall be defined as "urn:ihe:iti:2010:UpdateDocumentSet"
- The /definitions/portType/operation/output/@wsaw:Action attribute for the Update Document Set Response message shall be defined as "urn:ihe:iti:2010:UpdateDocumentSetResponse"
- The /definitions/binding/operation/soap12:operation/@soapAction attribute shall be defined as "urn:ihe:iti:2010:UpdateDocumentSet"

3.57.5.1 Sample SOAP Messages

```
<soapenv:Envelope xmlns:soapenv="http://www.w3.org/2003/05/soap-envelope">
    <soapenv:Header>
        <wsa:Action mustUnderstand="1"
            xmlns:wsa="http://www.w3.org/2005/08/addressing"
            >urn:ihe:iti:2010:UpdateDocumentSetResponse</wsa:Action>
        <wsa:RelatesTo xmlns:wsa="http://www.w3.org/2005/08/addressing"
            >urn:uuid:BED84881CA1EE76D5F1278983709130</wsa:RelatesTo>
    </soapenv:Header>
    <soapenv:Body>
        <rs:RegistryResponse
          status="urn:oasis:names:tc:ebxml-regrep:ResponseStatusType:Success"
          xmlns:rs="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0"/>
    </soapenv:Body>
</soapenv:Envelope>
```

3.57.5.2 Message Examples

A collection of examples is available on the IHE FTP site (See ITI TF-2x: Appendix W).

3.57.6 Actor Requirements

This section summarizes the responsibilities of the actors relevant to this transaction.

3.57.6.1 Document Administrator

A Document Administrator actor that implements the Update Metadata option shall be capable of generating at least one of the operations documented in ITI TF-2b: 3.57.4.1.3.3.

3.57.6.2 Document Registry

A Document Registry actor that implements the Document Metadata Update option shall be capable of all of the operations documented in ITI TF-2b: 3.57.4.1.3.3.

3.57.6.2 Document Recipient

A Document Recipient actor that implements the Document Metadata Update option shall be capable of all the operations documented in ITI TF-2b: 3.57.4.1.3.3.

Update to Vol 2b: 3.43.4.2.3 (Retrieve Document Set transaction)

3.43.4.2.3 Expected Actions

A Document Repository shall retrieve the document(s) indicated in the request.

The Document Repository shall return the document or an error code in case the document could not be retrieved. The conditions of failure and possible error messages are given in the ebRS standard and detailed in ITI TF-3: 4.1.13 Error Reporting.

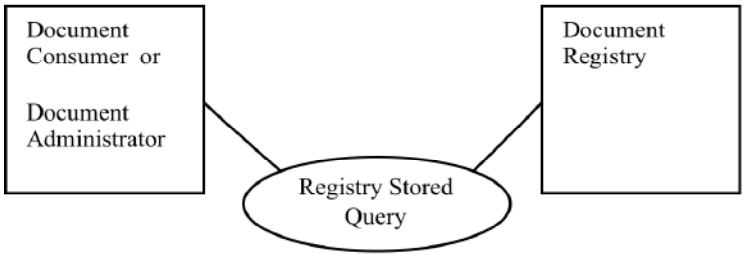
A document may not be available for retrieval because it is currently offline. See table ITI TF-3: 4-1.5 (documentAvailability) for details. A Document Repository is not required to indicate in its error response the reason the document cannot be retrieved.

Update to 3.18 Registry Stored Query transaction

Update to ITI Vol 2a: 3.18.2 Use Case Roles

Diagram includes updates (added Document Administrator)

3.18.2 Use Case Roles



Actor: Document Consumer **or Document Administrator**

Role: Requests a query by identifier (UUID), and passes parameters to the query. A parameter controlling the format of the returned data is passed, it selects either object references or full objects.

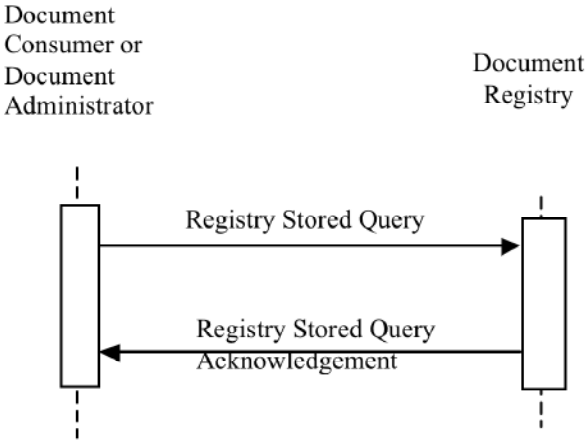
Actor: Document Registry

Role: Services the query using its stored definitions of the queries defined for XDS

Update to 3.18 Registry Stored Query transaction

Update to ITI Vol 2a: 3.18.4 Interaction Diagram

3.18.4 Interaction Diagram



3.18 Registry Stored Query

Add this section. Note the section number is odd. No extra numbering space was left in this section so I have to squeeze the section in.

3.18.4.1.2.3.5.1 Compatibility Issues

3.18.4.1.2.3.5.1.1 MetadataLevel parameter

As the XDS Metadata Model evolves over time there is a need to protect Document Consumer actor implementations from incompatible changes to the Stored Query transaction so that interoperability is not degraded by the installation of more modern Document Registry actor implementations alongside older Document Consumer implementations.

The introduction of metadata update functionality is an incompatible update to the XDS Metadata Model. The following new capabilities are likely to disrupt Document Consumer operation if it is not in some way protected:

- Labeling of a document as unavailable for retrieval (XDSDocumentEntry.documentAvailability attribute) – until the introduction of the optional Update Document Set [ITI-48] transaction, all documents indexed in the Document Registry were expected to be retrievable
- Deprecation of association objects – until the introduction of the optional Update Document Set [ITI-48] transaction, the status attribute on the association object (availabilityStatus attribute as documented by XDS) was not used by XDS. It can now be used to deprecate an association, transforming that association from an active part of the patient record into a historical part of the patient record.
- Deprecation of Folder objects – while some Stored Queries have a place to specify the availabilityStatus of Folder objects, others do not.

These three capabilities introduce metadata patterns that a pre-metadata update Document Consumer could incorrectly interpret parts of the medical record as expressed in XDS metadata. To guard against this, a new optional Stored Query parameter, $MetadataLevel, is introduced to most Stored Queries to allow the Document Consumer to specify which version of the XDS Metadata Model it can interpret. Queries where it is not available do not interact with the metadata update capabilities.

The default value of $MetadataLevel is 1 (one), if it is not present as a parameter then is values is assumed to be 1, indicating that the following metadata patterns shall not be returned in the Stored Query response:

- DocumentEntry objects containing the documentAvailability attribute with values other than `urn:ihe:iti:2010:DocumentAvailability:Online`.
- Association objects with availabilityStatus attribute with values other than `urn:oasis:names:tc:ebxml-regrep:StatusType:Approved`.
- Folder objects with availabilityStatus attribute set to the value `urn:oasis:names:tc:ebxml-regrep:StatusType:Approved`.

Individual Stored Queries may define more specific behavior if appropriate.

Stored Query requests coded with $MetadataLevel value of 2 shall return without the above restrictions as is appropriate for the individual Stored Query and its other parameters.

The $MetadataLevel parameter shall be coded as a number. See section ITI TF-18: 3.18.4.1.2.3.5.

3.18.4.1.2.3.5.1.2 Stored Query parameters added by Metadata Update option

The following parameters are added by the Metadata Update option.

Stored Query	Added parameters
FindDocuments	$XDSDocumentEntryDocumentAvailability
	$MetadataLevel
FindFolders	$MetadataLevel
GetAll	$XDSAssociationStatus
	$MetadataLevel
GetDocuments	$XDSDocumentEntryLogicalID
	$MetadataLevel
GetFolders	$XDSFolderLogicalID
	$MetadataLevel
GetAssociations	$XDSAssociationStatus

Stored Query	Added parameters
	$MetadataLevel
GetDocumentsAndAssociations	$XDSAssociationStatus
	$MetadataLevel
GetSubmissionSets	$MetadataLevel
GetSubmissionSetAndContents	$MetadataLevel
GetFolderAndContents	$XDSAssociationStatus
	$MetadataLevel
GetFoldersForDocument	$XDSAssociationStatus
	$MetadataLevel
GetRelatedDocuments	$XDSAssociationStatus
	$MetadataLevel

3.18.4.1.2.3.5.1.3 Metadata Update option compatibility

This section documents compatibility issues that arise between the Document Registry and Document Consumer with the implementation of the Metadata Update option.

