

## Integrating the Healthcare Enterprise



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# IHE IT Infrastructure Technical Framework Supplement

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## Document Metadata Subscription (DSUB)

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## Trial Implementation

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

## Foreword

30 This is a supplement to the IHE IT Infrastructure Technical Framework V11.0. Each supplement undergoes a process of public comment and trial implementation before being incorporated into the volumes of the Technical Frameworks.

This supplement is published on August 31, 2015 for trial implementation and may be available for testing at subsequent IHE Connectathons. The supplement may be amended based on the results of testing. Following successful testing it will be incorporated into the IT Infrastructure Technical Framework. Comments are invited and may be submitted at  
35 [http://www.ihe.net/ITI\\_Public\\_Comments](http://www.ihe.net/ITI_Public_Comments).

This document is a new version of DSUB supplement. This new version integrates changes related to:

- a new supplement developed by the ITI Technical Committee with name “Extending DSUB filters and topics”;
- 40 • a new supplement developed by the ITI Technical Committee with name “Pull-Style Notification”;
- updates associated to a series of CPs approved from 2012-2015: CP-610-00, CP-611-01, CP-647-01, CP-615-02, CP-649-03 CP-710-00 CP-728-03 CP-754-02, CP-629-04, CP-699-06, CP-807-01, CP-818-00, CP-837-02, CP-613-09, CP-819-02, CP-831-00, CP-820-05, CP-855-03
- 45

Changes in the new supplements are described in a synthetic way below:

“Extending DSUB filters and topics”:

- Three new use-cases are added to the previous version of the supplement (sections 26.4.4, 26.4.5, and 26.4.6).
- 50 • A new option is defined for the Document Metadata Notification Broker (section 26.2.2).
- Expected Actions for the Subscribe Request Message (transaction [ITI-52]) are changed (section 3.52.4.1.3).
- Two new filter expressions are defined allowing the subscription of folder metadata and submissionSet metadata (section 3.52.5.2).
- 55 • Two new topics are defined allowing the creation of notification payload with Folder metadata or SubmissionSet metadata (sections 3.52.5.1.3, 3.52.5.1.4, and 3.53.4.1.2).

“Pull-Style Notification”:

- Introduces a new modality to convey notification between actors involved.
- 60 • Definition of two new actors: Notification Pull Point and Notification Puller. These actors are grouped with other DSUB actors (respectively Document Metadata Notification Recipient and Document Metadata Subscriber).

- Definition of two new transactions that need to be implemented by the new actors introduced: Pull Notification and Create Destroy Pull Point.
  - Definition of a new use-case: GP’s EHR notification.
- 65
- Removal of the publish and subscribe infrastructure ITI TF-3: 4.4.

This supplement describes changes to the existing technical framework documents.

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

70 *Amend section X.X by the following:*

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

75

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

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

80 Information about the structure of IHE Technical Frameworks and Supplements can be found at: [http://www.ihe.net/IHE\\_Process](http://www.ihe.net/IHE_Process) and <http://www.ihe.net/Profiles>.

The current version of the IHE Technical Framework can be found at: [http://www.ihe.net/Technical\\_Frameworks](http://www.ihe.net/Technical_Frameworks).

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## Introduction to this Supplement

175 The DSUB profiles allows the definition of a system of notification that can involve any kind of application (Laboratory Informative Systems, Local Health Authorities application, GP’s EHR, etc.). Two methods of subscription and notification are defined.

180 1. In the “Push-style” method, a Document Metadata Subscriber may subscribe on behalf of the Document Metadata Notification Recipient to receive notifications about the availability of documents based on specific criteria. A Document Metadata Notification Broker keeps track of the subscriptions and sends the appropriate notifications based on the registration of objects in an XDS Document Registry. Subscriptions exist for a certain period of time and can be cancelled.

185 However, as defined in WS-BaseNotification standard section 5 "Pull-Style Notification", there are certain circumstances in which the basic “push-style” of notification message delivery is not appropriate. For example, certain Document Metadata Notification Recipients are behind a firewall such that the Document Metadata Notification Broker cannot initiate a message exchange to send the notification. A similar circumstance exists for Document Metadata Notification Recipient that is unable or  
190 unwilling to provide an endpoint to which the Notification Broker can send notification messages. In other situations, the Notification Recipient prefers to control the timing of receipt of notification messages, instead of receiving notification messages at unpredictable intervals, it may prefer to “pull” (retrieve) the notification messages at a time of its own choosing.

195 2. In the “Pull-style” method, a Notification Puller creates a Pull Point resource able to store notification generated by the Document Metadata Notification Broker. This Pull Point resource is a resource managed by the Pull Point that allows the storing of notification targeted to a specific recipient. Notifications stored in the Pull Point can be retrieved by the Notification Puller using a specific transaction.

200

## General Introduction

### Appendix A - Actor Summary Definitions

*Add the following actors to the IHE Technical Frameworks General Introduction list of actors:*

205

Actor	Definition
Document Metadata Subscriber	The Document Metadata Subscriber initiates and terminates subscriptions on behalf of a Document Metadata Notification Recipient. Within an XDS Affinity Domain the Document Metadata Subscriber will most likely be grouped with a Document Consumer.
Document Metadata Publisher	The Document Metadata Publisher sends a Document Metadata Publish transaction to the Document Metadata Notification Broker when events occur for which a subscription may exist. Within an XDS Affinity Domain, the Document Metadata Publisher Actor will most likely be grouped with a Document Registry.
Document Metadata Notification Recipient	The Document Metadata Notification Recipient receives the notification about an event, when the subscription filters specified for this Document Metadata Notification Recipient are satisfied. Within an XDS Affinity Domain this actor will likely be grouped with a Document Consumer.
Document Metadata Notification Broker	The Document Metadata Notification Broker is the receiver of the Document Metadata Subscribe transaction containing a subscription request, or a subscription cancellation. It keeps track of all subscriptions in the Metadata Notification domain, including the time limits of subscriptions. Based on the metadata associated with document registrations, this actor sends notifications to interested subscribers. This actor may optionally receive Document Metadata Publish transactions representing the stream of events against which the existing subscriptions are matched. Within an XDS Affinity Domain, the Document Metadata Notification Broker will most likely be grouped with a Document Registry.
Notification Pull Point	The Notification Pull Point is the actor that stores notifications targeted to a specific Document Metadata Notification Recipient that cannot be directly notified. This actor delivers notifications to the Notification Puller when requested.
Notification Puller	The Notification Puller is the actor that can create a pull point resource for the storing of notifications. It pulls notifications stored in a Notification Pull Point when requested.

### Appendix B - Transaction Summary Definitions

*Add the following transactions to the IHE Technical Frameworks General Introduction list of Transactions:*

210



## IHE IT Infrastructure Technical Framework Supplement – Document Metadata Subscription (DSUB)

Transaction	Definition
ITI- 52 Document Metadata Subscribe	This transaction is sent by the Document Metadata Subscriber to the Document Metadata Notification Broker in order to start a subscription for a particular set of topics, indicating possible start and end time for the subscription. Subscriptions cannot be modified. Any Document Metadata Subscriber can cancel a subscription, as long as it has the subscription id. The subscription request shall specify whether a document full notification, a document minimal notification, a folder metadata notification, or a submissionSet metadata notification will be sent when there is a match to the subscription's filter.
ITI-53 Document Metadata Notify	This is a transaction from the Document Metadata Notification Broker to the Document Metadata Notification Recipients, sending a notification about the availability of a document or documents of interest, based on the subscribers' filters on selected topics.
ITI-54 Document Metadata Publish	This transaction is sent from the Document Metadata Publisher to the Document Metadata Notification Broker when an event occurs for which there may be a subscription.
ITI-69 Create Destroy Pull Point	This transaction is used to create a pull point resource. This resource is used for the creation of subscriptions and for the pulling of the notifications stored. This transaction is also used to destroy the pull point resource when it is no longer needed.
ITI-70 Pull Notification	This transaction is used to retrieve pending notifications.

### Glossary

215

*Add the following glossary terms to the IHE Technical Frameworks General Introduction Glossary:*

Glossary Term	Definition
Notification Broker	A system or a module in a publish/subscribe framework, the purpose of which is to process subscription/un-subscription requests, to keep track of existing subscriptions, to receive publish information, and based on the set of filters for each subscription, to send a notification about the published information to the appropriate notification recipients.
Publisher	A system or a module in a publish/subscribe framework, the purpose of which is to publish information to the notification broker about events for which there may be existing subscriptions.
Subscriber	A system or a module in a publish/subscribe framework, the purpose of which is to send subscribe and unsubscribe requests to the notification broker on the behalf of a notification recipient. The subscribe request contains a set of filters to determine the information for which the subscription applies.
Notification Recipient	A system or a module in a publish/subscribe framework, the purpose of which is to receive and process notifications from the notification broker.
Pull Point resource	A resource managed by the Pull Point that allows the storing of notification targeted to a specific recipient.

# Volume 1 – Integration Profiles

## 1.7 History of Annual Changes

220

*Add the following bullet to the end of the bullet list in Section 1.7*

- Added the Document Metadata Subscription Profile which describes the use of subscription and notification mechanism within an XDS Affinity Domain and across communities.

## 2.1 Dependencies among Integration Profiles

225

*Add the following to Table 2-1*

DSUB	Audit Trail and Node Authentication	Each DSUB actor shall be grouped with Secure Node or Secure Application Actor	- Required to manage audit trail of exported PHI, node authentication and transport security.
DSUB	Consistent Time	Each DSUB actor shall be grouped with the Time Client Actor	- Required due to ATNA grouping.

*Add the following section to Section 2.2*

### 2.2.26 Document Metadata Subscription Integration Profile

230

This profile describes the use of subscription and notification mechanism for use within an XDS Affinity Domain and across communities. The subscription allows for the matching of metadata during the publication of a new document for a given patient, and results in the delivery of a notification.

235

*Add Section 26*

### 26 Document Metadata Subscription Integration Profile

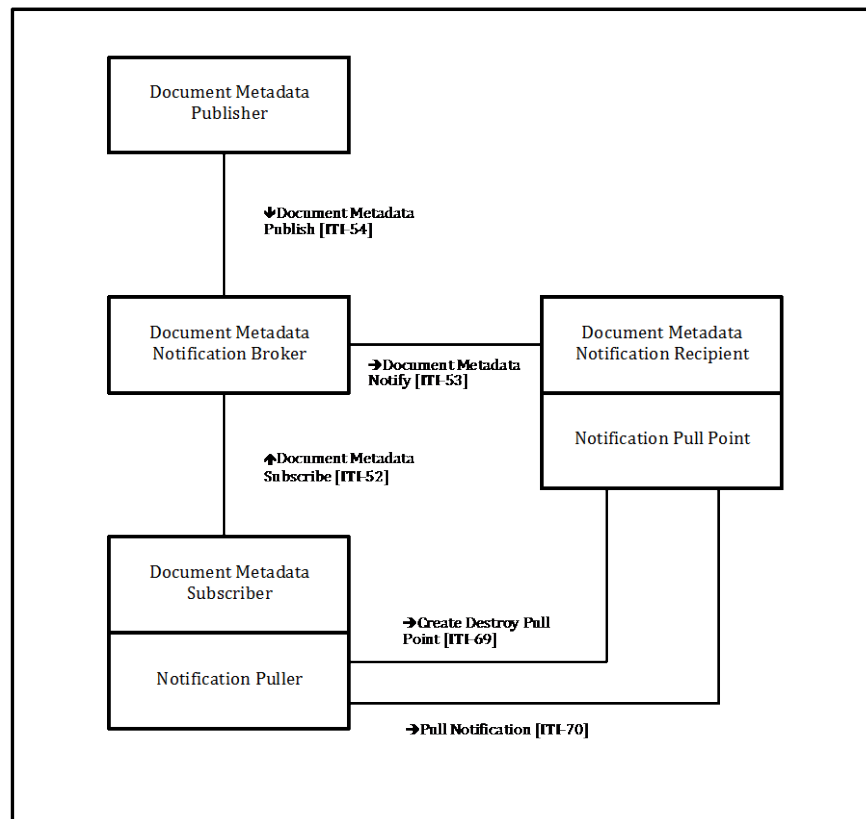
240

This profile describes the use of subscription and notification mechanism for use within an XDS Affinity Domain and across communities. The subscription allows for the matching of metadata during the publication of a new document for a given patient, and results in the delivery of a notification. This profile is based on the OASIS WS-BaseNotification standard and, in accordance to that, defines two methods of subscription and notification:

- 245
1. In the “Push-style” method, a Document Metadata Subscriber may subscribe on behalf of the Document Metadata Notification Recipient to receive notifications about the availability of documents based on specific criteria. A Document Metadata Notification Broker keeps track of the subscriptions and sends the appropriate notifications based on the registration of objects in an XDS Document Registry. Subscriptions exist for a certain period of time and can be cancelled.
  2. In the “Pull-style” method, a Notification Puller creates a Pull Point resource able to store notification generated by the Document Metadata Notification Broker. This Pull Point resource is a resource managed by the Pull Point that allows the storing of notification targeted to a specific recipient. Notifications stored in the Pull Point can be retrieved by the Notification Puller using a specific transaction.
- 250

## 26.1 DSUB Actors and Transactions

255 Figure 26.1-1 shows the actors directly involved in the Document Metadata Subscription Integration Profile and the relevant transactions between them. Other actors that may be indirectly involved due to their participation in the XDS Integration Profile, etc. are not necessarily shown.



260 **Figure 26.1-1: Document Metadata Subscription Actor Diagram**

265 Table 26.1-1 lists the transactions for each actor directly involved in the Document Metadata Subscription Profile. In order to claim support of this Integration Profile, an implementation must perform the required transactions (labeled “R”). Transactions labeled “O” are optional. A complete list of options defined by this Integration Profile and that implementations may choose to support is listed in Section 26.2.

**Table 26.1-1: Document Metadata Subscription Integration Profile - Actors and Transactions**

Actors	Transactions	Optionality	Reference
Document Metadata Notification Broker	Document Metadata Subscribe	R	ITI TF-2b:3.52
	Document Metadata Notify	R	ITI TF-2b:3.53
	Document Metadata Publish	O	ITI TF-2b:3.54
Document Metadata Subscriber	Document Metadata Subscribe	R	ITI TF-2b:3.52
Document Metadata Publisher	Document Metadata Publish	R	ITI TF-2b:3.54
Document Metadata Notification Recipient	Document Metadata Notify	R	ITI TF-2b:3.53
Notification Puller	Pull Notification	R	ITI TF-2c:3.70
	Create Destroy Pull Point	O	ITI TF-2c:3.69
Notification Pull Point	Pull Notification	R	ITI TF-2c:3.70
	Create Destroy Pull Point	O	ITI TF-2c:3.69

270 **26.1.1 Actor Descriptions and Actor Profile Requirements**

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

**26.1.1.1 Document Metadata Notification Broker**

275 The Document Metadata Notification Broker is the receiver of the Document Metadata Subscribe transaction containing a subscription request, or a subscription cancellation. It keeps track of all subscriptions it receives, including the time limits of subscriptions. Based on the metadata associated with document registrations, this actor sends notifications to interested subscribers. This actor may optionally receive Document Metadata Publish transactions representing the stream of events against which the existing subscriptions are matched.

280 **26.1.1.2 Document Metadata Subscriber**

The Document Metadata Subscriber initiates and terminates subscriptions on behalf of a Document Metadata Notification Recipient.

**26.1.1.3 Document Metadata Publisher**

285 The Document Metadata Publisher sends a Document Metadata Publish transaction to the Document Metadata Notification Broker when an event occurs for which a subscription may exist. This profile does not specify how the Document Metadata Publisher becomes aware of those events.

**26.1.1.4 Document Metadata Notification Recipient**

290 The Document Metadata Notification Recipient receives the notification about an event, when the subscription filters specified for this Document Metadata Notification Recipient are satisfied.