Metadata Update not implemented by Document Registry or Document Consumer

- No issues

Metadata Update implemented by both Document Registry and Document Consumer

- No Issues

Metadata Update option implemented by Document Consumer but not Document Registry

- $MetadataLevel parameter specified in query, ignored by Document Registry
- Other new parameters specified in query, ignored by Document Registry
- In GetDocuments and GetFolders queries, the logicalID parameter can be specified. The Document Registry will not recognize it. The registry will recognize that neither the UUID nor uniqueID parameter is provided. An error will be returned. This may be the first indication the Document Consumer has that the Document Registry is not Metadata Update enabled. The Document Consumer must recover gracefully.
- Requests for deprecated Folders and Associations will not return the expected contents.
- The $XDSDocumentEntryDocumentAvailabilty parameter to FindDocuments will be ignored by the registry. The will cause no surprises since such a registry will not maintain the documentAvailability attribute.

Metadata Update option implemented by the Document Registry but not the Document Consumer

- The $MetadataLevel parameter will be 1 or not present. The Document Consumer may set $MetadataLevel to 1 if it wishes the query return to follow the no Metadata Update rules.
- The Document Registry shall return results consistent with pre-Metadata Update rules. See section ITI-TF 3.18.4.1.2.3.5.1.1 for details.

Update to FindDocuments section – add documentation to $XDSDocumentEntryStatus parameter

3.18.4.1.2.3.7.1 FindDocuments

Parameter Name	Attribute	Opt	Mult
$XDSDocumentEntryStatus[5]	XDSDocumentEntry.status	R	M
$XDSDocumentEntryDocumentAvailability	**XDSDocumentEntry.documentAvailability**	**O**	**M**
$MetadataLevel[6]	**None**	**O**	**--**

[5]If the Document Registry actor supports the Document Metadata Update option and this parameter includes the value urn:oasis:names:tc:ebxml-regrep:StatusType:Deprecated then the response may include multiple versions of a DocumentEntry object. See section ITI TF-3: 4.1.15 for guidance on interpreting these results.

[6]See section 3.18.4.1.2.3.5.1

Update to FindFolders section – add documentation to $XDSFolderStatus parameter

3.18.4.1.2.3.7.2 FindFolders

Parameter Name	Attribute	Opt	Mult
$XDSFolderStatus[4]	XDSFolder.status	R	M
$MetadataLevel[5]	**None**	**O**	**--**

[4]If the Document Registry actor supports the Document Metadata Update option and this parameter includes the value urn:oasis:names:tc:ebxml-regrep:StatusType:Deprecated then the response may include multiple versions of a Folder object. See section ITI TF-3: 4.1.15 for guidance on interpreting these results.

[5] The parameter setting of $MetadataLevel equals 1 shall not inhibit the return of non-Approved Folders. This is controlled only by $XDSFolderStatus. See section 3.18.4.1.2.3.5.1

Update to GetAll section – add documentation to $XDSDocumentEntry and $XDSFolderStatus parameters

3.18.4.1.2.3.7.3 GetAll

Get all registry content for a patient given the indicated status, format codes, and confidentiality codes.

Returns:

- XDSSubmissionSet, XDSDocumentEntry, and XDSFolder objects with patientId attribute matching $patientId parameter
- Association objects with sourceObject or targetObject attribute matching one of the above objects **and availabilityStatus matching one of the values in the $XDSAssociationStatus parameter. If this parameter is not supplied its value defaults to urn:oasis:names:tc:ebxml-regrep:StatusType:Approved**

Parameter Name	Attribute	Opt	Mult
$XDSDocumentEntryStatus[3]	XDSDocumentEntry.status	R	M
$XDSFolderStatus[3]	XDSFolder.status	R	M
$XDSAssociationStatus	**XDSAssociation.status**	**O**	**M**
$MetadataLevel[4]	**None**	**O**	**--**

[3] If the Document Registry actor supports the Document Metadata Update option and this parameter includes the value urn:oasis:names:tc:ebxml-regrep:StatusType:Deprecated then the response may include multiple versions of a DocumentEntry/Folder object. See section ITI TF-3: 4.1.15 for guidance on interpreting these results.

[4] The parameter setting of $MetadataLevel equals 1 shall not inhibit the return of non-Approved Folders. This is controlled only by $XDSFolderStatus. See section 3.18.4.1.2.3.5.1

Update to Vol 2a:– Add parameter to GetDocuments Stored Query to allow retrieval of DocumentEntry objects by their logicalID.

3.18.4.1.2.3.7.5 GetDocuments

Retrieve a collection of XDSDocumentEntry objects. XDSDocumentEntry objects are selected either by their entryUUID**,** ~~or~~ uniqueID**, or logicalID** attribute.

Parameter Name	Attribute	Opt	Mult
$XDSDocumentEntryEntryUUID	XDSDocumentEntry. entryUUID	O[1]	M

Parameter Name	Attribute	Opt	Mult
$XDSDocumentEntryUniqueId[4]	XDSDocumentEntry. uniqueId	O[1]	M
$XDSDocumentEntryLogicalID[3]	**XDSDocumentEntry.logicalID**	**O[1]**	**M**
$homeCommunityId	None	O[2]	--
$MetadataLevel[5]	**None**	**O**	**--**

[1]Either $XDSDocumentEntryEntryUUID or $XDSDocumentEntryUniqueId **or $XDSDocumentEntry.logicalID** shall be specified. This transaction shall return an error if ~~both~~ more than one of these parameters are specified.

[2]The homeCommunityId value is specified as the home attribute on the AdhocQuery element of the query request, as in: <AdhocQuery id="…" home="urn:oid:1.2.3" … >. Document Consumer actors shall specify the homeCommunityId value if they received a value for this attribute as part of the previous Registry Stored Query response entry, which contained the specified EntryUUID or UniqueID **or logicalID**.
See ITI TF-2a: 3.18.4.1.2.3.8 for more details.

[3]Retreiving a DocumentEntry by its logicalID attribute returns the logical DocumentEntry, which includes all versions of that DocumentEntry object. See section ITI TF-3: 4.1.15 for guidance on interpreting these results. If the Document Registry actor does not support the Document Metadata Update option this parameter is illegal.

[4]Specifying this parameter in a query to a Document Registry that supports the Document Metadata Update option may return multiple DocumentEntry objects each representing a different version of the metadata. See section ITI TF-3: 4.1.15 for guidance on interpreting these results.

[5]See section 3.18.4.1.2.3.5.1

Update to Vol 2a:– Add parameter to GetFolders Stored Query to allow retrieval of DocumentEntry objects by their logicalID.

3.18.4.1.2.3.7.6 GetFolders

Parameter Name	Attribute	Opt	Mult
$XDSFolderEntryUUID	XDSFolder. entryUUID	O[1]	M
$XDSFolderUniqueId[4]	XDSFolder. uniqueId	O[1]	M
$XDSFolderLogicalID[3]	**XDSFolder.logicalID**	**O[1]**	**M**
$homeCommunityId	None	O[2]	--
$MetadataLevel[5]	**None**	**O**	**--**

[1]Either $XDSFolderEntryUUID or $XDSFolderUniqueId **or $XDSFolder.logicalID** shall be specified. This transaction shall return an error if ~~both~~ more than one of these parameters are specified.

[2]The homeCommunityId value is specified as the home attribute on the AdhocQuery element of the query request, as in: <AdhocQuery id="…" home="urn:oid:1.2.3" … >. Document Consumer actors shall specify the homeCommunityId value if they received a value for this attribute as part of the previous Registry Stored Query response entry, which contained the specified EntryUUID or UniqueID **or logicalID**.
See ITI TF-2a: 3.18.4.1.2.3.8 for more details.

[3]Retreiving a Folder by its logicalID attribute returns the logical Folder, which includes all versions of that Folder object. See section ITI TF-3: 4.1.15 for guidance on interpreting these results. If the Document Registry actor does not support the Document Metadata Update option this parameter is illegal.

[4]Specifying this parameter in a query to a Document Registry that supports the Document Metadata Update option may return multiple Folder objects each representing a different version of the metadata. See section ITI TF-3: 4.1.15 for guidance on interpreting these results. Also see section ITI-TF-2a: 3.18.4.1.2.3.5.1 for considerations regarding $MetadataLevel.

[5]See section 3.18.4.1.2.3.5.1

Update to Vol 2a:– Add parameter to GetAssociations Stored Query.

3.18.4.1.2.3.7.7 GetAssociations

Parameter Name	Attribute	Opt	Mult
$XDSAssociationStatus[2]	**Association.status**	**O**	**M**
$MetadataLevel[3]	**None**	**O**	**--**

[2]This value shall default to urn:oasis:names:tc:ebxml-regrep:StatusType:Approved.

[3]See section 3.18.4.1.2.3.5.1

Update to Vol 2a:– Add footnote to GetDocumentsAndAssociations Stored Query. Also update text to show sensitivity to Association.availabilityStatus

3.18.4.1.2.3.7.8 GetDocumentsAndAssociations

Retrieve a collection of XDSDocumentEntry objects and the Association objects surrounding them. XDSDocumentEntry objects are selected either by their entryUUID or uniqueId attribute. This is the GetDocuments query and GetAssociations query combined into a single query. Returns:

- XDSDocumentEntry objects.
- Association objects whose sourceObject or targetObject attribute matches one of the above objects **and availabilityStatus matching one of the values in the $XDSAssociationStatus parameter. If this parameter is not supplied its value defaults to urn:oasis:names:tc:ebxml-regrep:StatusType:Approved.**

Parameter Name	Attribute	Opt	Mult
$XDSDocumentEntryUniqueId[3]	XDSDocumentEntry.uniqueId	O[1]	M
$XDSAssociationStatus	**XDSAssociation.status**	**O**	**M**
$MetadataLevel[4]	**None**	**O**	**--**

[3]Specifying this parameter in a query to a Document Registry that supports the Document Metadata Update option may return multiple DocumentEntry objects each representing a different version of the metadata. See section ITI TF-3: 4.1.15 for guidance on interpreting these results.

[4]See section 3.18.4.1.2.3.5.1

Update to Vol 2a: - Add $MetadataLevel parameter to parameter table

3.18.4.1.2.3.7.9 GetSubmissionSets

Parameter Name	Attribute	Opt	Mult
$MetadataLevel[2]	**None**	**O**	**--**

[2]See section 3.18.4.1.2.3.5.1

Update to Vol 2a: - Add $MetadataLevel parameter to parameter table

3.18.4.1.2.3.7.10 GetSubmissionSetAndContents

Parameter Name	Attribute	Opt	Mult
$MetadataLevel[5]	**None**	**O**	**--**

[5]See section 3.18.4.1.2.3.5.1

Update to Vol 2a:– Add footnote to GetFolderAndContents Stored Query. . Also update text to show sensitivity to Association.availabilityStatus

3.18.4.1.2.3.7.11 GetFolderAndContents

Retrieve an XDSFolder object and its contents. XDSFolder objects are selected either by their entryUUID or uniqueId attribute. The XDSDocumentEntry objects returned shall match one of the confidentiality codes listed if that parameter is included.
Returns:

- XDSFolder object specified in the query.
- Association objects of type HasMember that have a sourceObject attribute referencing the XDSFolder object specified in the query **and availabilityStatus matching one of the values in the $XDSAssociationStatus parameter. If this parameter is not supplied its value defaults to urn:oasis:names:tc:ebxml-regrep:StatusType:Approved.**
- XDSDocumentEntry objects referenced by the targetObject attribute of one of the Association objects specified above.

Parameter Name	Attribute	Opt	Mult
$XDSFolderUniqueId[5]	XDSFolder.uniqueId	O[1]	--
$XDSAssociationStatus	**XDSAssociation.status**	**O**	**M**
$MetadataLevel[6]	**None**	**O**	**--**

[5]Specifying this parameter in a query to a Document Registry that supports the Document Metadata Update option may return multiple Folder objects each representing a different version of the metadata. By the rules of this query, the contents of each version will also be returned. See section ITI TF-3: 4.1.15 for guidance on interpreting these results.
[6]See section 3.18.4.1.2.3.5.1

Update to Vol 2a:– Add footnote to GetFoldersForDocument Stored Query. . Also update text to show sensitivity to Association.availabilityStatus

3.18.4.1.2.3.7.12 GetFoldersForDocument

Retrieve XDSFolder objects that contain the XDSDocumentEntry object provided with the query. XDSDocumentEntry objects are selected either by their entryUUID or uniqueId attribute. Returns: XDSFolder objects that contain specified XDSDocumentEntry object. More specifically, for each Association object of type HasMember that has a targetObject attribute referencing the target XDSDocumentEntry object **and availabilityStatus matching one of the values in the $XDSAssociationStatus parameter (If this parameter is not supplied its value defaults to urn:oasis:names:tc:ebxml-regrep:StatusType:Approved)**, return the object referenced by its sourceObject if it is of type XDSFolder.

Parameter Name	Attribute	Opt	Mult
$XDSDocumentEntryUniqueId[3]	XDSDocumentEntry.uniqueId	O[1]	--
$XDSAssociationStatus	**XDSAssociation.status**	**O**	**M**
$MetadataLevel[4]	**None**	**O**	**--**

[3]Specifying this parameter in a query to a Document Registry that supports the Document Metadata Update option may return multiple DocumentEntry objects each representing a different version of the metadata. By the rules of this query, the Folders containing each version will also be returned. See section ITI TF-3: 4.1.15 for guidance on interpreting these results.

[4]See section 3.18.4.1.2.3.5.1

Update to Vol 2a:– Add footnote to GetRelatedDocuments Stored Query. . Also update text to show sensitivity to Association.availabilityStatus

3.18.4.1.2.3.7.13 GetRelatedDocuments

Retrieve XDSDocumentEntry objects that are related to the specified document via Association objects. Also return the Association objects. The specified document is designated by UUID or uniqueId. The query shall return

- Association objects where:
  - The sourceObject attribute OR the targetObject attribute references the specified document

    AND
  - **The availabilityStatus matching one of the values in the $XDSAssociationStatus parameter. If this parameter is not supplied its value defaults to urn:oasis:names:tc:ebxml-regrep:StatusType:Approved.**
- Both sourceObject attribute and targetObject attribute reference documents

  AND
- The associationType attribute matches a value included in the $AssociationTypes parameter

Parameter Name	Attribute	Opt	Mult
$XDSDocumentEntryUniqueId[3]	XDSDocumentEntry.uniqueId	O[1]	--
$XDSAssociationStatus	**XDSAssociation.status**	**O**	**M**

$MetadataLevel[4]	**None**	**O**	**--**

[3]Specifying this parameter in a query to a Document Registry that supports the Document Metadata Update option may return multiple DocumentEntry objects each representing a different version of the metadata. By the rules of this query, the results will include DocumentEntry objects related to each version of the DocumentEntry selected by its uniqueID. See section ITI TF-3: 4.1.15 for guidance on interpreting these results.

[4]See section 3.18.4.1.2.3.5.1.

Update to Registry Stored Query transaction

Update to ITI Vol 2a: 3.18.4.1

3.18.4.1.1 Trigger Events

This message is initiated when the Document Consumer **or Document Administrator** wants to query/retrieve document metadata.

Add this content to Vol 2b: 3.18.4.1.2.5 (currently labeled Intentionally Left Blank)

3.18.4.1.2.5 Options

The following options affect the operation of this transaction.

3.18.4.1.2.5.1 Document Metadata Update Option

When the Document Registry actor declares this option it affects this transaction as follows:

- **The logicalID and version attributes shall be returned in responses**
- **Multiple DocumentEntry objects may be returned carrying the same uniqueID attribute reflecting different versions of the object. At most one version shall have a non-Deprecated status.**

- **Multiple Folder objects may be returned carrying the same uniqueID attribute reflecting different versions of the object. At most one version shall have a non-Deprecated status.**
- **Association objects returned shall include the availabilityStatus attribute**
- **Association objects returned will include Slots that reflect the update history of the objects they reference.**

When the Document Consumer actor declares this option the above considerations apply. Such a Document Consumer shall be constructed considering the following effects:

- **Objects returned with availabilityStatus of Deprecated may carry attributes which are out of date but which reflected the best known information at the time of their submission**
- **Patient ID agreement is not guaranteed on Deprecated objects**
- **Relationship and Folder membership associations may be deprecated thus cancelling the relationship or membership**

Update to ITI TF-2a: 3.18.4.1.3 Expected Actions

Add this text to the end of this section

3.18.4.1.3 Expected Actions

The Document Consumer actor shall accept the metadata returned in the response and process it according to its own rules.

If the Document Consumer actor implements the Document Metadata Update option and it is querying an actor that implements the Document Metadata Update option then it shall:

1. **Use query options to control how much metadata is returned (control how many / which versions of an object are returned)**
2. **Distinguish between multiple versions of DocumentEntry and Folder objects**
3. **Recognize deprecated Folder and Association objects**
4. **Understand the use of logicalID and version attributes**

The Document Administrator actor may use the contents of this transaction to guide its submission of updates and deletions. If used it shall:

1. **Note the version attribute on DocumentEntry objects. This shall be submitted as the PreviousVersion attribute on the SubmissionSet to DocumentEntry HasMember association when updating the DocumentEntry metadata.**

2. **Note the value of the availabilityStatus on objects to be updated. This attribute is updated without changing the version of the object.**