**26.1.1.5 Notification Puller**

The Notification Puller is the actor that is involved in a notification system using a pull-style approach. This actor “activates” the Notification Pull Point using the Create Destroy Pull Point transaction [ITI-69] to create (and destroy) the Pull Point resource.

295 The Notification Puller SHALL be grouped with a Document Metadata Subscriber.

When using the “pull-style” method of notification, the order of the transactions SHALL be:

1. The Notification Puller (grouped with a Document Metadata Subscriber) sends the Create Destroy Pull Point transaction [ITI-69]. In response the Notification Pull Point (grouped with the Document Metadata Notification Recipient) returns the endpoint of the Pull Point resource. The Notification Puller/Document Metadata Subscriber now knows from  
300 where to “pull” notifications.
2. The Document Metadata Subscriber/Notification Puller sends the Document Metadata Subscribe [ITI-52] transaction to the Document Metadata Notification Broker, identifying  
305 the endpoint where the notification is to be sent (the Notification Pull Point/Document Metadata Notification Recipient).
3. Over time, the Notification Pull Point/Document Metadata Notification Recipient will receive notifications via Document Metadata Notify [ITI-53].
4. Later, the Notification Puller sends the Notification Pull transaction [ITI-70] to the  
310 Notification Pull Point/Document Metadata Notification Recipient to retrieve notifications it subscribed to.

The order of the transaction for the destroy of the Pull Point resource SHALL be:

1. The Notification Puller (grouped with a Document Metadata Subscriber) sends unsubscribe Requests (Document Metadata Subscribe [ITI-52] transaction) to delete all

315 subscriptions created using the endpoint of the Pull Point resource that needs to be destroyed.

2. The Notification Puller can proceed with the destroying of the Pull Point resource using Create Destroy Pull Point transaction [ITI-69].

If the Notification Puller does not support the optional Create Destroy Pull Point [ITI-69] transaction, it SHALL be able to support the following configuration requirements:

- 320
- It SHALL be configurable with the endpoints for the Pull Point resources already created for it.
  - It SHALL configure the endpoint for Notification Pull transaction.

#### **26.1.1.6 Notification Pull Point**

325 The Notification Pull Point is the actor that stores notifications targeted to systems which cannot be directly notified. The intended recipient for the notifications received by the Notification Pull Point is the Notification Puller that creates a Pull Point resource using the Create Destroy Pull Point transaction. A Pull Point resource is created in response to each Create Pull Point request (it is possible to have many Pull Point resources for the same Notification Puller) and is used to collect all notifications destined for the requesting Notification Puller.

330 The Notification Pull Point can manage Pull Point resources created by many different Notification Puller actors.

The Notification Pull Point SHALL be grouped with a Document Metadata Notification Recipient in order to receive notifications from a Document Metadata Notification Broker.

In order to not lose nor duplicate notifications:

- 335
- After the creation of a Pull Point resource, the Notification Pull Point receives and stores all notifications in the target Pull Point resource. The Notification Puller can then retrieve the notifications stored in a target Pull Point resource.
  - Notifications returned to the Notification Puller are deleted from the Pull Point resource in accordance to the WS-BaseNotification standard.

340 If the Notification Pull Point does not support the optional Create Destroy Pull Point [ITI-69] transaction, it SHALL be able to support the following configuration requirements:

- At least one Pull Point resource needs to be pre-created for each Notification Puller involved in the notification system.
  - The endpoints of these Pull Point resources need to be disclosed to the correct
- 345 Notification Puller.

## 26.2 DSUB Actor Options

Options that may be selected for this Integration Profile are listed in the Table 26.2-1 along with the actors to which they apply. Dependencies between options when applicable are specified in notes.

350

**Table 26.2-1: Document Metadata Subscription - Actors and Options**

Actor	Option Name	Reference
Document Metadata Notification Broker	Document Metadata Publish Recipient	ITI TF-1: 26.2.1
	Folder Subscription	ITI TF-1: 26.2.2
	Patient-Independent Subscription Option	ITI TF-1: 26.2.3
Document Metadata Subscriber	Patient-Independent Subscription Option	ITI TF-1: 26.2.3
Document Metadata Publisher	<i>No options defined</i>	--
Document Metadata Notification Recipient	<i>No options defined</i>	--

### 26.2.1 Document Metadata Publish Recipient Option

355 The Document Metadata Notification Broker that supports this option shall accept and process Document Metadata Publish transactions.

### 26.2.2 Folder Subscription Option

360 The Document Metadata Notification Broker that supports this option shall accept and process subscriptions that use Folder metadata as filter parameters and shall be able to send notifications when the content of the folder changes. A notification is sent if a new document is added to an existing folder or if a document in an existing folder is replaced. Refer to ITI TF-2b:3.52.4.1.3.1 and 3.52.5.2.2 and 3.53.4.1.2 for details. It is likely that the Document Metadata Notification Broker will maintain status of existing folders rather than making GetFolders queries [ITI-18] to determine folder status.

### 26.2.3 Patient-Independent Subscription Option

365 A Patient-Independent Subscription does not specify a patientId parameter. This type of subscription may be applied to DocumentEntry objects or SubmissionSets.

A Document Metadata Subscriber that supports this option shall be able to create patient-independent subscription filters.

370 A Document Metadata Notification Broker that supports this option shall be able to accept patient-independent subscriptions.

See ITI TF-2b:3.52.5.2.4 and ITI TF-2b:3.52.5.2.5 for use cases related to patient-independent subscriptions.

### 26.3 DSUB Required Actor Groupings

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

**Table 26.3-1: DSUB - Required Actor Groupings**

DSUB Actor	Profile/Actor to be grouped with	Reference
Document Metadata Notification Broker	ATNA / Secure Node or Secure Application	ITI TF-1:9.4
	CT / Time Client	ITI TF-1:7.1
Document Metadata Subscriber	ATNA / Secure Node or Secure Application	ITI TF-1:9.4
	CT / Time Client	ITI TF-1:7.1
Document Metadata Publisher	ATNA / Secure Node or Secure Application	ITI TF-1:9.4
	CT / Time Client	ITI TF-1:7.1
Document Metadata Notification Recipient	ATNA / Secure Node or Secure Application	ITI TF-1:9.4
	CT / Time Client	ITI TF-1:7.1
Notification Pull Point	DSUB / Document Metadata Notification Recipient	ITI TF-1:26.1
Notification Puller	DSUB / Document Metadata Subscriber	ITI TF-1:26.1

### 26.4 DSUB Overview

#### 380 26.4.1 Concepts

This profile describes the use of subscription and notification mechanisms for use within an XDS Affinity Domain and across communities. The subscription allows for the matching of metadata during the publication of a new document for a given patient, and results in the delivery of a notification.

385 If a system can implement the Document Metadata Notification Recipient, it can be directly notified using a push-style method.

In other scenarios, a system that cannot be notified using the push-style delivery approach implements the pull-style approach because, for example,



- a system that receives notifications is behind a firewall
- 390 • a system is unable or unwilling to provide an endpoint to which the Document Metadata Notification Broker can send notifications.
- a system doesn't want to be notified at unpredictable times but rather at a time of its own choosing.

The use-cases below describe both of these scenarios.

## 395 **26.4.2 Use Cases**

### **26.4.2.1 Use Case #1: Unexpected Notification**

#### **26.4.2.1.1 Unexpected Notification Use Case Description**

400 A patient in the emergency department has all her relevant available documents retrieved via XDS transactions. As initial triage of the patient is done, an additional document regarding diagnostic results for this patient is registered in the XDS Document Registry. Currently, there is no way for the Emergency department to learn about the existence of this new information. With a publish/subscribe infrastructure, the initial query to the XDS Document Registry would be accompanied with a subscription request, as a result of which a notification would be sent to the emergency department. The subscription will be terminated once the patient is no longer under  
405 the care of the emergency department's institution.

### 26.4.2.1.2 Unexpected Notification Process Flow

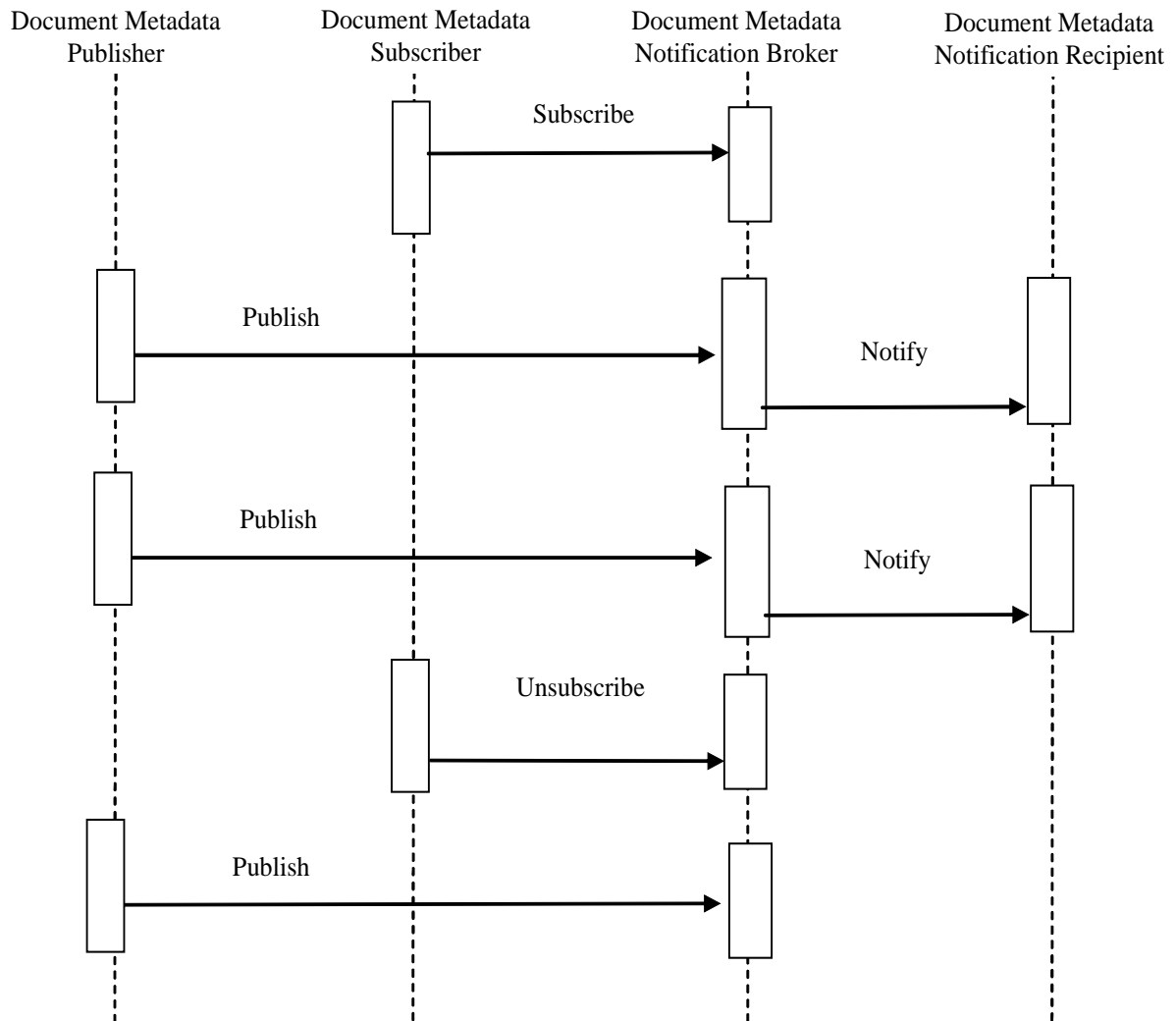


Figure 26.4.2.1.2-1: Interaction Diagram for Unexpected Notification Use Case

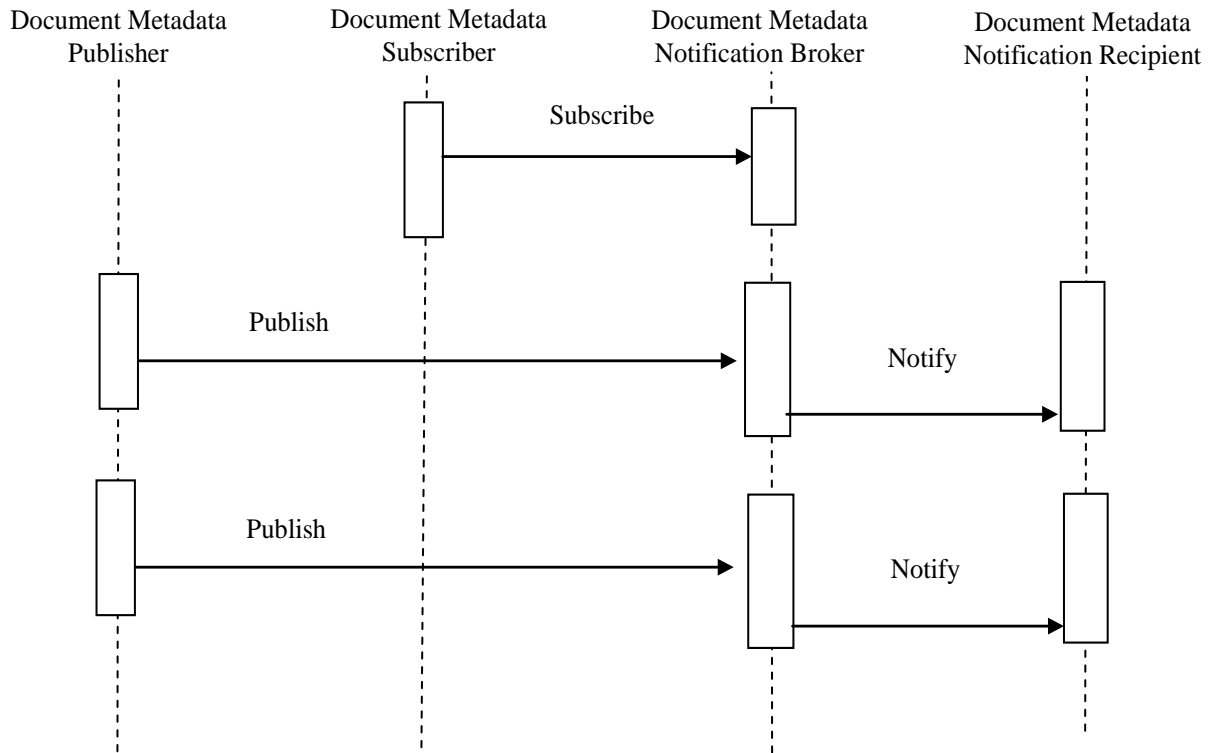
## 410 26.4.2.2 Use Case #2: Long-term Subscription

### 26.4.2.2.1 Long-term Subscription Use Case Description

A patient visits his PCP after being discharged from a hospital that belongs to the same XDS Affinity Domain as the provider's organization. The provider sends a query to the XDS Document Registry, and retrieves the hospital discharge summary. The patient also has follow-

415 up visits with a specialist at the hospital, and these visit summaries (including diagnostic test  
 results) are registered in the XDS Document Registry. Currently, the PCP would have to  
 periodically query the Document Registry for documents about the patient in order to retrieve the  
 follow-up visit summaries. With a publish/subscribe infrastructure, the PCP would have a  
 420 subscription for all his patients, so that notifications would have been received as the summaries  
 were registered in the XDS Document Registry.