The example metadata in this section is to be replaced

3.18.4.1.3.3 Sample Query Response

```
<?xml version="1.0" encoding="UTF-8"?>
<AdhocQueryResponse xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0"
    xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
    status="urn:oasis:names:tc:ebxml-regrep:ResponseStatusType:Success">
    <rim:RegistryObjectList>
        <rim:ExtrinsicObject xmlns:q="urn:oasis:names:tc:ebxml-
regrep:xsd:query:3.0"
            xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
            id="urn:uuid:08a15a6f-5b4a-42de-8f95-89474f83abdf"
            lid="urn:uuid:08a15a6f-5b4a-42de-8f95-89474f83abdf"
mimeType="text/xml"
            objectType="urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1"
            status="urn:oasis:names:tc:ebxml-regrep:StatusType:Approved">
            <rim:Slot name="authorInstitution">
                <rim:ValueList>
                    <rim:Value>Some
Hospital^^^^^^^^^1.2.3.4.5.6.7.8.9.1789.45</rim:Value>
                </rim:ValueList>
            </rim:Slot>
            <rim:Slot name="creationTime">
                <rim:ValueList>
                    <rim:Value>200412261119</rim:Value>
                </rim:ValueList>
            </rim:Slot>
            <rim:Slot name="hash">
                <rim:ValueList>

<rim:Value>4cf4f82d78b5e2aac35c31bca8cb79fe6bd6a41e</rim:Value>
                </rim:ValueList>
            </rim:Slot>
            <rim:Slot name="languageCode">
                <rim:ValueList>
```

```
                    <rim:Value>en-us</rim:Value>
                </rim:ValueList>
            </rim:Slot>
            <rim:Slot name="serviceStartTime">
                <rim:ValueList>
                    <rim:Value>200412230800</rim:Value>
                </rim:ValueList>
            </rim:Slot>
            <rim:Slot name="serviceStopTime">
                <rim:ValueList>
                    <rim:Value>200412230801</rim:Value>
                </rim:ValueList>
            </rim:Slot>
            <rim:Slot name="size">
                <rim:ValueList>
                    <rim:Value>54449</rim:Value>
                </rim:ValueList>
            </rim:Slot>
            <rim:Slot name="sourcePatientId">
                <rim:ValueList>
                    <rim:Value>jd12323^^^&amp;1.2.3&amp;ISO</rim:Value>
                </rim:ValueList>
            </rim:Slot>
            <rim:Slot name="sourcePatientInfo">
                <rim:ValueList>
                    <rim:Value>PID-3|pid1^^^&amp;3.4.5.6&amp;ISO</rim:Value>
                    <rim:Value>PID-5|Doe^John^^^</rim:Value>
                    <rim:Value>PID-7|19560527</rim:Value>
                    <rim:Value>PID-8|M</rim:Value>
                    <rim:Value>PID-11|100 Main
St^^Metropolis^Il^44130^USA</rim:Value>
                </rim:ValueList>
            </rim:Slot>
            <rim:Name>
                <rim:LocalizedString charset="UTF-8" value="Sample document
1" xml:lang="en-us"/>
            </rim:Name>
            <rim:Description/>
            <VersionInfo versionName="1"/>
            <rim:Classification classificationScheme="urn:uuid:41a5887f-8865-
4c09-adf7-e362475b143a"
                classifiedObject="urn:uuid:08a15a6f-5b4a-42de-8f95-
89474f83abdf"
```



```
                id="urn:uuid:ac872fc0-1c6e-439f-84d1-f76770a0ccdf"
                lid="urn:uuid:ac872fc0-1c6e-439f-84d1-f76770a0ccdf"
nodeRepresentation="Education"
                objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification">
                <rim:Slot name="codingScheme">
                    <rim:ValueList>
                        <rim:Value>Connect-a-thon classCodes</rim:Value>
                    </rim:ValueList>
                </rim:Slot>
                <rim:Name>
                    <rim:LocalizedString charset="UTF-8" value="Education"
xml:lang="en-us"/>
                </rim:Name>
                <rim:Description/>
                <VersionInfo versionName="1"/>
            </rim:Classification>
            <rim:Classification classificationScheme="urn:uuid:f4f85eac-e6cb-
4883-b524-f2705394840f"
                classifiedObject="urn:uuid:08a15a6f-5b4a-42de-8f95-
89474f83abdf"
                id="urn:uuid:f1a8c8e4-3593-4777-b7e0-8b0773378705"
                lid="urn:uuid:f1a8c8e4-3593-4777-b7e0-8b0773378705"
nodeRepresentation="C"
                objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification">
                <rim:Slot name="codingScheme">
                    <rim:ValueList>
                        <rim:Value>Connect-a-thon
confidentialityCodes</rim:Value>
                    </rim:ValueList>
                </rim:Slot>
                <rim:Name>
                    <rim:LocalizedString charset="UTF-8" value="Celebrity"
xml:lang="en-us"/>
                </rim:Name>
                <rim:Description/>
                <VersionInfo versionName="1"/>
            </rim:Classification>
            <rim:Classification classificationScheme="urn:uuid:a09d5840-386c-
46f2-b5ad-9c3699a4309d"
                classifiedObject="urn:uuid:08a15a6f-5b4a-42de-8f95-
89474f83abdf"
                id="urn:uuid:b6e49c73-96c8-4058-8c95-914d83bd262a"
                lid="urn:uuid:b6e49c73-96c8-4058-8c95-914d83bd262a"
```

```
                nodeRepresentation="CDAR2/IHE 1.0"
                objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification">
                <rim:Slot name="codingScheme">
                    <rim:ValueList>
                        <rim:Value>Connect-a-thon formatCodes</rim:Value>
                    </rim:ValueList>
                </rim:Slot>
                <rim:Name>
                    <rim:LocalizedString charset="UTF-8" value="CDAR2/IHE
1.0" xml:lang="en-us"/>
                </rim:Name>
                <rim:Description/>
                <VersionInfo versionName="1"/>
            </rim:Classification>
            <rim:Classification classificationScheme="urn:uuid:f33fb8ac-18af-
42cc-ae0e-ed0b0bdb91e1"
                classifiedObject="urn:uuid:08a15a6f-5b4a-42de-8f95-
89474f83abdf"
                id="urn:uuid:61e2b376-d74a-4984-ac21-dcd0b8890f9d"
                lid="urn:uuid:61e2b376-d74a-4984-ac21-dcd0b8890f9d"
                nodeRepresentation="Emergency Department"
                objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification">
                <rim:Slot name="codingScheme">
                    <rim:ValueList>
                        <rim:Value>Connect-a-thon
healthcareFacilityTypeCodes</rim:Value>
                    </rim:ValueList>
                </rim:Slot>
                <rim:Name>
                    <rim:LocalizedString charset="UTF-8" value="Assisted
Living" xml:lang="en-us"/>
                </rim:Name>
                <rim:Description/>
                <VersionInfo versionName="1"/>
            </rim:Classification>
            <rim:Classification classificationScheme="urn:uuid:cccf5598-8b07-
4b77-a05e-ae952c785ead"
                classifiedObject="urn:uuid:08a15a6f-5b4a-42de-8f95-
89474f83abdf"
                id="urn:uuid:fb7677c5-c42f-485d-9010-dce0f3cd4ad5"
                lid="urn:uuid:fb7677c5-c42f-485d-9010-dce0f3cd4ad5"
nodeRepresentation="Cardiology"
```

```
                objectType="Urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification">
                <rim:Slot name="codingScheme">
                    <rim:ValueList>
                        <rim:Value>Connect-a-thon
practiceSettingCodes</rim:Value>
                    </rim:ValueList>
                </rim:Slot>
                <rim:Name>
                    <rim:LocalizedString charset="UTF-8" value="Cardiology"
xml:lang="en-us"/>
                </rim:Name>
                <rim:Description/>
                <VersionInfo versionName="1"/>
            </rim:Classification>
            <rim:Classification classificationScheme="urn:uuid:f0306f51-975f-
434e-a61c-c59651d33983"
                classifiedObject="urn:uuid:08a15a6f-5b4a-42de-8f95-
89474f83abdf"
                id="urn:uuid:0a8a8ed9-8be5-4a63-9b68-a511adee8ed5"
                lid="urn:uuid:0a8a8ed9-8be5-4a63-9b68-a511adee8ed5"
nodeRepresentation="34098-4"
                objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification">
                <rim:Slot name="codingScheme">
                    <rim:ValueList>
                        <rim:Value>LOINC</rim:Value>
                    </rim:ValueList>
                </rim:Slot>
                <rim:Name>
                    <rim:LocalizedString charset="UTF-8" value="Conference
Evaluation Note"
                        xml:lang="en-us"/>
                </rim:Name>
                <rim:Description/>
                <VersionInfo versionName="1"/>
            </rim:Classification>
            <rim:ExternalIdentifier id="urn:uuid:db9f4438-ffff-435f-9d34-
d76190728637"
                lid="urn:uuid:db9f4438-ffff-435f-9d34-d76190728637"
                registryObject="urn:uuid:08a15a6f-5b4a-42de-8f95-
89474f83abdf"
                identificationScheme="urn:uuid:58a6f841-87b3-4a3e-92fd-
a8ffeff98427"
                objectType="ExternalIdentifier"
```

```
                value="st3498702^^^&amp;1.3.6.1.4.1.21367.2005.3.7&amp;ISO">
                <rim:Name>
                    <rim:LocalizedString charset="UTF-8"
value="XDSDocumentEntry.patientId"
                        xml:lang="en-us"/>
                </rim:Name>
                <rim:Description/>
                <VersionInfo versionName="1"/>
            </rim:ExternalIdentifier>
            <rim:ExternalIdentifier id="urn:uuid:c3fcbf0e-9765-4f5b-abaa-
b37ac8ff05a5"
                lid="urn:uuid:c3fcbf0e-9765-4f5b-abaa-b37ac8ff05a5"
                registryObject="urn:uuid:08a15a6f-5b4a-42de-8f95-
89474f83abdf"
                identificationScheme="urn:uuid:2e82c1f6-a085-4c72-9da3-
8640a32e42ab"
                objectType="ExternalIdentifier"
value="1.3.6.1.4.1.21367.2005.3.99.1.1010">
                <rim:Name>
                    <rim:LocalizedString charset="UTF-8"
value="XDSDocumentEntry.uniqueId"
                        xml:lang="en-us"/>
                </rim:Name>
                <rim:Description/>
                <VersionInfo versionName="1"/>
            </rim:ExternalIdentifier>
        </rim:ExtrinsicObject>
    </rim:RegistryObjectList>
</AdhocQueryResponse>
```

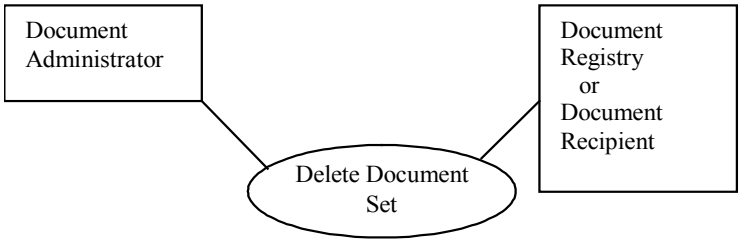

3.62 Delete Document Set

This section corresponds to Transaction 62 of the IHE ITI Technical Framework. Transaction 62 is used by the Document Administrator, Document Recipient and Document Registry actors.

3.62.1 Scope

The Delete Document Set transaction deletes arbitrary metadata objects from a Document Registry or Document Recipient based on a list of entryUUID attribute describing the objects.

3.62.2 Use Case Roles



Actor: Document Administrator

Role: Issues metadata delete requests to Document Registry

Actor: Document Registry or Document Recipient

Role: Accepts metadata delete requests

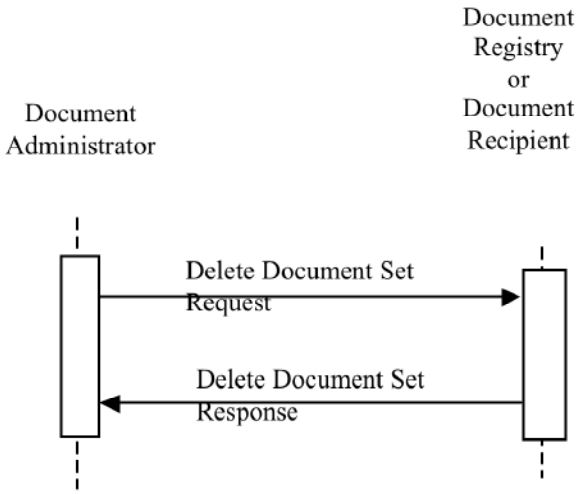
3.62.3 Referenced Standard

Implementers of this transaction shall comply with all requirements described in ITI TF-2x: Appendix V: Web Services for IHE Transactions.

ebRIM	OASIS/ebXML Registry Information Model v3.0
ebRS	OASIS/ebXML Registry Services Specifications v3.0
Appendix V	ITI TF-2x:Appendix V Web Services for IHE Transactions Contains references to all Web Services standards and requirements of use

3.62.4 Interaction Diagram

<the interaction diagram shows the detailed standards-based message exchange that makes up the IHE transaction>



3.62.4.1 Delete Document Set Request

An ebRS RemoveObjectsRequest containing a list of ObjectRefs identifying objects to be deleted from the Document Registry. The primary documentation for this transaction is in ebRS chapter 5.6 The Remove Objects Protocol.

3.62.4.1.1 Trigger Events

The Document Administrator actor identifies a collection of objects to be deleted.

3.62.4.1.2 Message Semantics

The Document Administrator actor is responsible to discover the entryUUID attribute value of the objects that are to be deleted through the Registry Stored Query [ITI-18] transaction or known history of the metadata. The entryUUID attribute values are packaged as an ObjectRef list in the request message.

Since a DocumentEntry always has at least a HasMember association to its SubmissionSet and an object cannot be deleted while association objects still reference it, to delete the DocumentEntry, the minimal deletion request is for the DocumentEntry and Association objects.

The ebRS 3.0 RemoveObjectsRequest message shall be used. The following restrictions shall be followed:

1. The AdhocQuery parameter shall not be specified. Deletions are specified only by the ObjectRefList.
2. The deletionScope parameter shall not be specified.

3.62.4.1.3 Expected Actions

The Document Registry or Document Recipient actor deletes the objects indicated in the message. The two key errors are:

- UnresolvedReferenceException – an entryUUID passed does not exist in the recipient system
- ReferencesExistException – an object to be removed is referenced by other metadata in the recipient system. An example of this is the attempted deletion of a DocumentEntry that still has an APND association referencing it. One fix for this problem is to include the entryUUID of the APND association in the delete request.

Additional documentation is available in ebRS 3.0 section 5.6.1.4.

3.62.4.2 Delete Document Set Response

An ebRS RegistryResponse message returning overall status and optionally carrying errors back to the requestor.

3.62.4.2.1 Trigger Events

Processing of Delete Document Set Request is complete.

3.62.4.2.2 Message Semantics

The operation status and optional error list is returned in a RegistryResponse message. The two key errors are:

- UnresolvedReferenceException – an entryUUID passed does not exist in the recipient system
- ReferencesExistException – an object to be removed is referenced by other metadata in the recipient system. An example of this is the attempted deletion of a DocumentEntry that still has an APND association referencing it. One fix for this problem is to include the entryUUID of the APND association in the delete request.

Additional documentation is available in ebRS 3.0 section 5.6.1.4.

Details on how to construct a RegistryResponse are discussed in ITI TF-3: 4.1.13.

3.62.4.2.3 Expected Actions

None

3.62.4.2.4 Security Considerations

TBD

3.62.5 Protocol Requirements

The Delete Document Set request and response will be transmitted using Synchronous Web Service Exchange, according to the requirements specified in ITI TF-2x: Appendix V. The

protocol requirements are identical to the Register Document Set-b [ITI-42] transaction except as noted below.

- The /definitions/message/part/@element attribute of the Delete Document Set Request message shall be defined as "lcm:RemoveObjectsRequest"
- The /definitions/portType/operation/input/@wsaw:Action attribute for the Delete Document Set Request message shall be defined as "urn:ihe:iti:2010:DeleteDocumentSet"
- The /definitions/portType/operation/output/@wsaw:Action attribute for the Delete Document Set Response message shall be defined as "urn:ihe:iti:2010:DeleteDocumentSetResponse"
- The /definitions/binding/operation/soap12:operation/@soapAction attribute shall be defined as"urn:ihe:iti:2010:DeleteDocumentSet"

3.62.5.1 Sample Messages

3.62.5.1.1 Request

```
<lcm:RemoveObjectsRequest
   xmlns:lcm="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0">
    <ObjectRefList xmlns="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0">
        <ObjectRef id="urn:uuid:b2632452-1de7-480d-94b1-c2074d79c871"/>
        <ObjectRef id="urn:uuid:b2632df2-1de7-480d-1045-c2074d79aabd"/>
        <ObjectRef id="urn:uuid:b2632132-1de7-480d-88bd-c2074d79009b"/>
        <ObjectRef id="urn:uuid:b2632cd2-1de7-480d-108c-c2074d797777"/>
    </ObjectRefList>
</lcm:RemoveObjectsRequest>
```

3.62.5.1.2 Response

```
<rs:RegistryResponse xmlns:rs="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0"
       status="urn:oasis:names:tc:ebxml-regrep:ResponseStatusType:Success"/>
```

3.62.5.1.3 Message Examples

A collection of examples are available on the IHE FTP site (See ITI TF-2x: Appendix W).

3.62.6 Actor Requirements

This section summarizes the responsibilities of the actors relevant to this transaction.

3.62.6.1 Document Administrator

An implementation of the Document Administrator actor that implements the Delete Metadata option shall be capable of generating the Delete Document Set transaction.

3.62.6.2 Document Registry

An implementation of the Document Registry actor that implements the Document Metadata Update option shall be capable of processing the Delete Document Set transaction.

3.62.6.3 Document Recipient

An implementation of the Document Recipient actor that implements the Document Metadata Update option shall be capable of processing the Delete Document Set transaction.

Volume 3 Cross-Transaction and Content Specifications

4.1 XDS Metadata

4.1.6 Document Relationships and Associations

4.1.6.3 Association Type formatting

This table is heavily updated and edited. It now contains entries supporting the Metadata Update and the On-Demand Documents Supplements.