**26.4.2.2.2 Long-term Subscription Process Flow**



**Figure 26.4.2.2.2-1: Interaction Diagram for Long-term Subscription Use Case**

425 **26.4.2.3 Use Case #3: Antepartum Record Availability**

**26.4.2.3.1 Long-term Subscription Use Case Description**

From the set of Antepartum Record profiles in the PCC domain:

During the 40 weeks of a typical pregnancy duration, the patient will have an initial History and Physical Examination, followed by repetitive office visits with multiple laboratory studies, imaging (usually ultrasound) studies, and serial physical examinations with recordings of vital signs, fundal height, and the fetal heart rate. As the patient is seen over a finite period in the

office, aggregation of specific relevant data important to the evaluation of the obstetric patient upon presentation to Labor and Delivery is captured on paper forms. The antepartum documents contain the most critical information needed including the ongoing Medical Diagnoses, the Estimated Due Date, outcomes of any prior pregnancies, serial visit data on the appropriate growth of the uterus and assessments of fetal well-being, authorizations, laboratory and imaging studies. This data must all be presented and evaluated upon entry to the Labor and Delivery Suite to ensure optimal care for the patient and the fetus.

430 The ability of the PCC Content Consumer to establish a subscription for the updates to the antepartum documents for a given expectant mother will enhance the ability to automate the delivery of the information in a timely manner.

### 26.4.2.3.2 Long-term Subscription Use Case Process Flow

The following diagram illustrates the process flow within an XDS Affinity Domain reflecting the use case presented in Section 26.4.2.3.1:

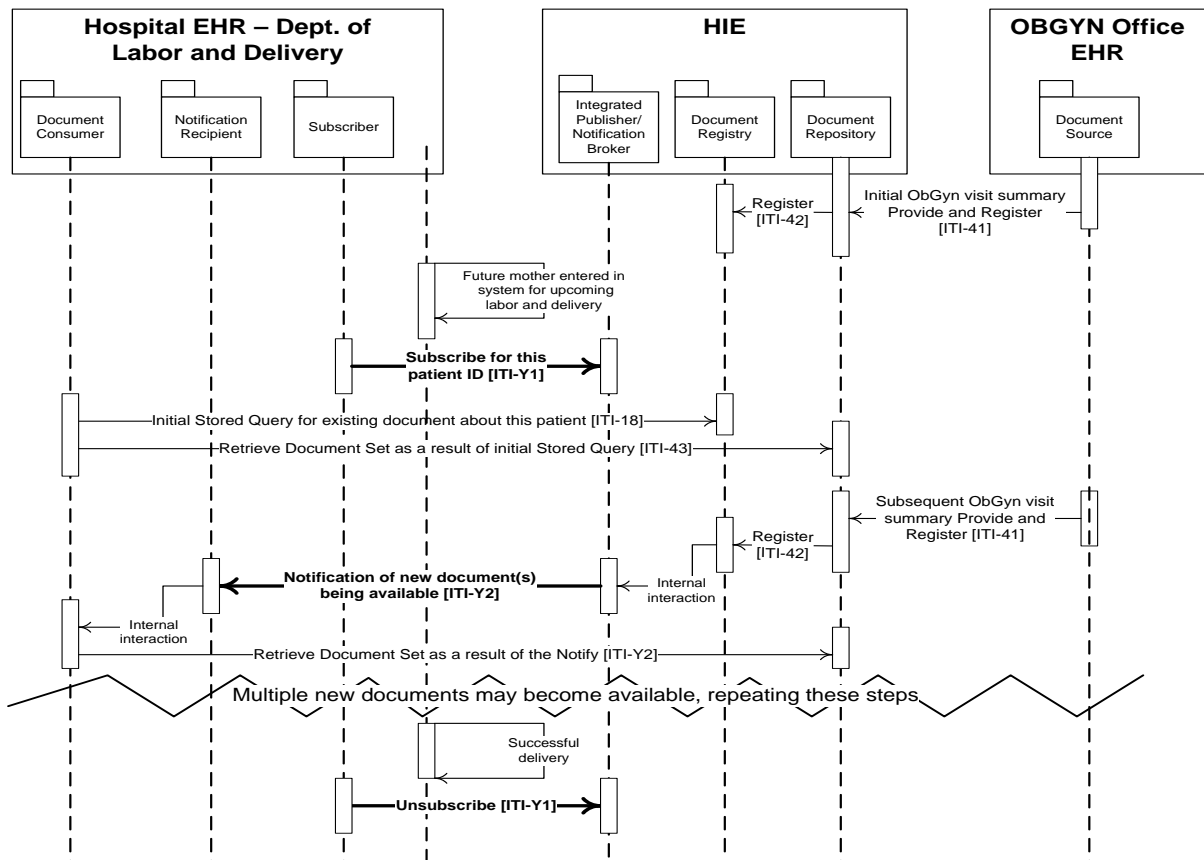


Figure 26.4.2.3.2-1: Interaction diagram for Long-term Subscription Use Case

435

440 The above interaction diagram is showing a grouping of a Document Consumer, a Document Metadata Notification Recipient, and a Document Metadata Subscriber on one side, and a grouping of a Document Registry, a Document Repository and an Integrated Document Metadata Publisher/Notification Broker on the other side. The emphasized transactions are described in this profile, while the interactions with the grouped XDS actors are also shown. Note that the grouping presented here is not required.

#### **26.4.2.4 Use Case #4: Targeted Document Publication**

445 In this use case, a system desires to subscribe to a submissionSet with a specific intended recipient of clinical information. A source of clinical content can identify the intended target for a submissionSet using the XDSSubmissionSet.IntendedRecipient metadata attribute.

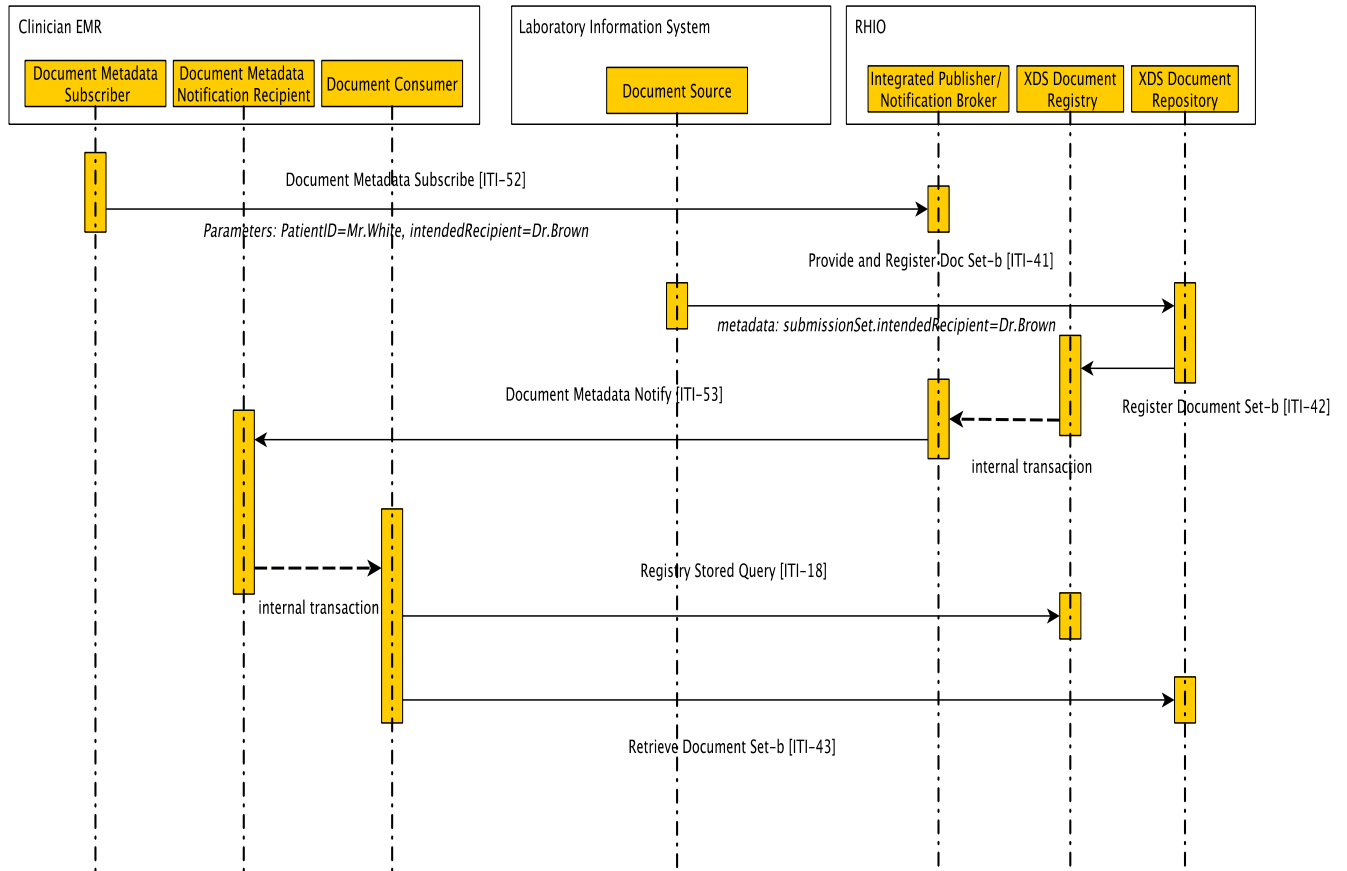
##### **26.4.2.4.1 Targeted Document Publication Use Case Description**

450 Dr. Brown is a clinician and can request exams for many patients. His system can create a subscriptions for documents produced that are intended for him (the subscription created has the intendedRecipient as filter parameter).

Mr. White attends a consultation with Dr. Brown, who requests a Laboratory Report for the patient. The EMR system creates a subscription with an intendedRecipient of Dr. Brown.

455 The patient receives the exam in a Clinical Laboratory. The Laboratory Information System produces a report and submits the document in the Document Sharing Infrastructure identifying Dr. Brown as intendedRecipient for the submission. This publishing event matches the existing subscription and a notification is sent by the Document Metadata Notification Broker to Dr. Brown's system (identified as Document Metadata Notification Recipient in the subscription created).  
460 Dr. Brown can quickly analyze the report published and can make other clinical decisions in an efficient way.

### 26.4.2.4.2 Targeted Document Publication Process Flow



465

**Figure 26.4.2.4.2-1: Interaction Diagram for IntendedRecipient subscription**

### 26.4.2.5 Use Case #5: Folder subscription

This use case recognizes that it is often not possible to identify in advance the type of document that will be produced during a clinical event, so a subscription using the findDocuments filter expression is useless. In many cases it is only possible to identify the specific clinical event of interest (e.g., Hospitalization, Clinical Day Service, etc.).

470

#### 26.4.2.5.1 Folder subscription Use Case Description

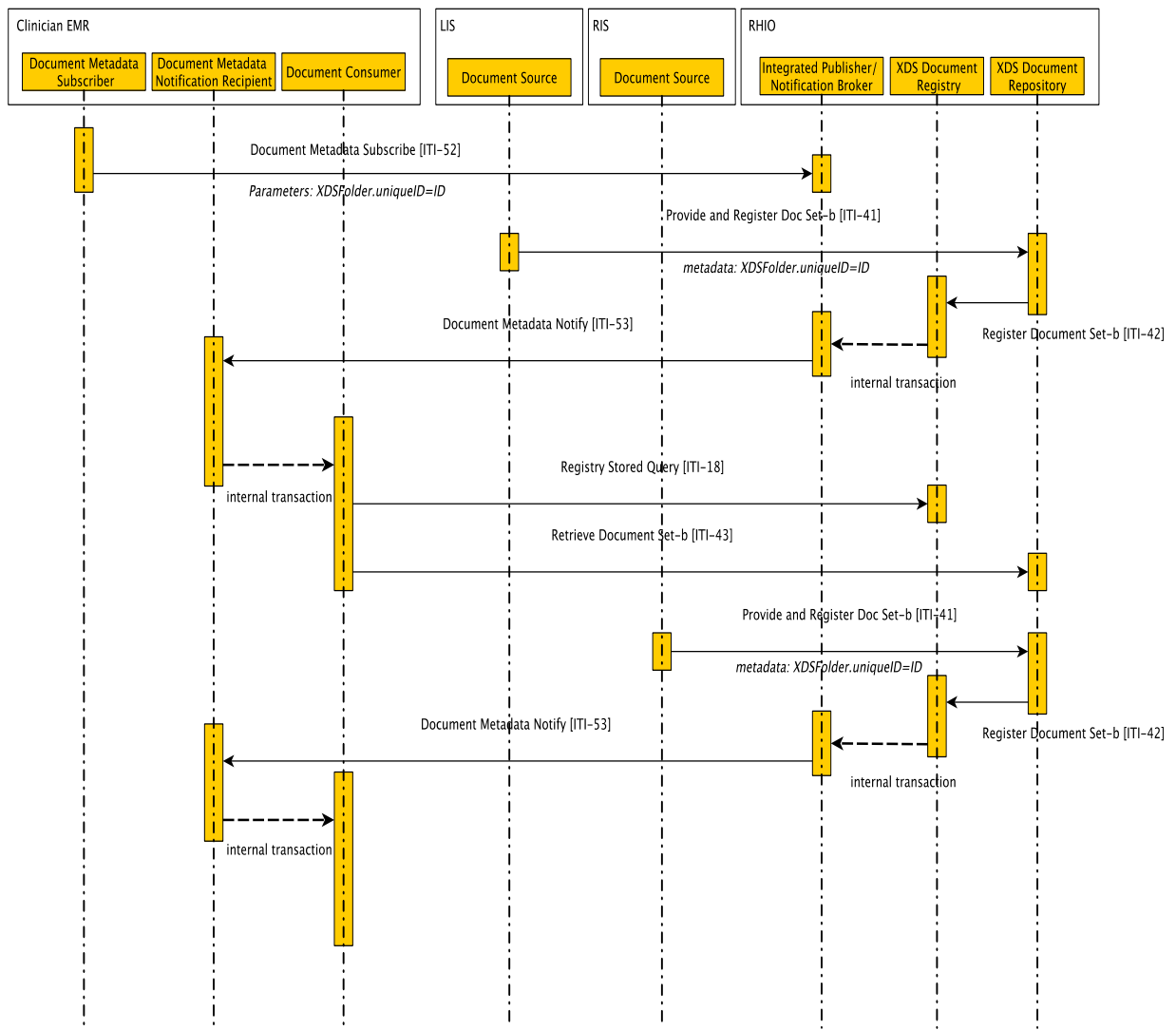
Mr. White is admitted in hospital for a complex diagnostic study pathway. Dr. Brown is the clinician responsible for the “Day Service” of this patient. Any document produced by LIS, RIS, and ward Informative Systems should be collected in a Folder object used for keeping and for

475

managing the evolution of the clinical pathway. Dr. Brown wants to be notified of any content published in this folder. The Dr. Brown’s system can create a subscription selecting as filter parameter the XDSFolder.uniqueId of the folder just created.

480 During the “Day Service”, a Laboratory Report and a Radiology Report are produced. Both the documents are submitted into the folder created for the clinical event. Each publishing event results in a match with the subscription created by Dr. Brown’s system. The Document Metadata Notification Broker creates two notifications and they are sent to the Document Metadata Notification Recipient referenced in the subscription (i.e., Dr. Brown’s system). The Dr. Brown is kept up to date during the clinical processes.

485 **26.4.2.5.2. Folder subscription Process Flow**



**Figure 26.4.2.5.2-1: Interaction Diagram for Folder subscription Use Case**

### 26.4.2.6 Use Case #6: Workflow Id subscription

490 In this use case a clinician creates a subscription for a specific instance of workflow (e.g., eReferral Workflow) because he wants to be notified of any updates that occurred to the workflow. The workflow Id is stored in the metadata XSDDocumentEntry.ReferenceIdList.

#### 26.4.2.6.1 Workflow Id subscription Use Case Description

495 Dr. Brown is a GP. He decides to refer his patient Mr. White to another healthcare provider to have a specialist's consultation. Dr. Brown does not take part in subsequent steps of the Referral process, but he wants to be notified of any relevant progress related to the workflow. Mr. White calls the specialist, Dr. Green, to schedule the specialist consultation. Dr. Brown is notified of this event.