Table 4.1.6.3-2 Association Types used in XDS and related profiles

Meaning	ebRIM 3.0 Format associationType	Transaction [1]
Membership in a Registry Package (SubmissionSet or Folder)	urn:oasis:names:tc:ebxml-regrep:AssociationType:HasMember	**P,R, U**
Replacement	urn:ihe:iti:2007:AssociationType:RPLC	**P,R,U**
Transformation	urn:ihe:iti:2007:AssociationType:XFRM	**P,R,U**
Addendum	urn:ihe:iti:2007:AssociationType:APND	**P,R,U**
Replacement with Transformation	urn:ihe:iti:2007:AssociationType:XFRM_RPLC	**P,R,U**
Digital Signature	urn:ihe:iti:2007:AssociationType:signs	**P,R,U**
availabiltyStatus update	**urn:ihe:iti:2010:AssociationType:UpdateAvailabilityStatus**	**U**
Snapshot of On-Demand document entry	**urn:ihe:iti:2010:AssociationType:IsSnapshotOf**	**P,R,U**
Submit arbitrary Association	**urn:ihe:iti:2010:AssociationType:SubmitAssociation**	**U**

[1] – Transactions where this Association type shall be used

P – Provide and Register Document Set

R – Register Document Set

U – Update Document Set

This is a new section being added to Volume 3 to improve documentation of Associations. It documents existing XDS/XDR usage as well as metadata update usage. In the future all documentation on the use of Associations will be moved here.

4.1.6.4 Association Formatting

Association objects are used to link DocumentEntry, SubmissionSet, Folder, and Association objects to show these objects have a relationship. The format of an Association object depends on how it is used. This section documents the Association formats used.

The basic Association format, as defined in ebRIM, includes the id, status, associationType, sourceObject, and targetObject attributes:

Example of basic Association

```
<rim:Association
  id="urn:uuid:95e9115b-3d90-46ae-9610-ed34fd683d96"
  status="urn:oasis:names:tc:ebxml-regrep:StatusType:Approved"
  associationType="urn:ihe:iti:2007:AssociationType:RPLC"
  sourceObject="urn:uuid:3cce0135-cedb-4a26-ba00-8698ee8dde04"
  targetObject="urn:uuid:e0985823-dc50-45a5-a6c8-a11a829893bd"/>
```

The associationType is always a URN. The sourceObject and targetObject are UUID or symbolic format depending on where they are used. Symbolic format is allowable only in submissions. The status attribute shall not be submitted but shall be returned from queries.

The ebRIM standard allows the full collection of attribute types to be used inside an Association. This specification uses Slots and Classifications.

All Associations included in the Update Document Set transaction shall have an id (entryUUID) attribute. It may have UUID or symbolic format. This attribute is necessary when reporting errors in the Update Document Set Response message.

The id attribute is only necessary in other submissions if another Association in the submission references this Association.

The rest of this section defines the types of Associations used and their annotations. The types are categorized into relationship, membership, and trigger. The annotations are used to document or force behaviors.

4.1.6.4.1 Relationship Associations

Relationship Associations are Associations that link two DocumentEntry objects. They are divided into the following groups with each group carrying special semantics and processing:

- RPLC/RPLC_XFRM
- APND/XFRM/signs
- IsSnapshotOf

4.1.6.4.1.1 RPLC and RPLC_XFRM Relationship Associations

These associations document a Replace or Replace with Transformation relationship. These are special relationships because their submission forces a side effect within the Registry/Recipient: namely deprecation of the original replaced DocumentEntry.

Example RPLC Association

```
<rim:Association
  associationType="urn:ihe:iti:2007:AssociationType:RPLC"
  sourceObject="MyDocument"
  targetObject="urn:uuid:e0985823-dc50-45a5-a6c8-a11a829893bd"/>

<rim:ExtrinsicObject id="MyDocument"
         objectType="urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1">
. . .
</rim:ExtrinsicObject>
```

The sourceObject references the replacement DocumentEntry. The replacement DocumentEntry is required to be present in the submission. The reference is frequently coded as a symbolic reference, as shown.

The targetObject always references an object already in the Registry; it shall be coded in UUID format, as shown.

A stub DocumentEntry is shown to illustrate the id reference coding (Association sourceObject attribute referencing the id attribute of the DocumentEntry/ExtrinsicObject in the submission).

The Document Registry or Document Recipient actor shall verify upon submission:

- The sourceObject references a DocumentEntry in the submission
- The targetObject references a DocumentEntry in the Registry or Recipient
- The targetObject DocumentEntry has availabilityStatus of Approved
- Verify that the objectType attribute of the sourceObject DocumentEntry and the targetObject DocumentEntry have the same value. On-Demand DocumentEntries have a different objectType than Stable DocumentEntries.

Note: this example does not show the SubmissionSet object or the SubmissionSet to DocumentEntry HasMember association.

4.1.6.4.1.2 APND/XFRM/signs Relationship Associations

The addendum, transformation and digital signature relationships.

Example APND Association

```
<rim:Association
  associationType="urn:ihe:iti:2007:AssociationType:APND"
  sourceObject="MyDocument"
  targetObject="urn:uuid:e0985823-dc50-45a5-a6c8-a11a829893bd"/>

<rim:ExtrinsicObject id="MyDocument"
         objectType=" urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1">
. . .
</rim:ExtrinsicObject>
```

The sourceObject references the DocumentEntry that represents the addendum, transformation, or signature document. This DocumentEntry is required to be present in the submission. The reference is frequently coded as a symbolic reference, as shown.

The targetObject always references an object already in the Registry/Recipient, it is always coded in UUID format, as shown.

A stub DocumentEntry is shown to illustrate the id reference coding (Association sourceObject attribute referencing the id attribute of the DocumentEntry/ExtrinsicObject in the submission).

The Document Registry actor shall verify upon receipt:

- The sourceObject references a DocumentEntry in the submission
- The targetObject references a DocumentEntry in the Registry
- The targetObject DocumentEntry has availabilityStatus of Approved

Note: this example does not show the SubmissionSet object or the SubmissionSet to DocumentEntry HasMember association.

4.1.6.4.1.3 IsSnapshotOf

This Association type is further documented in the On-Demand Supplement which refers to this section for these details.

When the content of an On-Demand DocumentEntry is retrieved, the retrieved version can be saved in a Document Repository as a Document and recorded in the Document Registry as a Stable DocumentEntry. When this happens, the saved version is linked to the On-Demand DocumentEntry through the IsSnapshotOf Association.

Example IsSnapshotOf Association

```
<rim:Association
  associationType="urn:ihe:iti:2010:AssociationType:IsSnapshotOf"
  sourceObject="Snapshot"
```



```
  targetObject="urn:uuid:e0985823-dc50-45a5-a6c8-a11a829893bd"/>

<rim:ExtrinsicObject id="Snapshot"
      objectType="urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1">
. . .
</rim:ExtrinsicObject>
```

This Association shall be submitted together with the Stable DocumentEntry representing the snapshot of the On-Demand Document. The sourceObject attribute references the snapshot and the targetObject references the On-Demand DocumentEntry already in the Registry.

The Document Registry actor shall verify upon submission:

- The sourceObject references a DocumentEntry in the submission
- The targetObject references a DocumentEntry in the Registry
- The targetObject DocumentEntry has availabilityStatus of Approved
- Verify that the objectType attribute of the sourceObject DocumentEntry is `urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1` (Stable)
- Verify that the objectType attribute of the targetObject DocumentEntry is `urn:uuid:34268e47-fdf5-41a6-ba33-82133c465248` (On-Demand)

Note: this example does not show the SubmissionSet object or the SubmissionSet to DocumentEntry HasMember association.

4.1.6.4.1.4 SubmitAssocation

When an Association is submitted via the Update Document Set transaction Submit Associations operation (see section ITI TF-2b: 3.57.4.1.3.3.6) to repair metadata it is linked to the SubmissionSet object via the SubmitAssociation Association type.

Example of SubmitAssociation association type

```
<Association
  id="ID_01"
  associationType="urn:ihe:iti:2010:AssociationType:SubmitAssociation"
  sourceObject="SubmissionSet"
  targetObject="apnd_assoc"/>

<Association
  id="apnd_assoc"
  associationType="urn:ihe:iti:2007:AssociationType:APND"
  sourceObject="urn:uuid:8ace0e1c-7dd9-47a0-9e7d-d673beb052e0"
  targetObject="urn:uuid:aa0da13b-51b0-4c2e-868c-cef8d7e1bc3d"/>
```

The Document Registry actor shall verify upon submission:

- The SubmitAssociation association sourceObject attribute references the SubmissionSet object

- The SubmitAssociation association targetObject attribute references an association present in the submission
- The referenced association shall have:
  - SourceObject and targetObject attributes reference objects already present in the recipient system (which implies UUID format).
  - The associationType is appropriate for the objects referenced

4.1.6.4.2 Membership Associations

SubmissionSets and Folders can have members. SubmissionSets can have DocumentEntry or Folder objects as members. Folders can only have DocumentEntry objects as members.

The HasMember Association type shall be used to show membership with the sourceObject attribute pointing to the SubmissionSet or Folder and the targetObject attribute pointing to the member object. This Association can have annotations as documented below.

4.1.6.4.2.1 SubmissionSet HasMember

The SubmissionSet HasMember Association shall be submitted in these transactions:

- Provide and Register Document Set-b
- Register Document Set-b
- Update Document Set

to link DocumentEntry, Folder, and some Association objects to the SubmissionSet object. It shall be used to link to an Association object when the Association object:

- Links a DocumentEntry to a Folder (documenting which submission added the DocumentEntry to the Folder)

Example SubmissionSet – Folder HasMember Association

```
<rim:Association
  associationType="urn:oasis:names:tc:ebxml-regrep:AssociationType:HasMember"
  sourceObject="SubmissionSet01"
  targetObject="Folder01">
</rim:Association>
```

The sourceObject and targetObject attributes are shown using symbolic names to reference the other objects in the submission. UUID format values could have been used if those objects were coded that way.

Example SubmissionSet – DocumentEntry HasMember Association

```
<rim:Association
  associationType="urn:oasis:names:tc:ebxml-regrep:AssociationType:HasMember"
  sourceObject="SubmissionSet01"
  targetObject="Document01">
```



```
    <rim:Slot name="SubmissionSetStatus">
       <rim:ValueList>
          <rim:Value>Original</rim:Value>
       </rim:ValueList>
    </rim:Slot>
</rim:Association>
```

The use of the SubmissionSetStatus Slot is described in section ITI TF-3: 4.1.6.4.4.1.

Example SubmissionSet – DocumentEntry HasMember Association as part of an update

```
<Association
  associationType="urn:oasis:names:tc:ebxml-regrep:AssociationType:HasMember"
  sourceObject="SubmissionSet01"
  targetObject="Document01">
    <Slot name="SubmissionSetStatus">
       <ValueList>
          <Value>Original</Value>
       </ValueList>
    </Slot>
    <Slot name="PreviousVersion">
       <ValueList>
          <Value>1</Value>
       </ValueList>
    </Slot>
</Association>
```

If the SubmissionSet is submitted in an Update Document Set transaction and the update includes a DocumentEntry or Folder then the HasMember Association linking the DocumentEntry/Folder to the SubmissionSet shall include a PreviousVersion annotation. See section ITI TF-3: 4.1.6.4.4.6 for details

If the above example were applied to a Folder, it would not contain the SubmissionSetStatus annotation, which only applies to DocumentEntries.

4.1.6.4.2.2 Folder HasMember

A Folder HasMember Association links a Folder object to one of its member DocumentEntry objects.

Example Folder HasMember Association

```
<Association
  id="FolderToDocAssoc"
  associationType="urn:oasis:names:tc:ebxml-regrep:AssociationType:HasMember"
  sourceObject="urn:uuid:e0985823-dc50-45a5-a6c8-a11a8298aabb"
```



```
  targetObject="urn:uuid:e0985823-dc50-45a5-a6c8-a11a829893bd"/>

<Association
  associationType="urn:oasis:names:tc:ebxml-regrep:AssociationType:HasMember"
  sourceObject="SubmissionSet"
  targetObject="FolderToDocAssoc"/>
```

This association may be part of the same submission that contains the DocumentEntry, the Folder, both, or neither. Since both the sourceObject and targetObject attributes in the example are in UUID format, the Folder and the DocumentEntry referenced could be part of this submission or already present in the registry.

The second Association shown is between the SubmissionSet and the first Association documenting which submission added the DocumentEntry to the Folder.

When the Document Registry/Recipient actor detects:

- The HasMember association in the submission and
- The sourceObject attribute references a Folder in the submission or in the registry

Then it shall verify that:

- The targetObject references a DocumentEntry in the submission or registry.
- If the targetObject is in the registry then it shall have availabilityStatus of Approved.
- There is also a HasMember association linking the SubmissionSet to the Folder-DocumentEntry association.

Note: this example does not show the SubmissionSet object.

4.1.6.4.3 Trigger Associations

Trigger Associations shall only be used in the Update Document Set transaction. They are always attached to the SubmissionSet object through their sourceObject attribute. The association type indicates the action to be triggered in the Document Registry or Document Recipient actor. The targetObject attribute identifies the object in the receiving actor to be affected.

4.1.6.4.3.1 UpdateAvailabilityStatus

The object referenced by the targetObject attribute of this Association shall have its availabilityStatus attribute set to a new value. The targetObject attribute shall reference an object already present in the receiving actor. This object shall be of type Association, DocumentEntry or Folder. If it is of type DocumentEntry or Folder, it shall be the most recent version of that object.

This Association shall have two annotations: NewStatus and OriginalStatus. The receiving actor shall verify that the availabilityStatus of the targetObject matches the OriginalStatus annotation.

The targetObject shall then have its availabilityStatus attribute changed to the value in the NewStatus annotation.

Example

```
<Association
  associationType="urn:ihe:iti:2010:AssociationType:UpdateAvailabilityStatus"
  sourceObject="SubmissionSet"
  targetObject="urn:uuid:e0985823-dc50-45a5-a6c8-a11a829893bd">
    <Slot name="NewStatus">
       <ValueList>
          <Value>urn:oasis:names:tc:ebxml-
regrep:StatusType:Deprecated</Value>
       </ValueList>
    </Slot>
    <Slot name="OriginalStatus">
       <ValueList>
          <Value>urn:oasis:names:tc:ebxml-regrep:StatusType:Approved</Value>
       </ValueList>
    </Slot>
</Association>
```

This example shows the deprecation of either a DocumentEntry, Folder, or Association. Accessing the Registry Object behind the targetObject attribute UUID is the only way to know which of these three kinds of objects is being updated.

4.1.6.4.4 Annotations

Annotations are added to Associations for one of three reasons:

- Describe the source or target object
- Describe the reason for the Association
- Force some processing by the recipient of the submission (Document Registry or Document Recipient actors)

Annotations are specific to the type of object referenced by the source and target objects and to the association type.

Annotations are coded as Slots or Classifications inside the Association object.

4.1.6.4.4.1 SubmissionSetStatus

This annotation shall only be used on SubmissionSet to DocumentEntry HasMember Associations. Details of this annotation are documented in section ITI TF-3: 4.1.4.1.

4.1.6.4.4.2 Relationship Description

This annotation shall only be used on relationship Associations as documented in section ITI TF-3: 4.1.6.1.

4.1.6.4.4.3 NewStatus

This annotation shall only be used on SubmissionSet UpdateAvailabilityStatus Associations. It shall be coded as a Slot with a single value. It carries the new value of availabilityStatus to be assigned to the registry object identified by the targetObject attribute.

4.1.6.4.4.4 OriginalStatus

This annotation shall only be used on SubmissionSet UpdateAvailabilityStatus Associations. It shall be coded as a Slot with a single value. It carries the expected current value of availabilityStatus of the registry object identified by the targetObject attribute.

4.1.6.4.4.5 Left Blank

Left blank

4.1.6.4.4.6 PreviousVersion

This annotation is constructed as a Slot with name PreviousVersion containing a single value, the previous version number: 1, 2, 3 etc. This annotation is required on the SubmissionSet HasMember Association linked to DocumentEntry or Folder objects in an Update Document Set transaction. The DocumentEntry or Folder object is an update to an existing object and the PreviousVersion value documents the version number of the object being updated. The new version (present in the submission) will get the value PreviousVersion + 1.

Example

```
<Association
  associationType="urn:oasis:names:tc:ebxml-regrep:AssociationType:HasMember"
  sourceObject="SubmissionSet01"
  targetObject="Document01">
    <Slot name="SubmissionSetStatus">
       <ValueList>
          <Value>Original</Value>
       </ValueList>
    </Slot>
    <Slot name="PreviousVersion">
       <ValueList>
          <Value>1</Value>
       </ValueList>
    </Slot>
</Association>
```


The DocumentEntry with id=Document01 (not shown) is an update. The PreviousVersion is 1 so the new version will get a version number of 2.

4.1.6.4.4.7 AssociationPropagation

Example SubmissionSet – DocumentEntry HasMember Association as part of an update including AssociationPropagation annotation

```
<Association
  associationType="urn:oasis:names:tc:ebxml-regrep:AssociationType:HasMember"
  sourceObject="SubmissionSet01"
  targetObject="Document01">
    <Slot name="SubmissionSetStatus">
       <ValueList>
          <Value>Original</Value>
       </ValueList>
    </Slot>
    <Slot name="PreviousVersion">
       <ValueList>
          <Value>1</Value>
       </ValueList>
    </Slot>
    <Slot name="AssociationPropagation">
       <ValueList>
          <Value>no</Value>
       </ValueList>
    </Slot>
</Association>
```

The default behavior for association propagation is defined in section TF-2b: 3.57.4.1.2.2. This example shows the SubmissionSet HasMember association for a new version of a DocumentEntry. The example AssociationPropagation annotation disables association propagation for this object (Document01).