500 On the day of the visit, the patient is admitted in Dr. Green's office. Dr. Green analyzes the referral request created by Dr. White and any useful Clinical Documents related to the request. When the visit is completed, Dr. Green publishes a report and Dr. Brown is notified of the completion of the eReferral process so that he can analyze the whole workflow and all related documents.

##### 26.4.2.6.1.1 Technical Aspects (Workflow Id and XSDDocumentEntry ReferenceIdList subscription)

505 The eReferral process is managed and tracked by the creation of a specific Workflow Document (e.g., as defined in the IHE PCC Cross-enterprise Basic eReferral Workflow Definition Profile (XBeR-WD)). The Workflow Document has a unique fixed reference, the workflow Id, which is stored in the XSDDocumentEntry.ReferenceIdList metadata.

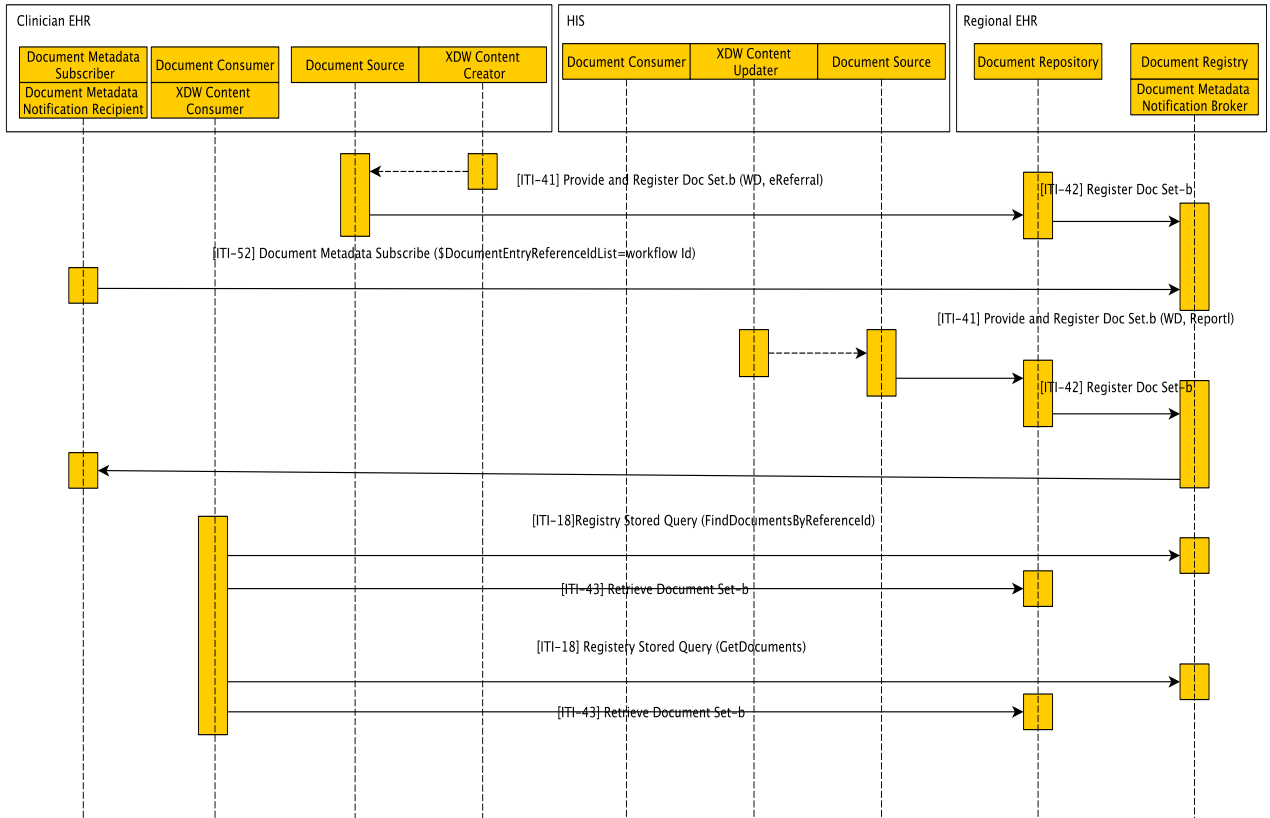
510 The GP's system creates this Workflow Document and a related subscription that identifies the specific workflow Id as filter parameter for the creation of notifications. From this time, any update of the workflow document will result in the creation and the delivery of a notification to the GP, because the Workflow Id remains the same during the whole evolution of the workflow. For example, the scheduling phase involves the creation of a new version of the Workflow Document characterized by the same workflow Id. This scheduling event triggers the creation of  
515 a notification that is sent to the GP.

The execution of the visit involves another update of the workflow document and, as consequence, a new notification is sent to the GP.

This notification framework allows the GP to be active participant in the process started by him.



26.4.2.6.2 Workflow Id subscription Process Flow



520

Figure 26.4.2.6.2-1: Interaction Diagram for Workflow Id subscription Use Case

26.4.2.7 Use Case #7: GP’s EHR notification

525 This use-case describes the scenario in which a General Practitioner (GP) would like to be notified for hospitalizations of patients assisted, even though the GP’s EHR system is on-line only for a restricted time interval.

26.4.2.7.1 GP’s EHR notification Use Case Description

530 Dr. Brown is a GP. He assists many patients and he is very interested in receiving notifications of their eventual hospitalization. This ready acknowledgment and the direct communication between the GP and the hospital can be fundamental for granting a complete and secure clinical approach in solving the health problems of the patient.

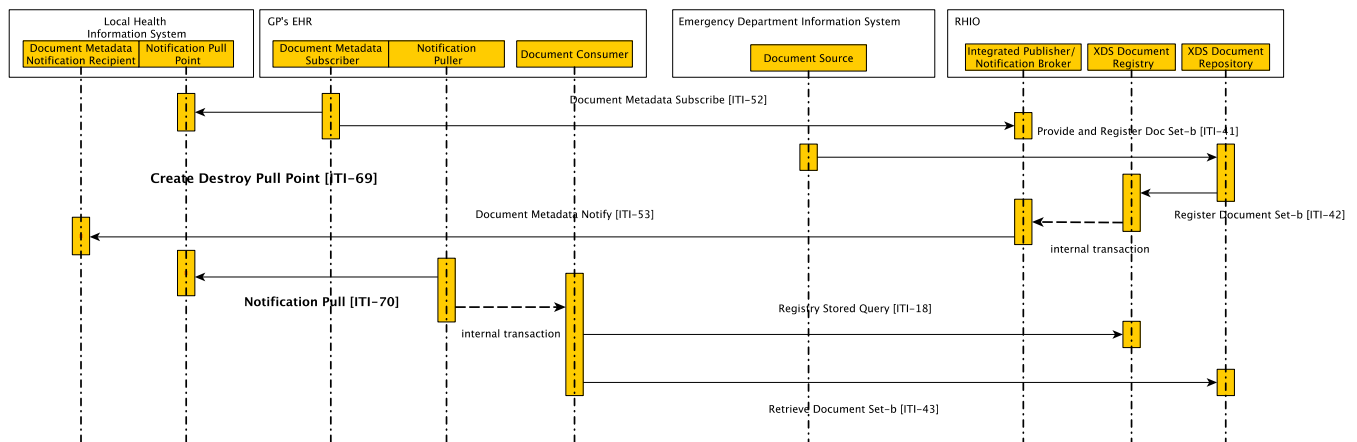
535 The GP’s EHR is not on-line when a clinical event occurs such as a hospitalization. When a pull-style EHR goes on-line it can immediately retrieve outstanding notifications. When a push-style EHR goes on-line it must wait until the Document Metadata Notification Broker retries a push. This retry might not be in time before the EHR goes off-line again.

In this use-case the GP’s EHR creates a Pull Point resource able to store notifications on behalf of his EHR. The EHR receives in the Response message the endpoint of the pull point resource just created. The EHR system can use this endpoint for any of the supported subscription.

540 Mr. White is one of the Dr. Brown patients. During the night he becomes sick and he is hospitalized. A diagnosis for the admission of the patient is formulated, and a document is created by the Emergency Department Information System and registered in XDS Document Registry. The Document Metadata Notification Broker discovers a match with a subscription created by the Dr. Brown’s EHR, and sends a notification to the Document Metadata Notification Recipient grouped with the Notification Pull Point referenced in the subscription.

545 The Notification Pull Point stores this and other notifications. The next morning Dr. Brown’s EHR pulls all pending notifications. The EHR receives the notification that was created after the publication of the Admission Document. Dr. Brown reads the Admission Document and analyzes notes gathered during the last weeks and discovers some symptoms or findings that can be useful for focusing the diagnostic and therapeutic phases during the current hospitalization.

550 **26.4.2.7.2 GP’s EHR notification Process Flow**



**Figure 26.4.2.7.2-1: Sequence Diagram for GP’s EHR notification**

555 The Document Metadata Subscriber that is grouped with the Notification Puller creates the pull point resource by the Create Destroy Pull Point transaction [ITI-69]. The response message of this transaction contains the endpoint of the Document Metadata Notification Recipient grouped with the Notification Pull Point.

560 The Document Metadata Subscriber creates a subscription for a specific patient with the Document Metadata Subscribe transaction [ITI-52] identifying the Document Metadata Notification Recipient/Notification Pull Point as target for notifications created

A document published in the XDS environment (using the transactions Provide and Register Document Set-b [ITI-41] and Register Document Set-b [ITI-42]) matches with a subscription already created. The Document Metadata Notification Broker creates and sends a notification to

565 the Document Metadata Notification Recipient/Notification Pull Point using the Document Metadata Notify transaction [ITI-53]

Without any specific trigger event, the Notification Puller can pull notifications stored in the Notification Pull Point using a Pull Notification transaction [ITI-70].

The notification payload might then be used for querying and retrieving documents using the XDS transactions Register Stored Query [ITI-18] and Retrieve Document Set-b [ITI-43].

#### 570 **26.4.2.8 Use Case #8: Patient-independent tele-consultant notification**

In this use case, a system used to provide tele-consulting services would be notified about Consult Requests published by Consult Requester systems. It is not possible to know in advance the patient for whom the consulting process is started and there are many Consultants that can participate in the workflow. The consulting system can create just one patient-independent subscription for Consult Request documents.

##### **26.4.2.8.1 Patient-independent tele-consultant scenario**

Dr. Green is the clinician in charge of the consulting process. Dr. Green submits a subscription for documents with a document type of "Consult Request".

580 Dr. Brown is a Clinician who works for the Hope Clinic, a regional hospital specializing in neurological surgery treatment. This hospital and some other clinics provide tele-consulting services to many local hospitals.

585 Mr. White, after a car accident, is admitted to the Emergency Department in a local hospital. This hospital is not equipped with a Neurological ward so the ER physician, Dr. Young, decides to ask for a consult by a specialist. Using a Consult Requester system, Dr. Young publishes a Consult Request, looking for an available Consultant. This is done by publishing a Subscription for Consult Request document with a subscription expiration time that covers the whole work shift of the clinician and that has a "Consult Request" documentType.

When Dr. Young's Consult Request is published, the Notification Broker identifies a match with a patient-independent subscription and sends a notification to Dr. Green.

590

### 26.4.2.8.2 Tele-Consultant patient-independent notification Process Flow

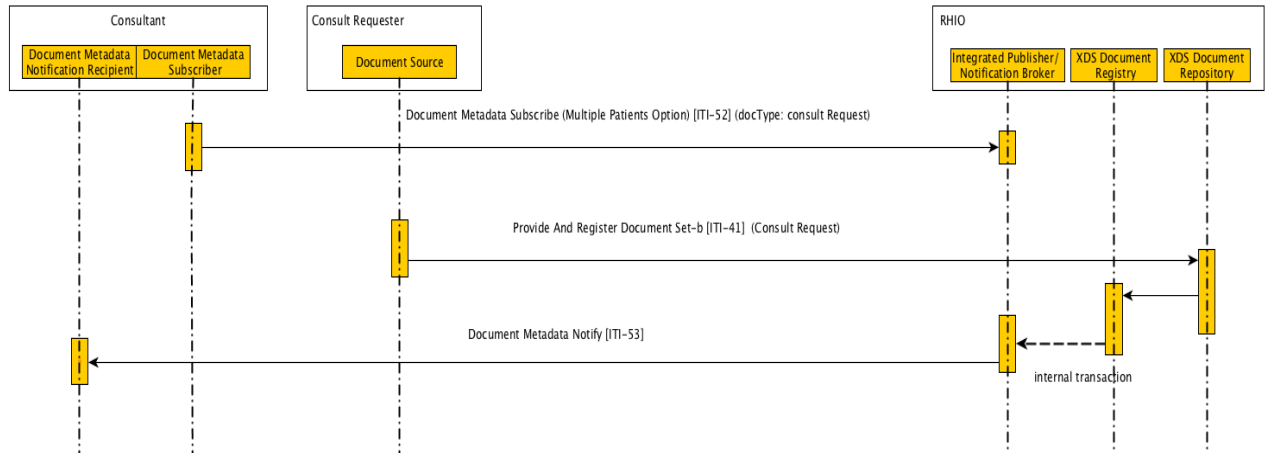


Figure 26.4.2.8.2-1: Interaction Diagram for patient-independent subscription

## 595 26.5 DSUB Security Considerations

The risk analysis for this profile enumerates assets, threats, and mitigations. The risk assessment spreadsheet is stored and available from IHE at [http://wiki.ihe.net/images/4/46/DSUB\\_risk\\_assesment.xls](http://wiki.ihe.net/images/4/46/DSUB_risk_assesment.xls).

600 The purpose of this risk assessment is to notify implementers of some of the risks that they need to consider in implementing DSUB actors. For general IHE risks and threats please see ITI TF-1: Appendix L. The implementers are also advised that many risks cannot be mitigated by the IHE profile and instead the responsibility for mitigation is transferred to the implementer, and occasionally to the XDS Affinity Domain and enterprises. In these instances, IHE's responsibility to notify affected parties is fulfilled through the following section.

605 A policy decision can be made during the Subscribe transaction, whether the subscription is an authorized subscription and whether a notification/type of notification is authorized. (This could be based on the XUA identity, the consumer address value, etc.)

This profile does not include the solution to changes of policy between the subscribe time and notify time (which can be substantial). The recommendation is that the policy is enforced conservatively (i.e., the length of subscription can be determined by the Document Metadata Notification Broker). The need to convey submissionSet metadata or Folder metadata can be related to access policies to content published. An approach allows the access of content published in accordance to consent given by the patient. The consent is dynamic and can change during time. The availability of content can be discovered only asking the document-sharing infrastructure. The creation of subscription is not dependent to access policies rules. If the Document Metadata Notification Broker sends the references, then the control of access policies is in query/retrieve transactions of the Document Metadata Notification Recipient. It is suggested

615

to use ihe:FolderMetadata topic or ihe:SubmissionSetMetadata topics when it is not desirable to convey more sensible content (wrapped in documentEntry metadata) using notification.

620 Specific security considerations are presented in the Security Considerations section of each transaction in Volume 2.

## 26.6 DSUB Cross Profile Considerations

Within an XDS Affinity Domain:

- 625 • the Document Metadata Notification Broker will most likely be grouped with a Document Registry
- the Document Metadata Subscriber will most likely be grouped with a Document Consumer
- the Document Metadata Publisher will most likely be grouped with a Document Registry
- 630 • the Document Metadata Notification Recipient will likely be grouped with a Document Consumer

## Volume 2b – Transactions (cont'd)

*Add Section 3.52*

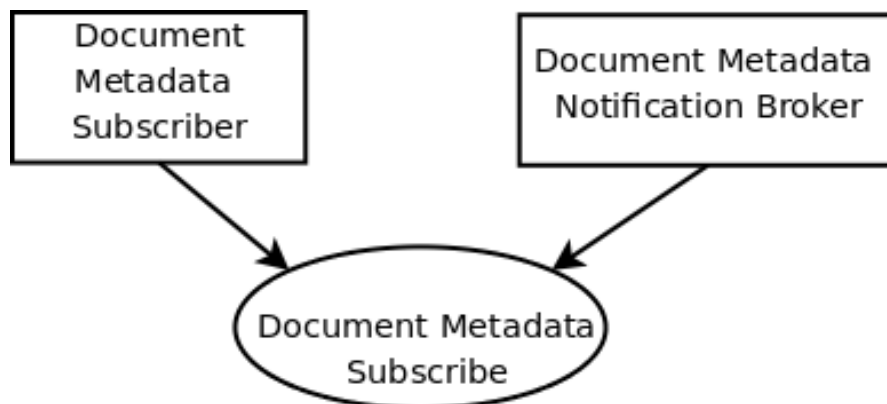
### 635 3.52 Document Metadata Subscribe

This section corresponds to Transaction ITI-52 of the IHE IT Infrastructure Technical Framework. Transaction ITI-52 is used by the Document Metadata Subscriber and the Document Metadata Notification Broker actors.

#### 3.52.1 Scope

640 This transaction involves a request by the Document Metadata Subscriber to the Document Metadata Notification Broker to start a subscription using a particular set of filters, or to cancel an existing subscription.

#### 3.52.2 Use Case Roles



645

**Actor:** Document Metadata Subscriber

**Role:** Sends, on the behalf of Document Metadata Notification Recipients, subscription requests, or subscription cancellation messages to the Document Metadata Notification Broker

**Actor:** Document Metadata Notification Broker

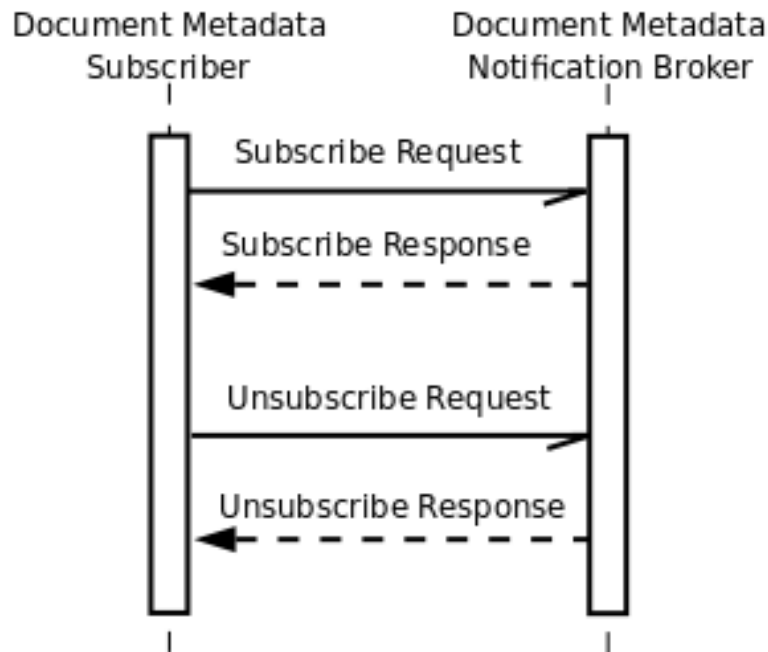
650 **Role:** Manages subscriptions of Document Metadata Notification Recipients

#### 3.52.3 Referenced Standards

- [OASIS Web Services Notification Family of Standards](#)
- [WS-BaseNotification 1.3 OASIS Standard](#)
- [WS-BrokeredNotification 1.3 OASIS Standard](#)

- 655
- [WS-Topics 1.3 OASIS Standard](#)
  - IHE ITI TF-2a: 3.18 - Registry Stored Query Transaction
  - IHE ITI TF-2x: Appendix V

### 3.52.4 Interaction Diagram



660 **Figure 3.52.4-1: Document Metadata Subscribe Sequence**

#### 3.52.4.1 Subscribe Request Message

##### 3.52.4.1.1 Trigger

665 A Document Metadata Notification Recipient's need to initiate a subscription will cause the Document Metadata Subscriber to trigger a Subscribe Request message.

##### 3.52.4.1.2 Message Semantics

670 The Subscribe Request message shall comply with the requirements in the WS-BaseNotification standard. Note that the value of the WS-Addressing Action element is prescribed in the standard, and differs from the requirements of Appendix V. The *wsnt:ConsumerReference* element describes the Web Services endpoint where notifications must be sent. The *wsnt:Filter* element shall contain the topics and values for these topics for which a notification shall be sent. Implementers of the pattern shall specify the topic content to be put within the *wsnt:Filter* element. The *wsnt:Filter* element shall contain a *TopicExpression* element.

675 This transaction uses simple topics in accordance with the WS-Topics standard and as specified in ITI TF-2b: 3.52.5.

This transaction uses a filter based on the-Registry Stored Query [ITI-18] transaction syntax and semantics as specified in ITI TF-2b: 3.52.5 Subscription Topics and Filter Expressions.

### 3.52.4.1.3 Expected Actions

The Notification Broker shall be capable of maintaining multiple concurrent Subscriptions.

680 The Notification Broker shall keep track of each unique subscription and will provide a unique subscription reference which shall be used by the Subscriber to send subsequent cancellations

The Subscriber may indicate the duration of the subscription using the *wst:InitialTerminationTime* element, where a time stamp (expressed as an XML Schema *dateTime* data type value) or a duration (expressed as an XML Schema *duration* data type value) can be used.

685

If the Document Metadata Notification Broker is not able to understand a filter expression it SHALL create faults in accordance with the following rules:

- 690 • **InvalidFilterFault:** the Subscribe message contained a filter that was not understood or supported by the Document Metadata Notification Broker. For example the ReferenceIdList filter parameter exists and the Document Metadata Notification Broker cannot satisfy it.
- **TopicExpressionDialectUnknownFault:** the Subscribe message contained a TopicExpression filter having a dialect that was not understood or supported by the Document Metadata Notification Broker.
- 695 • **InvalidTopicExpressionFault:** the Subscribe message contained a TopicExpression filter where the contents of the filter did not match the dialect specified.
- **TopicNotSupportedFault:** the Subscribe message contained a TopicExpression filter that referenced a topic that was not supported by the Document Metadata Notification Broker. This Fault SHALL be generated by a Document Metadata Notification Broker that does not support the Folder Subscription Option if it receives a request for a subscription using the topic *ihe:FolderMetadata*.
- 700 • **SubscribeCreationFailedFault:** The Document Metadata Notification Broker failed to process the Subscribe message. The Document Metadata Notification Broker SHOULD use a more specific fault message if possible. The Document Metadata Notification Broker MAY include a hint in the fault message indicating why it failed to process the
- 705 Subscribe message.

#### 3.52.4.1.3.1 Folder Subscription Option

A Document Metadata Notification Broker supporting the Folder Subscription Option shall accept and understand a subscription created for an existing folder.



710 **3.52.4.1.4 Example Subscribe Request Message (subscription on a document filter)**

```
715 <?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://www.w3.org/2005/08/addressing"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
  xmlns:rims="urn:oasis:names:tc:ebxml-regrep:xsd:rims:3.0"
  xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
720 envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
  http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd
  urn:oasis:names:tc:ebxml-regrep:xsd:rims:3.0 ../schema/ebRS/rims.xsd">
  <s:Header>
    <a:Action>http://docs.oasis-open.org/wsn/bw-
725 2/NotificationProducer/SubscribeRequest</a:Action>
    <a:MessageID>382dcdc7-8e84-9fdc-8443-48fd83bca938</a:MessageID>
    <a:To s:mustUnderstand="1">http://localhost:8080/services/initiatingGateway/query</a:To>
  </s:Header>
  <s:Body>
    <wsnt:Subscribe>
730 <!-- The Recipient on whose behalf the subscription is requested - the address where
the notification is to be sent -->
    <wsnt:ConsumerReference>
      <a:Address>https://NotificationRecipientServer/xdsBnotification</a:Address>
    </wsnt:ConsumerReference>
735 <wsnt:Filter>
      <wsnt:TopicExpression Dialect="http://docs.oasis-open.org/wsn/t-
1/TopicExpression/Simple">ihe:MinimalDocumentEntry</wsnt:TopicExpression>
      <rims:AdhocQuery id="urn:uuid:aa2332d0-f8fe-11e0-be50-0800200c9a66">
740 <rims:Slot name="$XSDSDocumentEntryPatientId">
        <rims:ValueList>
          <rims:Value>'st3498702^^^&amp;1.3.6.1.4.1.21367.2005.3.7&amp;ISO'</rims:Value>
        </rims:ValueList>
745 </rims:Slot>
        <rims:Slot name="$XSDSDocumentEntryHealthcareFacilityTypeCode">
          <rims:ValueList>
            <rims:Value>('Emergency
750 Department^^healthcareFacilityCodingScheme')</rims:Value>
          </rims:ValueList>
        </rims:Slot>
      </rims:AdhocQuery>
    </wsnt:Filter>
    <wsnt:InitialTerminationTime>2010-05-31T00:00:00.00000Z</wsnt:InitialTerminationTime>
755 </wsnt:Subscribe>
  </s:Body>
</s:Envelope>
```

**3.52.4.2 Subscribe Response Message**

**3.52.4.2.1 Trigger**

760 This message is an immediate response to a Subscribe Request, and it is sent from the Document Metadata Notification Broker to the Document Metadata Subscriber.

**3.52.4.2.2 Message Semantics**

The Subscribe Response message shall comply with the requirements in the WS-BaseNotification standard, including the use of the appropriate SOAP Fault messages. Note that

765 the value of the WS-Addressing Action element is prescribed in the standard, and differs from the requirements of ITI TF-2x:Appendix V.

The subscription identifier is assigned by the Notification Broker as a subscription reference, communicated in the response in the SOAP body in `wsnt:SubscribeResponse/wsnt:SubscriptionReference` (a WS-Addressing endpoint). The subscription reference shall consist of:

- 770
- an *Address* element, containing a webservices endpoint

In order to unsubscribe, the request shall be sent to the endpoint specified in the Address component of the SubscriptionReference.

### 3.52.4.2.3 Expected Actions

775 If the Document Metadata Subscriber had indicated a requested duration for the subscription, the Document Metadata Notification Broker shall send the assigned duration for the subscription using the `wsnt:TerminationTime` element.

If the Document Metadata Subscriber had not indicated a requested duration for the subscription, the Document Metadata Notification Broker may send an assigned duration for the subscription (if any), using the `wsnt:TerminationTime` element.

780 If the Document Metadata Notification Broker sends an assigned duration for the subscription, the Subscriber shall associate the assigned duration with the accepted subscription request.

The Document Metadata Subscriber shall associate the accepted subscription request with the subscription reference address assigned by the Document Metadata Notification Broker in order to be able to send cancellations for existing subscriptions.

### 785 3.52.4.2.4 Example

```
790 <?xml version="1.0" encoding="UTF-8"?>
    <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
      xmlns:a="http://www.w3.org/2005/08/addressing"
      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
      xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
      xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
795 envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
      http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd">
      <s:Header>
        <a:Action>http://docs.oasis-open.org/wsn/bw-
795 2/NotificationProducer/SubscribeResponse</a:Action>
      </s:Header>
      <s:Body>
        <wsnt:SubscribeResponse>
800 <!-- A WS-Addressing endpoint, where modification and cancelation requests for this
          subscription must be sent -->
          <wsnt:SubscriptionReference>
            <a:Address>https://NotificationBrokerServer/Subscription/382dcdc7-8e84-9fdc-
805 8443</a:Address>
          </wsnt:SubscriptionReference>
          <wsnt:TerminationTime>2008-05-31T00:00:00Z</wsnt:TerminationTime>
          </wsnt:SubscribeResponse>
        </s:Body>
      </s:Envelope>
```

### 810 3.52.4.3 Unsubscribe Request Message

#### 3.52.4.3.1 Trigger

When a subscription is no longer needed, a Document Metadata Subscriber will trigger an Unsubscribe Request message.

#### 3.52.4.3.2 Message Semantics

815 The Unsubscribe Request message shall comply with the requirements in the WS-BaseNotification standard. The message conveys the request to cancel an existing subscription. Note that the value of the WS-Addressing Action element is prescribed in the standard, and differs from the requirements of ITI TF-2x:Appendix V.

#### 3.52.4.3.3 Expected Actions

820 The Document Metadata Subscriber shall send this message to the endpoint associated with the existing subscription.

The Document Metadata Notification Broker shall cancel the corresponding subscription, and respond with an Unsubscribe Response message. In the case when, for whatever reason, the subscription cannot be canceled, the Document Metadata Notification Broker shall respond with  
825 a ResourceUnknownFault or an UnableToDestroySubscriptionFault SOAP Fault message as appropriate.

#### 3.52.4.3.4 Example

```
830 <?xml version="1.0" encoding="UTF-8"?>
      <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
      xmlns:a="http://www.w3.org/2005/08/addressing"
      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
      xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
      xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
835 envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
      http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd">
        <s:Header>
          <a:Action>http://docs.oasis-open.org/wsn/bw-
840 2/SubscriptionManager/UnsubscribeRequest</a:Action>
          <a:MessageID>382dc9-8e86-9fde-8445-48fd83bca93a</a:MessageID>
          <a:To>https://NotificationBrokerServer/Subscription/382dc9-8e84-9fdc-8443</a:To>
        </s:Header>
        <s:Body>
          <wsnt:Unsubscribe/>
845 </s:Body>
      </s:Envelope>
```

### 3.52.4.4 Unsubscribe Response Message

#### 3.52.4.4.1 Trigger

This message is an immediate response to an Unsubscribe Request message, and it is sent from the Document Metadata Notification Broker to the Document Metadata Subscriber.

850 **3.52.4.4.2 Message Semantics**

The Unsubscribe Response message shall comply with the requirements in the WS-BaseNotification standard. This message indicates that an Unsubscribe message was successfully processed. Note that the value of the WS-Addressing Action element is prescribed in the standard, and differs from the requirements of ITI TF-2x:Appendix V.

855 **3.52.4.4.3 Expected Actions**

The Document Metadata Notification Broker shall cancel the corresponding subscription.

The Document Metadata Subscriber shall mark the corresponding subscription as successfully terminated.

**3.52.4.4.4 Example**

860

```
<?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://www.w3.org/2005/08/addressing"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
  xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
865 envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
  http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd">
  <s:Header>
    <a:Action>http://docs.oasis-open.org/wsn/bw-
870 2/SubscriptionManager/UnsubscribeResponse</a:Action>
  </s:Header>
  <s:Body>
    <wsnt:UnsubscribeResponse/>
875 </s:Body>
</s:Envelope>
```

**3.52.5 Subscription Topics and Filter Expressions**

This transaction restricts the subscription topic to be one of FullDocumentEntry or MinimalDocumentEntry (ITI TF-2b: 3.52.5.1) and restricts the semantics of filter expressions to the semantics of a subset (ITI TF-2b: 3.52.5.2) of the Registry Stored Query [ITI-18].

880 **3.52.5.1 Topics**

This transaction defines simple topics as described in the WS-Topics specification. If the Document Metadata Notification Broker supports the Folder Subscription Option it shall support all the following topics in a Document Metadata Subscribe Request; otherwise it shall reject subscription Request which specify folder's topic generating a fault (see section 3.52.4.1.3

885 “Expected Actions”). The Document Metadata Subscriber may support a subset of these topics:

**3.52.5.1.1 ihe:FullDocumentEntry**

This topic indicates that the events for which the subscription is made shall be Document Entry registrations, and that the notification shall contain the full metadata describing each matching Document Entry as described in the Notification transaction in ITI TF-2b: 3.53.4.1.2.

890 **3.52.5.1.2 ihe:MinimalDocumentEntry**

This topic indicates that the events for which the subscription is made shall be Document Entry registrations, and that the notification shall contain the minimal set of data describing each matching Document Entry as described in the Document Metadata Notify transaction in ITI TF-2b: 3.53.4.1.2.