The following additions are made to table 4-1.5 Document Metadata Attribute Definition

documentAvailablity	The status of the Document in the Document Repository. Takes one of two values: urn:ihe:iti:2010:DocumentAvailability:Online or urn:ihe:iti:2010:DocumentAvailability:Offline. If the attribute is not present in metadata its value defaults to Online. This slot, if present, shall have a single value.	O	ebRIM

	Online indicates the Document in the Document Repository is available to be retrieved. Offline indicates the Document in the Document Repository is not available to be retrieved. `<rim:Slot name="documentAvailability">   <rim:ValueList>   <rim:Value> urn:ihe:iti:2010:DocumentAvailability:Offline </rim:Value>   </rim:ValueList> </rim:Slot>`		
logicalID	Logical ID. All versions of a DocumentEntry carry the same logicalID but different and unique entryUUIDs. If not present in a submission, logicalID defaults to the value of the entryUUID attribute. The first version of a DocumentEntry has logicalID equal to entryUUID. Other versions have logicalID not equal to entryUUID. LogicalID shall never be submitted in symbolic form. If it is present in a submission it shall have UUID formatting. Initial version example: `<rim:ExtrinsicObject   id="urn:uuid:3cce0135-cedb-4a26-ba00-8698ee8dde04"> … </rim:ExtrinsicObject>` or `<rim:ExtrinsicObject   id="urn:uuid:3cce0135-cedb-4a26-ba00-8698ee8dde04"   lid="urn:uuid:3cce0135-cedb-4a26-ba00-8698ee8dde04">… </rim:ExtrinsicObject>` One of these two forms shall be submitted in the Registry Document Set transaction. This form, with entryUUID (id) different from logicalID (lid), shall only be submitted in the Update Document Set transaction. `<rim:ExtrinsicObject   id="urn:uuid:3cce0135-cedb-4a26-ba00-8698ee8dde04"   lid="urn:uuid:e0985823-dc50-45a5-a6c8-a11a829893bd">`	O	UUID See section ITI TF-3: 4.1.15

	… </rim:ExtrinsicObject>		
version	Version number of a DocumentEntry. This value is assigned by the Document Registry and shall be ignored if present in a submission. The first version of a DocumentEntry shall have a value of 1. Subsequent versions get values of 2, 3, etc. This attribute shall be returned in query responses. <VersionInfo versionName="2"/>	Cg	ebRIM

2225 *The following additions are made to table 4-1.7 Folder Metadata Attribute Definition*

logicalID	Logical ID. All versions of a Folder carry the same logicalID but different and unique entryUUIDs. If not present in a submission, logicalID defaults to the value of the entryUUID attribute. The first version of a Folder has logicalID (lid) equal to entryUUID (id). Other versions have logicalID not equal to entryUUID. LogicalID shall never be submitted in symbolic form. If it is present in a submission it shall have UUID formatting. Initial version example: <rim:RegistryPackage id="urn:uuid:3cce0135-cedb-4a26-ba00-8698ee8dde04"> … </rim:RegistryPackage> or <rim:RegistryPackage id="urn:uuid:3cce0135-cedb-4a26-ba00-8698ee8dde04"> lid="urn:uuid:3cce0135-cedb-4a26-ba00-8698ee8dde04"> … </rim:RegistryPackage> One of these two forms shall be submitted in the Registry Document Set transaction. This form, with id different from lid, shall only be	O	UUID See section ITI TF-3: 4.1.15

	submitted in the Update Document Set transaction. <rim:RegistryPackage id="urn:uuid:3cce0135-cedb-4a26-ba00-8698ee8dde04" lid="urn:uuid:e0985823-dc50-45a5-a6c8-a11a829893bd"> … </rim:RegistryPackage>		
version	Version number of a Folder. This value is assigned by the Document Registry and shall be ignored if present in a submission. The first version of a Folder shall have a value of 1. Subsequent versions get values of 2, 3, etc. This attribute shall be returned in query responses. <VersionInfo versionName="2"/>	Cg	ebRIM

Vol. 3 Table 4.1-11: Update the Note at the bottom of the table to remove reference to XDS Metadata Update. If this causes the note to not reference any supplement, delete the note.

The following additions are made to table 4.1-11 Error Codes. Note the footnote is new too.

Error Code	Discussion	Transaction **U = Update Document Set** **D = Delete Document Set**
XDSMetadataUpdateError[1]	**General metadata update error. Use only when more specific error code is not available or appropriate.**	**U**
XDSPatientIDReconciliationError[1]	**Update encountered error where Patient IDs did not match**	**U**
XDSMetadataUpdateOperationError[1]	**Document Registry/**	**U**

	Recipient cannot decode the requested metadata update.	
XDSMetadataVersionError[1]	**The version number included in the update request did not match the existing object. One cause of this is multiple simultaneous update attempts.**	**U**
UnresolvedReferenceException[1]	**An entryUUID passed in the Delete Document Set transaction does not exist in the recipient system.**	**D**
ReferencesExistException[1]	**An entryUUID passed in the Delete Document Set transaction is referenced by an Association sourceObject or targetObject attribute.**	**D**

[1] When reporting this error, the codeContext attribute of the RegistryError element shall contain the id attribute of the metadata object causing the error.

Add the following section to volume 3

4.1.15 Metadata Versioning Semantics

One part of metadata updating is the management of metadata versioning as specified in ebRIM 3.0. EbRIM 3.0 version control introduces the following concepts to support versioning:

Metadata Object Instance – a single metadata object representing a single version of an object

Logical Metadata Object – the collection of metadata object instances that are the versions of a single object. Each instance is a different version.

Before the introduction of metadata update into XDS and XDR, a logical metadata object was always represented by a single instance so differentiating logical and instance was not important.

XDS and XDR support the versioning of DocumentEntry and Folder objects. XDS and XDR support the use of the Update Document Set [ITI-57] transaction. XDS supports an extended parameter set to the Registry Stored Query [ITI-18] transaction.

A logical DocumentEntry represents a document in a repository. The logical Document Entry encompasses all the versions (Document Entry instances) that have historically represented the repository document.

An association, through its sourceObject and targetObject attributes, references metadata object instances (particular versions of the objects).

Metadata versions are identified/managed through the use of two metadata attributes: logicalID and version:

logicalID

- Each object instance is assigned a logicalID along with its entryUUID (id in ebRIM terminology)
- The first version of an object has entryUUID equal to logicalID
- Each metadata object instance has a unique value for the entryUUID attribute
- Each logical object has a unique value for the logicalID attribute
- Each logical object is represented by one or more object instances. So, there can be multiple object instances with the same logicalID.
- All objects with the same logicalID shall be of the same type. A logicalID shall identify a group of DocumentEntry objects (a logical DocumentEntry) with the same objectType attribute or a group of Folders (a logical Folder).
- The rules for interpreting logicalID are:
  1. All object instances with the same logicalID are versions of the same logical object
  2. Each object instance has a unique entryUUID
  3. The first version of a logical object has logicalID = entryUUID
  4. The second and later versions of a logical object have logicalID != entryUUID
  5. If an object instance is submitted with no logicalID attribute the value for logicalID defaults to the value of the entryUUID for that object instance (becomes the first version)

version

- Instances of a metadata object are assigned a version through the version attribute as described in ITI TF-3: Table 4-1.5 and 4-1.7.
- The highest numbered version of an object instance shall have availabilityStatus of Approved or Deprecated All older versions shall have availabilityStatus of Deprecated.
- When updates are submitted, they reference the version being updated
- Changes shall only be accepted for the most recent version.

Folder membership propagates to newer versions of a DocumentEntry. The Document Registry or Document Recipient is responsible for the propagation. This responsibility is called Association Propagation. This behavior can be overridden in the update request. See ITI TF-2b: 3.57.4.1.3.4 "Patient ID Reconciliation" for an example.

Document relationships like Addendum and Transformation propagate to newer versions of a DocumentEntry. The Document Registry or Document Recipient may be responsible for the propagation (as defined by Association Propagation). So if a DocumentEntry is linked to another as an Addendum and the metadata is updated then Document Registry or Document Recipient is responsible to make the new version of the DocumentEntry object an Addendum to the same original document. This behavior can be overridden. See Patient ID Reconciliation for an example.

Changes in the availabilityStatus attribute of an object instance do not require the submission of a new instance. Changing any other attribute requires a new object instance (version) be created.

The uniqueID and logicalID attributes of a logical object (and objectType attribute of a DocumentEntry) shall not be altered through versioning. They are required to be consistent across all object instances within a logical object.