895 **3.52.5.1.3 ihe:FolderMetadata**

This topic indicates that the events for which the subscription is made shall be creating or updating a Folder, and that the notification shall contain the full metadata describing each matching Folder object, as described in the Document Metadata Notify transaction in ITI TF-2b: 3.53.4.1.2.

900 **3.52.5.1.4 ihe:SubmissionSetMetadata**

This topic indicates that the event for which the subscription is made shall be creating a SubmissionSet and that the notification shall contain the full metadata describing the match with the SubmissionSet object, as described in the Document Metadata Notify transaction in ITI TF-2b: 3.53.4.1.2.

905 **3.52.5.2 Building Filter Expressions**

The XDS metadata, specified in ITI TF-3: 4.1, describes the objects which are used in a document registration. The Registry Stored Query transaction [ITI-18] uses a subset of the metadata to build a list of queries available to a XDS Document Consumer to search for documents with specific characteristics. The list of queries is in ITI TF-2a: 3.18.4.1.2.3.7. The transaction Document Metadata Subscribe uses the syntax of the Registry Stored Query [ITI-18] transaction for the creation of the filtering expression.

Filters can be created using the parameters of the FindDocuments, FindDocumentsByReferenceId, GetFolders, FindFolders, FindSubmissionSet queries defined within the Registry Stored Query transaction and use the syntax of the FindDocuments FindDocumentsByReferenceId, FindSubmissionSets, GetFolders, FindFolders queries to express the filter.

The evaluation of filter expressions is based on the XDS metadata model. In this transaction, the stream of events for which subscriptions are possible is limited to events representing the existence of Folder, SubmissionSet and documentEntry Objects. The Document Metadata Notification Broker becomes aware of such events either via a Document Metadata Publish transaction [ITI-54], or via other mechanisms not specified by IHE. The Document Metadata Notification Broker shall determine if there is a subscription which matches any of the Document Entry Objects, Folder Objects or SubmissionSet Object in an event.

A match means that if a Registry Stored Query, with the same parameters as the filter expression in the subscription, were sent to a XDS Document Registry containing the Document Entry

Objects, SubmissionSet Object or Folder Object from the event, the result of this Stored Query would contain one or more of these Objects.

930 In an XDS Affinity Domain context, the applicable events are likely to be Register Document Set [ITI-42] transaction containing one or more Document Entry objects. In this case, the Document Metadata Notification Broker may have to map between the model within which the events took place, and the XDS metadata model.

A good understanding of the Registry Stored Query transaction and the XDS metadata is necessary to understand how the filter expressions work. For example, if the filter expression below were implemented as a stored query on the registry

935

```
<rim:AdhocQuery id="urn:uuid:aa2332d0-f8fe-11e0-be50-0800200c9a66"
xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0">
  <rim:Slot name="$XDSDocumentEntryPatientId">
    <rim:ValueList>
      <rim:Value>'st3498702^^&1.3.6.1.4.1.21367.2005.3.7&ISO'</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Slot name="$XDSDocumentEntryEventCodeList">
    <rim:ValueList>
      <rim:Value>('44950^^codScheme', '44955^^codScheme', '44960^^codScheme', '
940 44970^^codScheme', '44979^^codScheme')</rim:Value>
    </rim:ValueList>
  </rim:Slot>
</rim:AdhocQuery>
```

950 it will return all document entries for patient with ID st3498702 (assigned by an authority identified by the OID 1.3.6.1.4.1.21367.2005.3.7) where the event code metadata contains at least one of the codes listed (in this case CPT codes for various appendectomies). When used as a filter expression, the same structure will yield a match against a document entry in an XDS registry submission, where the document entry is for patient with ID st3498702 and the event code is "44970". The following snippet shows an example of such a submission:

955

```
<lcm:SubmitObjectsRequest>
  <rim:RegistryObjectList>
    <rim:ExtrinsicObject id="Document01" mimeType="text/xml" objectType="urn:uuid:7edca82f-
960 054d-47f2-a032-9b2a5b5186c1">
      ...
      <rim:Classification classificationScheme="urn:uuid:2c6b8cb7-8b2a-4051-b291-
b1ae6a575ef4" classifiedObject="Document01" nodeRepresentation="44950">
965         <rim:Name>
           <rim:LocalizedString value="Appendectomy"/>
         </rim:Name>
         <rim:Slot name="codingScheme">
           <rim:ValueList>
970             <rim:Value>CPT codes</rim:Value>
           </rim:ValueList>
         </rim:Slot>
       </rim:Classification>
      ...
975     <rim:ExternalIdentifier id="ei01" registryObject="Document01"
identificationScheme="urn:uuid:58a6f841-87b3-4a3e-92fd-a8ffeff98427"
value="'st3498702^^&1.3.6.1.4.1.21367.2005.3.7&ISO'">
       <rim:Name>
         <rim:LocalizedString value="XDSDocumentEntry.patientId"/>
       </rim:Name>
     </rim:ExternalIdentifier>
  </rim:ExtrinsicObject>
</lcm:SubmitObjectsRequest>
```

```

980         </rim:Name>
           </rim:ExternalIdentifier>
...
           <rim:ExtrinsicObject>
             </rim:RegistryObjectList>
</lcm:SubmitObjectsRequest>

```

985 When a Document Metadata Notification Subscriber constructs a filter expression, it shall include the whole stored query expression (as shown above) directly in the Subscribe Request message as a child of the wsnt:Filter element:

```

990 <?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://www.w3.org/2005/08/addressing"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
  xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
995   xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd
urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0 ../schema/ebRS/rim.xsd">
1000  <s:Header>
    <a:Action>http://docs.oasis-open.org/wsn/bw-
2/NotificationProducer/SubscribeRequest</a:Action>
    <a:MessageID>382dc7-8e84-9fdc-8443-48fd83bca938</a:MessageID>
  </s:Header>
  <s:Body>
1005    <wsnt:Subscribe>
      <!-- The Recipient on whose behalf the subscription is requested - the address where
the notification is to be sent -->
      <wsnt:ConsumerReference>
1010        <a:Address>https://NotificationRecipientServer/xdsBnotification</a:Address>
      </wsnt:ConsumerReference>
      <wsnt:Filter>
        <wsnt:TopicExpression Dialect="http://docs.oasis-open.org/wsn/t-
1/TopicExpression/Simple">ihe:FullDocumentEntry</wsnt:TopicExpression>
1015        <rim:AdhocQuery id="urn:uuid:aa2332d0-f8fe-11e0-be50-0800200c9a66">
          <rim:Slot name="$XDSDocumentEntryPatientId">
            <rim:ValueList>
1020              <rim:Value>'st3498702^^&1.3.6.1.4.1.21367.2005.3.7&ISO'</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="$XDSDocumentEntryEventCodeList">
            <rim:ValueList>
1025              <rim:Value>('44950^^codScheme', '44955^^codScheme', '44960^^codScheme', '
44970^^codScheme', '44979^^codScheme')</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          </rim:AdhocQuery>
        </wsnt:Filter>
1030        <wsnt:InitialTerminationTime>2008-07-31T00:00:00.00000Z</wsnt:InitialTerminationTime>
      </wsnt:Subscribe>
    </s:Body>
  </s:Envelope>

```

1035 How the Document Metadata Notification Broker evaluates the filter expression, and how it performs the matching against the existing subscriptions, is out of scope of this transaction. It is expected that such implementation details will allow vendors to differentiate themselves in the marketplace.

1040 It is important to note that not all stored queries, and not all parameters defined for the stored queries, are suitable for filter expressions. The Document Metadata Notification Broker shall support the following filters and associated parameters when used in subscription requests, and the Document Metadata Subscriber may support a subset of these:

### 3.52.5.2.1 Subscriptions for DocumentEntry metadata

1045 A Document Metadata Notification Broker that accepts a Subscribe Request containing filter expressions created using DocumentEntry metadata shall yield a match as described in section 3.52.5.2. Parameters that can be used for creating the filter expression are described below:

1. **\$XDSDocumentEntryPatientId**: this required parameter contains the patient ID for which a document entry is being registered in the XDS Document Registry
2. **\$XDSDocumentEntryClassCode**: this parameter matches against the **XDSDocumentEntry.classCode** metadata elements in a given registry submission
- 1050 3. **\$XDSDocumentEntryTypeCode**: this parameter matches against the **XDSDocumentEntry.typeCode** metadata elements in a given registry submission
4. **\$XDSDocumentEntryReferenceIdList**: this parameter matches against the **XDSDocumentEntry.referenceIdList** metadata elements in a given registry submission
- 1055 

Note: The ReferenceIdList attribute is optional. If the parameter is specified, the filter matches only documents where the ID contains the value conveyed in the parameter. If the document does not contain a value in the ReferenceIdList, there is no match.
5. **\$XDSDocumentEntryPracticeSettingCode**: this parameter matches against the **XDSDocumentEntry.practiceSettingCode** metadata elements in a given registry submission
- 1060 6. **\$XDSDocumentEntryHealthcareFacilityTypeCode**: this parameter matches against the **XDSDocumentEntry.healthcareFacilityTypeCode** metadata elements in a given registry submission
7. **\$XDSDocumentEntryEventCodeList**: this parameter matches against the **XDSDocumentEntry.eventCodeList** metadata elements in a given registry submission
- 1065 8. **\$XDSDocumentEntryConfidentialityCode**: this parameter matches against the **XDSDocumentEntry.confidentialityCode** metadata elements in a given registry submission
9. **\$XDSDocumentEntryFormatCode**: this parameter matches against the **XDSDocumentEntry.formatCode** metadata elements in a given registry submission
- 1070 10. **\$XDSDocumentEntryAuthorPerson**: this parameter matches against the **XDSDocumentEntry.author** metadata elements in a given registry submission. All properties of this parameter specified in ITI TF-2a: 3.18.4.1.2.3.7.1 are applicable in this transaction.



1075 The AdHocQuery/@id attribute SHALL store an identifier specific for the type of filter used in creating the subscription. The UUID that identifies subscriptions for DocumentEntry’s metadata is:

“urn:uuid:aa2332d0-f8fe-11e0-be50-0800200c9a66”.

An example of subscription on a document filter is presented below:

```
1080 <?xml version="1.0" encoding="UTF-8"?>
1085 <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://www.w3.org/2005/08/addressing"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
  xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
  xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
  envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
  http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd
  urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0 ../schema/ebRS/rim.xsd">
1090   <s:Header>
     <a:Action>http://docs.oasis-open.org/wsn/bw-
  2/NotificationProducer/SubscribeRequest</a:Action>
     <a:MessageID>382dc7-8e84-9fdc-8443-48fd83bca938</a:MessageID>
     <a:To s:mustUnderstand="1">http://localhost:8080/services/initiatingGateway/query</a:To>
1095   </s:Header>
     <s:Body>
       <wsnt:Subscribe>
         <!-- The Recipient on whose behalf the subscription is requested - the address where
  1100 the notification is to be sent -->
         <wsnt:ConsumerReference>
           <a:Address>https://NotificationRecipientServer/xdsBnotification</a:Address>
         </wsnt:ConsumerReference>
         <wsnt:Filter>
           <wsnt:TopicExpression Dialect="http://docs.oasis-open.org/wsn/t-
  1105 1/TopicExpression/Simple">ihe:MinimalDocumentEntry</wsnt:TopicExpression>
           <rim:AdhocQuery id="urn:uuid:aa2332d0-f8fe-11e0-be50-0800200c9a66">
             <rim:Slot name="$XDSDocumentEntryPatientId">
               <rim:ValueList>
                 <rim:Value>'st3498702^^&amp;1.3.6.1.4.1.21367.2005.3.7&amp;ISO'</rim
  1110 :Value>
                 </rim:ValueList>
               </rim:Slot>
               <rim:Slot name="$XDSDocumentEntryHealthcareFacilityTypeCode">
                 <rim:ValueList>
                 <rim:Value>('Emergency
  1115 Department^^healthcareFacilityCodingScheme')</rim:Value>
                 </rim:ValueList>
               </rim:Slot>
             </rim:AdhocQuery>
           </wsnt:Filter>
           <wsnt:InitialTerminationTime>2010-05-31T00:00:00.00000Z</wsnt:InitialTerminationTime>
         </wsnt:Subscribe>
       </s:Body>
     </s:Envelope>
```

### 1125 3.52.5.2.2 Subscriptions for folders metadata

This type of filter shall be accepted by a Document Metadata Notification Broker that supports the Folder Subscription Option. Document Metadata Notification Broker that accepts a Subscribe Request containing a filter expression based on the GetFolders and FindFolders stored queries shall yield a match as described in section 3.52.5.2. A Document Metadata Subscriber MAY be

1130 able to create a filter expression that includes XDSFolder.uniqueId, XDSFolder.patientId, XDSFolder.codeList. Parameters that can be used for creating the filter expression are described below:

1. **\$XDSFolderPatientId**: this is a required parameter that matches with the metadata XDSFolder.patientId;
- 1135 2. **\$XDSFolderUniqueId**: this parameter matches with the metadata XDSFolder.uniqueId. This is an optional parameter that contains the identifier defined for the Folder Object subscribed;
3. **\$XDSFolderCodeList**: this parameter matches with the metadata XDSFolder.codeList. This allows creating a filter specifying the type of clinical activity that resulted in placing  
1140 XDS Documents in an XDSFolder.

The AdHocQuery/@id attribute SHALL contain an identifier specific for the type of filter used in creating the subscription. The UUID that identifies subscriptions for Folder’s metadata is:

“urn:uuid:9376254e-da05-41f5-9af3-ac56d63d8ebd”

An example of subscription on a folder filter is presented below:

1145

```
<?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://www.w3.org/2005/08/addressing"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
  xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
  xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
  envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
  http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd
  urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0 ../schema/ebRS/rim.xsd">
  <s:Header>
    <a:Action>http://docs.oasis-open.org/wsn/bw-
  1150 2/NotificationProducer/SubscribeRequest</a:Action>
    <a:MessageID>382dc7-8e84-9fdc-8443-48fd83bca938</a:MessageID>
    <a:To s:mustUnderstand="1">http://localhost:8080/services/initiatingGateway/query</a:To>
  </s:Header>
  <s:Body>
    <wsnt:Subscribe>
      <!-- The Recipient on whose behalf the subscription is requested - the address where
  1165 the notification is to be sent -->
      <wsnt:ConsumerReference>
        <a:Address>https://NotificationRecipientServer/xdsBnotification</a:Address>
      </wsnt:ConsumerReference>
      <wsnt:Filter>
        <wsnt:TopicExpression Dialect="http://docs.oasis-open.org/wsn/t-
  1170 1/TopicExpression/Simple">ihe:FolderMetadata</wsnt:TopicExpression>
        <rim:AdhocQuery id="urn:uuid:9376254e-da05-41f5-9af3-ac56d63d8ebd">
          <rim:Slot name="$XDSFolderPatientId">
            <rim:ValueList>
              <rim:Value>'st3498702^^&1.3.6.1.4.1.21367.2005.3.7&ISO'</rim
  1175 :Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="$XDSFolderCodeList">
            <rim:ValueList>
              <rim:Value>'FolderCodeExample^^folderCodeListCodingScheme'</rim:Val
  1180 ue>
            </rim:ValueList>
          </rim:Slot>
        </rim:AdhocQuery>
      </wsnt:Filter>
    </wsnt:Subscribe>
  </s:Body>
</s:Envelope>
```

1185

```
                </rim:ValueList>
                </rim:Slot>
            </rim:AdhocQuery>
        </wsnt:Filter>
        <wsnt:InitialTerminationTime>2010-05-31T00:00:00.000000Z</wsnt:InitialTerminationTime>
    </wsnt:Subscribe>
</s:Body>
</s:Envelope>
```

1190

### 3.52.5.2.3 Subscriptions for SubmissionSets metadata

1195

Document Metadata Notification Broker that accepts a Subscribe Request containing a filter expression based on the FindSubmissionSets stored query shall yield a match as described in section 3.52.5.2. The subscription filter expression represents a subset of the FindSubmissionSets query parameters, with a specific extension. A Document Metadata Subscriber MAY be able to create a filter expression that includes XDSSubmissionSet.patientId, XDSSubmissionSet.sourceId, XDSSubmissionSet.author and XDSSubmissionSet.intendedRecipient. Parameters that can be used for this type of filter are described below:

1200

1. **\$XDSSubmissionSetPatientId**: this is a required parameter that contains the identifier of the patient target of the clinical content published by a submission and represent the value of the XDSSubmissionSet.PatientId metadata;
- 1205 2. **\$XDSSubmissionSetSourceId**: this optional parameter identifies the source of the content published by the submission and represent the value of the XDSSubmissionSets.sourceId metadata;
3. **\$XDSSubmissionSetAuthor**: this optional parameter identifies the author person of the content published by the submission and represents the value of the XDSSubmissionSets.author metadata. This parameter may be multi-valued;
- 1210 4. **\$XDSSubmissionSetIntendedRecipient**: this is an optional parameter for the subscription. A Document Metadata Subscriber shall be able to subscribe this parameter in addition to other parameters which have direct correspondence with query parameters. This parameter represents the value of the XDSSubmissionSet.intendedRecipient metadata. This parameter identifies initial targets intended for a submission. This parameter may be multi-valued.

1215

Note: intendedRecipient attribute is optional. If the parameter is specified, the filter matches only submissionSets where the intendedRecipient contains the value conveyed in the parameter. If the document does not contain a value in the intendedRecipient, there is no match.

1220

The AdHocQuery/@id attribute SHALL contain an identifier specific for the type of filter used in creating the subscription. The UUID that identifies subscriptions for SubmissionSet's metadata is:

“urn:uuid:fbede94e-dbdc-4f6b-bc1f-d730e677cece”.

An example of subscription on a SubmissionSet filter is presented below:

```

1225 <?xml version="1.0" encoding="UTF-8"?>
1230 <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
      xmlns:a="http://www.w3.org/2005/08/addressing"
      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
      xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
      xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
      xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
1235 envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
      http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd
      urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0 ../schema/ebRS/rim.xsd">
      <s:Header>
        <a:Action>http://docs.oasis-open.org/wsn/bw-
1240 2/NotificationProducer/SubscribeRequest</a:Action>
        <a:MessageID>382dcdc7-8e84-9fdc-8443-48fd83bca938</a:MessageID>
        <a:To s:mustUnderstand="1">http://localhost:8080/services/initiatingGateway/query</a:To>
      </s:Header>
      <s:Body>
        <wsnt:Subscribe>
          <!-- The Recipient on whose behalf the subscription is requested - the address where
1245 the notification is to be sent -->
          <wsnt:ConsumerReference>
            <a:Address>https://NotificationRecipientServer/xdsBnotification</a:Address>
          </wsnt:ConsumerReference>
          <wsnt:Filter>
            <wsnt:TopicExpression Dialect="http://docs.oasis-open.org/wsn/t-
1250 1/TopicExpression/Simple">ihe:SubmissionSetMetadata</wsnt:TopicExpression>
            <rim:AdhocQuery id="urn:uuid:fbede94e-dbd8-4f6b-bc1f-d730e677cece">
              <rim:Slot name="$XDSSubmissionSetPatientId">
                <rim:ValueList>
                  <rim:Value>'st3498702^^^&amp;1.3.6.1.4.1.21367.2005.3.7&amp;ISO'</rim
1255 :Value>
                </rim:ValueList>
              </rim:Slot>
              <rim:Slot name="$XDSSubmissionSetIntendedRecipient">
                <rim:ValueList>
                  <rim:Value>('Some Hospital%')</rim:Value>
                  <rim:Value>('|Welby%')</rim:Value>
                </rim:ValueList>
              </rim:Slot>
            </rim:AdhocQuery>
          </wsnt:Filter>
          <wsnt:InitialTerminationTime>2010-05-31T00:00:00.00000Z</wsnt:InitialTerminationTime>
          </wsnt:Subscribe>
        </s:Body>
      </s:Envelope>

```

1270

#### 3.52.5.2.4 Patient-Independent Subscriptions for Document metadata

A Document Metadata Subscriber that supports the Patient-Independent Subscription Option shall be able to create subscriptions in accordance with the filter semantics defined in this section.

1275 A Document Metadata Notification Broker that supports Patient-Independent Subscription Option shall accept subscription filters defined in this section.

This section defines a filter semantics that allow the subscription for patient-independent DocumentEntry metadata. Each filter parameter described below is optional; however, at least one of \$XDSDocumentEntryClassCode, \$XDSDocumentEntryTypeCode,

- 1280 \$XSDSDocumentEntryPracticeSettingCode or \$XSDSDocumentEntryHealthcareFacilityTypeCode shall be specified.
1. **\$XSDSDocumentEntryClassCode:** this parameter is optional and matches against the XSDSDocumentEntry.classCode metadata elements in a given registry submission
  - 1285 2. **\$XSDSDocumentEntryTypeCode:** this parameter is optional and matches against the XSDSDocumentEntry.typeCode metadata elements in a given registry submission
  3. **\$XSDSDocumentEntryPracticeSettingCode:** this parameter is optional and matches against the XSDSDocumentEntry.practiceSettingCode metadata elements in a given registry submission
  - 1290 4. **\$XSDSDocumentEntryHealthcareFacilityTypeCode:** this parameter is optional and matches against the XSDSDocumentEntry.healthcareFacilityTypeCode metadata elements in a given registry submission
  5. **\$XSDSDocumentEntryEventCodeList:** this parameter is optional and matches against the XSDSDocumentEntry.eventCodeList metadata elements in a given registry submission
  - 1295 6. **\$XSDSDocumentEntryConfidentialityCode:** this parameter is optional and matches against the XSDSDocumentEntry.confidentialityCode metadata elements in a given registry submission
  7. **\$XSDSDocumentEntryFormatCode:** this parameter is optional and matches against the XSDSDocumentEntry.formatCode metadata elements in a given registry submission
  - 1300 8. **\$XSDSDocumentEntryAuthorPerson:** this parameter is optional and matches against the XSDSDocumentEntry.author metadata elements in a given registry submission. All properties of this parameter specified in ITI TF-2a: 3.18.4.1.2.3.7.1 are applicable in this transaction.
- 1305 The AdHocQuery/@id attribute SHALL be “urn:uuid:742790e0-aba6-43d6-9f1f-e43ed9790b79”.

An example of patient-independent subscription for documents is presented below:

```
1310 <?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://www.w3.org/2005/08/addressing"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
1315  xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
  xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd
1320 urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0 ../schema/ebRS/rim.xsd">
  <s:Header>
```

```
1325 <a:Action>http://docs.oasis-open.org/wsn/bw-
2/NotificationProducer/SubscribeRequest</a:Action>
<a:MessageID>382dcdc7-8e84-9fdc-8443-48fd83bca938</a:MessageID>
<a:To s:mustUnderstand="1">http://notificationBroker/ad45m6o5493a</a:To>
</s:Header>
<s:Body>
1330 <wsnt:Subscribe>
<!-- The Recipient on whose behalf the subscription is requested - the address where
the notification is to be sent -->
<wsnt:ConsumerReference>
<a:Address>https://NotificationRecipientServer/xdsBnotification</a:Address>
</wsnt:ConsumerReference>
<wsnt:Filter>
1335 <wsnt:TopicExpression Dialect="http://docs.oasis-open.org/wsn/t-
1/TopicExpression/Simple">ihe:MinimalDocumentEntry</wsnt:TopicExpression>
<rim:AdhocQuery id="urn:uuid:742790e0-aba6-43d6-9f1f-e43ed9790b79">
<rim:Slot name="$XDSSDocumentEntryHealthcareFacilityTypeCode">
1340 <rim:ValueList>
<rim:Value>('Emergency
Department^^healthcareFacilityCodingScheme')</rim:Value>
</rim:ValueList>
</rim:Slot>
</rim:AdhocQuery>
1345 </wsnt:Filter>
<wsnt:InitialTerminationTime>2010-05-31T00:00:00.00000Z</wsnt:InitialTerminationTime>
</wsnt:Subscribe>
</s:Body>
</s:Envelope>
```

1350 **3.52.5.2.5 Patient-Independent Subscriptions for SubmissionSet metadata**

A Document Metadata Subscriber that supports Patient-Independent Subscription Option shall be able to create subscriptions in accordance with the filter semantics defined in this section.

A Document Metadata Notification Broker that supports Patient-Independent Subscription Option shall accept subscription filters defined in this section.

1355

This section defines a filter semantic that allows the subscription for patient-independent SubmissionSet metadata. Each filter parameter described below is optional; however, at least one of \$XDSSubmissionSetSourceId, \$XDSSubmissionSetAuthor or \$XDSSubmissionSetIntendedRecipient shall be specified.

1360

1. **\$XDSSubmissionSetSourceId**: this optional parameter identifies the source of the content published by the submission and represent the value of the XDSSubmissionSets.sourceId metadata;
2. **\$XDSSubmissionSetAuthor**: this optional parameter identifies the author person of the content published by the submission and represents the value of the XDSSubmissionSets.author metadata. This parameter may be multi-valued;
3. **\$XDSSubmissionSetIntendedRecipient**: this is an optional parameter for the subscription. A Document Metadata Subscriber shall be able to subscribe to this parameter in addition to other parameters that have direct correspondence with query

1365

1370 parameters in [ITI-18]. This parameter represents the value of the  
XDSSubmissionSet.intendedRecipient metadata. This parameter may be multi-valued.

Note: intendedRecipient attribute is optional. If the parameter is specified, the filter matches only SubmissionSets where the intendedRecipient contains the value conveyed in the parameter.

1375

The AdHocQuery/@id attribute SHALL contain  
“urn:uuid:868cad3d-ec09-4565-b66c-1be10d034399”.

An example of patient-independent subscription for SubmissionSet metadata is presented below:

1380

```
<?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://www.w3.org/2005/08/addressing"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
  xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
  xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
  envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
  http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd
  urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0 ../schema/ebRS/rim.xsd">
  <s:Header>
    <a:Action>http://docs.oasis-open.org/wsn/bw-
  2/NotificationProducer/SubscribeRequest</a:Action>
    <a:MessageID>382dcdc7-8e84-9fdc-8443-48fd83bca938</a:MessageID>
    <a:To s:mustUnderstand="1">http://notificationBroker/qiwmn34dek</a:To>
  </s:Header>
  <s:Body>
    <wsnt:Subscribe>
      <!-- The Recipient on whose behalf the subscription is requested - the address where
  1400 the notification is to be sent -->
      <wsnt:ConsumerReference>
        <a:Address>https://NotificationRecipientServer/xdsBnotification</a:Address>
      </wsnt:ConsumerReference>
      <wsnt:Filter>
        <wsnt:TopicExpression Dialect="http://docs.oasis-open.org/wsn/t-
  1405 1/TopicExpression/Simple">ihe:SubmissionSetMetadata</wsnt:TopicExpression>
        <rim:AdhocQuery id="urn:uuid:868cad3d-ec09-4565-b66c-1be10d034399">
          <rim:Slot name="$XDSSubmissionSetIntendedRecipient">
            <rim:ValueList>
              <rim:Value>('Some Hospital%')</rim:Value>
              <rim:Value>('|Welby%')</rim:Value>
            </rim:ValueList>
          </rim:Slot>
        </rim:AdhocQuery>
        </wsnt:Filter>
        <wsnt:InitialTerminationTime>2010-05-31T00:00:00.000000Z</wsnt:InitialTerminationTime>
      </wsnt:Subscribe>
    </s:Body>
  </s:Envelope>
```

1420

### 3.52.5.3 Combining topics and filter expressions

A topic defines static rules for creating notifications. This transaction defines four topics in ITI TF-2b: 3.52.5.1. Each subscription request shall contain exactly one topic expression.

1425 A filter expression is equivalent to a specific stored query with certain parameters. Filter conditions expressed as query parameters and used in the expressions must satisfy the same requirements as a corresponding Registry Stored Query:

- the values for all specified query parameters must match (AND all different parameters)
- at least one of the values of multi-valued parameters must match (OR the values in a multi-valued query parameter)

1430 Topics, defined in Section 3.52.5.1 and filter expressions, defined in Section 3.52.5.2, can only be used in specific combinations. These combinations are described in Table 3.52.5.3-1:

**Table 3.52.5.3-1: Topics and Filter Expression Combinations**

Filter Expression	Topic Expression
subscription for DocumentEntry	ihe:FullDocumentEntry
	ihe:MinimalDocumentEntry
subscription for Folders	ihe:FolderMetadata
subscription for SubmissionSets	ihe:SubmissionSetMetadata
subscription for DocumentEntry (Patient-Independent)	ihe:FullDocumentEntry
	ihe:MinimalDocumentEntry
subscription for SubmissionSet (Patient-Independent)	ihe:SubmissionSetMetadata

### 1435 3.52.6 Security Considerations

The risk assessment for the Document Metadata Subscribe transaction is described in the risk assessment spreadsheet for the Document Metadata Subscription Profile, which is available from IHE at [http://wiki.ihe.net/images/4/46/DSUB\\_risk\\_assesment.xls](http://wiki.ihe.net/images/4/46/DSUB_risk_assesment.xls). The derived mitigations are as follows:

- 1440
- Document Metadata Subscriber and Document Metadata Notification Broker shall be grouped with an ATNA Secure Node or Secure Application for Node Authentication and Audit Trails
  - The use of encrypted TLS is recommended when the transmission is not otherwise secured (e.g., transmission over a secure network)

1445 As it is possible through the document metadata subscribe transaction to maliciously overload the Document Metadata Notification Recipient actors, it is recommended that a strong authentication be used in combination with access rights enforcement and that authentication



data should be conveyed through XUA. This recommendation also addresses the possibility of malicious cancellations of subscriptions.

1450 Additionally, it is recommended that organizational measures be taken to avoid:

- overload of a Document Metadata Notification Recipient through subscription which cannot be cancelled because the subscription id has been lost e.g., through an administrative service allowing cancellation of subscription under well-defined circumstances
- 1455 • cancellation of a subscription unnoticed by the intended document metadata notification recipient e.g., through an informative message (out of the scope of this profile) sent to the intended recipient

1460 The Document Metadata Subscriber Actor that supports the Patient-Independent Subscription Option can create a subscription without specifying the patientId subscription parameter. This functionality increases risks connected with policy changes between subscription time and notification event. It is recommended to take organizational/technical measures to reduce this risk. This profile provides the ihe:MinimalDocumentEntry topic expression to avoid disclosing sensitive information. Using this type of topic expression allows delegation of the access control decisions to the Document Sharing infrastructure.

1465 **3.52.6.1 Audit Record Considerations**

The Document Metadata Subscribe transaction is a Query Information event as defined in table ITI TF-2a: 3.20.6-1. The actors involved shall record audit events according to the following:

**3.52.6.1.1 Document Metadata Subscriber audit message:**

	Field Name	Opt	Value Constraints
<b>Event</b> AuditMessage/ EventIdentification	EventID	M	EV(110112, DCM, "Query")
	EventActionCode	M	"C" (Create) for Subscription message exchange "D" (Delete) for Unsubscribe message exchange
	EventDateTime	M	<i>not specialized</i>
	EventOutcomeIndicator	M	<i>not specialized</i>
	EventTypeCode	M	EV("ITI-52", "IHE Transactions", "Document Metadata Subscribe")
<b>Source (Document Metadata Subscriber) (1)</b>			
<b>Human Requestor (0..n)</b>			
<b>Destination (Document Metadata Notification Broker) (1)</b>			
<b>Audit Source (Document Metadata Subscriber) (1)</b>			
<b>Patient (0..1)</b>			
<b>Query Parameters(1)</b>			

1470

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Where:

<b>Source</b> AuditMessage/ ActiveParticipant	<i>UserID</i>	<i>U</i>	<i>not specialized</i>
	AlternativeUserID	<b>M</b>	the process ID as used within the local operating system in the local system logs.
	<i>UserName</i>	<i>U</i>	<i>not specialized</i>
	<i>UserIsRequestor</i>	<i>U</i>	<i>not specialized</i>
	RoleIDCode	<b>M</b>	EV(110153, DCM, “Source”)
	NetworkAccessPointTypeCode	<b>M</b>	“1” for machine (DNS) name, “2” for IP address
	NetworkAccessPointID	<b>M</b>	The machine name or IP address

<b>Human Requestor (if known)</b> AuditMessage/ ActiveParticipant	UserID	<b>M</b>	Identity of the human that initiated the transaction.
	<i>AlternativeUserID</i>	<i>U</i>	<i>not specialized</i>
	<i>UserName</i>	<i>U</i>	<i>not specialized</i>
	<i>UserIsRequestor</i>	<i>U</i>	<i>not specialized</i>
	RoleIDCode	<b>U</b>	Access Control role(s) the user holds that allows this transaction.
	<i>NetworkAccessPointTypeCode</i>	<i>U</i>	<i>not specialized</i>
	<i>NetworkAccessPointID</i>	<i>U</i>	<i>not specialized</i>

<b>Destination</b> AuditMessage/ ActiveParticipant	UserID	<b>M</b>	SOAP endpoint URI.
	<i>AlternativeUserID</i>	<i>U</i>	<i>not specialized</i>
	<i>UserName</i>	<i>U</i>	<i>not specialized</i>
	<i>UserIsRequestor</i>	<i>U</i>	<i>not specialized</i>
	RoleIDCode	<b>M</b>	EV(110152, DCM, “Destination”)
	NetworkAccessPointTypeCode	<b>M</b>	“1” for machine (DNS) name, “2” for IP address
	NetworkAccessPointID	<b>M</b>	The machine name or IP address

1475

<b>Audit Source</b> AuditMessage/ AuditSourceIdentification	<i>AuditSourceID</i>	<i>U</i>	<i>not specialized.</i>
	<i>AuditEnterpriseSiteID</i>	<i>U</i>	<i>not specialized</i>
	<i>AuditSourceTypeCode</i>	<i>U</i>	<i>not specialized</i>

1480

<b>Patient (if known)</b> <small>(AuditMessage/ParticipantObjectIdentification)</small>	ParticipantObjectTypeCode	M	“1” (Person)
	ParticipantObjectTypeCodeRole	M	“1” (Patient)
	<i>ParticipantObjectDataLifeCycle</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectIDTypeCode</i>	M	<i>not specialized</i>
	<i>ParticipantObjectSensitivity</i>	<i>U</i>	<i>not specialized</i>
	ParticipantObjectID	M	The patient ID in HL7 CX format.
	<i>ParticipantObjectName</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectQuery</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectDetail</i>	<i>U</i>	<i>not specialized</i>

<b>Query Parameters</b> <small>(AuditMessage/ParticipantObjectIdentification)</small>	ParticipantObjectTypeCode	M	“2” (system object)
	ParticipantObjectTypeCodeRole	M	“24” (query)
	<i>ParticipantObjectDataLifeCycle</i>	<i>U</i>	<i>not specialized</i>
	ParticipantObjectIDTypeCode	M	EV(“ITI-52”, “IHE Transactions”, “Document Metadata Subscribe”)
	<i>ParticipantObjectSensitivity</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectID</i>	<i>U</i>	<i>not specialized</i>
	ParticipantObjectName	C	If known the value of <ihe:HomeCommunityId/>
	ParticipantObjectQuery	M	the value of <wsnt:Filter> element, base64 encoded.
	<i>ParticipantObjectDetail</i>	<i>U</i>	<i>not specialized</i>

**3.52.6.1.2 Document Metadata Notification Broker audit message:**

	Field Name	Opt	Value Constraints
<b>Event</b> <small>AuditMessage/EventIdentification</small>	EventID	M	EV(110112, DCM, “Query”)
	EventActionCode	M	“C” (Create) for Subscription message exchange “D” (Delete) for Unsubscribe message exchange
	<i>EventDateTime</i>	<i>M</i>	<i>not specialized</i>
	<i>EventOutcomeIndicator</i>	<i>M</i>	<i>not specialized</i>
	EventTypeCode	M	EV(“ITI-52”, “IHE Transactions”, “Document Metadata Subscribe”)
<b>Source (Document Metadata Subscriber) (1)</b>			
<b>Destination (Document Metadata Notification Broker) (1)</b>			
<b>Audit Source (Document Metadata Notification Broker) (1)</b>			
<b>Patient (0..1)</b>			
<b>Query Parameters(1)</b>			

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Where:

<b>Source</b> AuditMessage/ ActiveParticipant	<i>UserID</i>	<i>U</i>	<i>not specialized</i>
	<i>AlternativeUserID</i>	<i>U</i>	<i>not specialized</i>
	<i>UserName</i>	<i>U</i>	<i>not specialized</i>
	<i>UserIsRequestor</i>	<i>U</i>	<i>not specialized</i>
	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

1485

<b>Destination</b> AuditMessage/ ActiveParticipant	UserID	M	SOAP endpoint URI.
	<i>AlternativeUserID</i>	M	the process ID as used within the local operating system in the local system logs.
	<i>UserName</i>	<i>U</i>	<i>not specialized</i>
	<i>UserIsRequestor</i>	<i>U</i>	<i>not specialized</i>
	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

<b>Audit Source</b> AuditMessage/ AuditSourceIdentification	<i>AuditSourceID</i>	<i>U</i>	<i>not specialized</i>
	<i>AuditEnterpriseSiteID</i>	<i>U</i>	<i>not specialized</i>
	<i>AuditSourceTypeCode</i>	<i>U</i>	<i>not specialized</i>

<b>Patient (If known)</b> (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	"1" (Person)
	ParticipantObjectTypeCodeRole	M	"1" (Patient)
	<i>ParticipantObjectDataLifeCycle</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectIDTypeCode</i>	<i>M</i>	<i>not specialized</i>
	<i>ParticipantObjectSensitivity</i>	<i>U</i>	<i>not specialized</i>
	ParticipantObjectID	M	The patient ID in HL7 CX format.
	<i>ParticipantObjectName</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectQuery</i>	<i>U</i>	<i>not specialized</i>
<i>ParticipantObjectDetail</i>	<i>U</i>	<i>not specialized</i>	

1490

<b>Query Parameters</b> <small>(AuditMessage/ ParticipantObjectIdentification)</small>	ParticipantObjectTypeCode	M	“2” (system object)
	ParticipantObjectTypeRole	M	“24” (query)
	<i>ParticipantObjectDataLifeCycle</i>	<i>U</i>	<i>not specialized</i>
	ParticipantObjectTypeCode	M	EV(“ITI-52”, “IHE Transactions”, “Document Metadata Subscribe”)
	<i>ParticipantObjectSensitivity</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectID</i>	<i>U</i>	<i>not specialized</i>
	ParticipantObjectQuery	M	the value of <wsnt:Filter> element, base64 encoded.
	<i>ParticipantObjectDetail</i>	<i>U</i>	<i>not specialized</i>

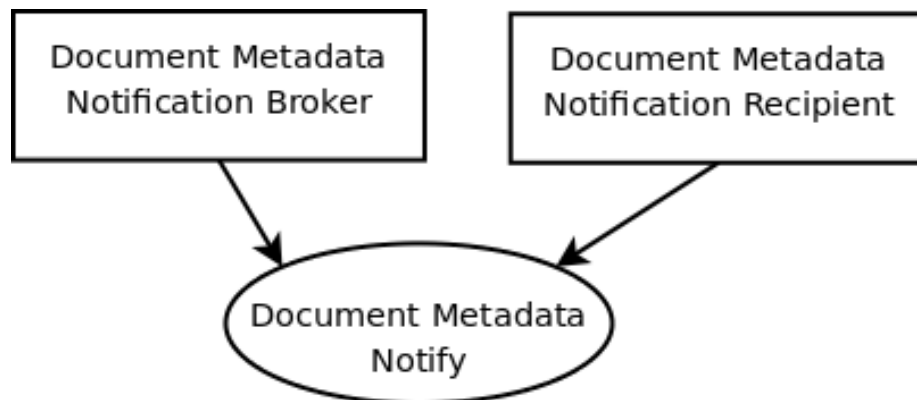
### 3.53 Document Metadata Notify

1495 This section corresponds to Transaction ITI-53 of the IHE IT Infrastructure Technical Framework. Transaction ITI-53 is used by the Document Metadata Notification Recipient and the Document Metadata Notification Broker actors.

#### 3.53.1 Scope

1500 This transaction delivers a notification from the Document Metadata Notification Broker to the Document Metadata Notification Recipient about an event which matches an existing subscription.

#### 3.53.2 Use Case Roles



**Actor:** Document Metadata Notification Broker

1505 **Role:** Sends notifications to subscribed Document Metadata Notification Recipients based on received Publish transactions

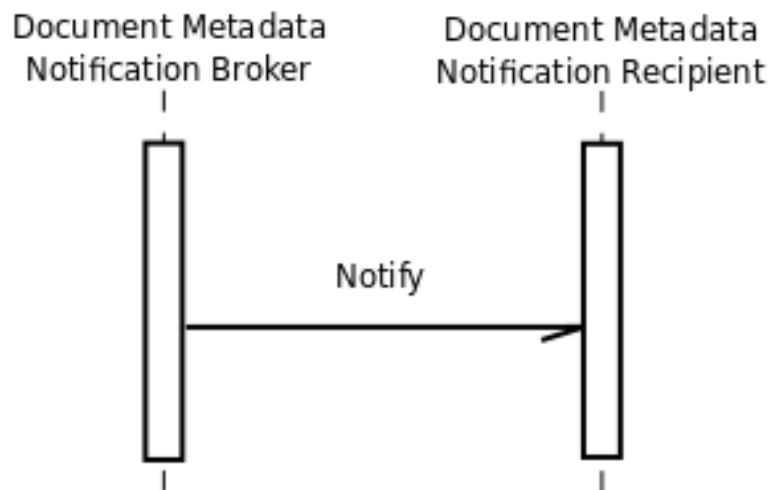
**Actor:** Document Metadata Notification Recipient

**Role:** Receives and processes notifications about events matching a set of filter expressions.

### 3.53.3 Referenced Standards

- 1510
  - [OASIS Web Services Notification Family of Standards](#)
  - [WS-BaseNotification 1.3 OASIS Standard](#)
  - [WS-BrokeredNotification 1.3 OASIS Standard](#)
  - [WS-Topics 1.3 OASIS Standard](#)
  - IHE ITI TF-2b: 3.43.4.2.2
- 1515
  - IHE ITI TF-2x: Appendix V

### 3.53.4 Interaction Diagram



**Figure 3.53.4-1: Document Metadata Notify Sequence**

#### 1520 3.53.4.1 Notify Message

##### 3.53.4.1.1 Trigger

When an event occurs where the topics of the event match the filter requirements of one or more existing subscriptions, the Document Metadata Notification Broker will trigger a Notification message to the corresponding Document Metadata Notification Recipient. The description of matching subscriptions to events can be found in ITI TF-2b: 3.52.5.2.

1525

### 3.53.4.1.2 Message Semantics

The Notify message shall comply with the requirements in the WS-BaseNotification standard. Note that the value of the WS-Addressing Action element is prescribed in the standard, and differs from the requirements of ITI TF-2x:Appendix V.

- 1530 The Notify message convey in the *wsnt:Notify/wsnt:NotificationMessage/wsnt:Message* the event that matched with a subscription. Depending on the event which triggered the notification, there may be one or more Document Entry Objects, Folder Objects, or SubmissionSet Objects whose metadata matches the filter conditions of any particular subscription. This transaction defines the following structures for conveying a Notify message:
- 1535       **A Full Notification**, which shall be sent if the subscription request included the topic *ihe:FullDocumentEntry* (see ITI TF-2b: 3.52.5.1). In this case, the notification shall consist of parts of the payload of a Register Document Set-b Transaction as defined in ITI TF-2b: 3.42.4.1. The *<lcm:SubmitObjectsRequest>* element is the only child of the *wsnt:Notify/wsnt:NotificationMessage/wsnt:Message* element in this message. The *<rim:RegistryObjectList>* element shall be the only child of the *<lcm:SubmitObjectsRequest>* element. Only *<rim:ExtrinsicObject>* elements representing Document Entries shall be sent within the *<rim:RegistryObjectList>* element.
- 1540
- 1545       **A Minimal Notification**, which shall be sent if the subscription request included the topic *ihe:MinimalDocumentEntry*. In this case, the notification shall consist of parts of the payload of a Register Document Set-b Transaction as defined in ITI TF-2b: 3.42.4.1. The *<lcm:SubmitObjectsRequest>* element is the only child of the *wsnt:Notify/wsnt:NotificationMessage/wsnt:Message* element in this message. The *<rim:RegistryObjectList>* element shall be the only child of the
- 1550       *<lcm:SubmitObjectsRequest>* element. Only *<rim:ObjectRef>* elements representing Document Entries shall be sent within the *<rim:RegistryObjectList>* element.
- 1555       **A Folder Notification**, which shall be sent if the subscription request included the topic *ihe:FolderMetadata*. A Document Metadata Notification Broker that supports Folder Subscription Option shall be able to create this type of notification. In this case, the response consists of parts of the payload of a Register Document Set-b Transaction as defined in ITI TF-2b:3.42.4.1. The *<lcm:SubmitObjectsRequest>* element is the only child of the
- 1560       *wsnt:Notify/wsnt:NotificationMessage/wsnt:Message* element in this message. The *<rim:RegistryObjectList>* element shall be the only child of the *<lcm:SubmitObjectsRequest>* element. Only one *<rim:RegistryPackage>* element representing the folder object shall be sent within the *<rim:RegistryObjectList>* element and shall be characterized by classification scheme: *classificationScheme="urn:uuid:d9d542f3-6cc4-48b6-8870-  
1565       ea235fbc94c2"* (that represents an object of Folder type).

1570           **A submissionSet Notification**, which shall be sent if the subscription request included the topic `ihe:SubmissionSetMetadata`. In this case the response consists of parts of the payload of a Register Document Set-b Transaction as defined in ITI TF-2b:3.42.4.1. The `<lcm:SubmitObjectsRequest>` element is the only child of the `wsnt:Notify/wsnt:NotificationMessage/wsnt:Message` element in this message. The `<rim:RegistryObjectList>` element shall be the only child of the `<lcm:SubmitObjectsRequest>` element. Only one `<rim:RegistryPackage>` element representing the submissionSet object shall be sent within the `<rim:RegistryObjectList>` element and shall be characterized by classification scheme: `classificationScheme="urn:uuid:a54d6aa5-d40d-43f9-88c5-b4633d873bdd"` (that represents an object of submissionSet type).

1575

1580           There shall be a single `wsnt:Notify/wsnt:NotificationMessage/wsnt:Message` element in this transaction. If multiple objects need to be represented in a single notification, the WS-BaseNotification standard allows this to be done.

### 3.53.4.1.3 Expected Actions

1585           The Document Metadata Notification Recipient shall accept the Notify message. The Notify message shall be processed according to the configuration and business logic of the actor. Possibilities include conveying the notification information to other systems and/or users.

1590           The Document Metadata Notification Broker may send the filter conditions of the subscription, and/or the address of the producer reference from where the Document Metadata Publish transaction originated. Both of these alternatives increase certain security risks, their use should be determined by local policy for security and confidentiality.

1595           If the Document Metadata Notification Recipient is grouped with a Notification Pull Point, the notification received SHALL be stored in the related Pull Point resource.

### 3.53.4.1.4 Examples

#### 3.53.4.1.4.1 Full Notification Example (ihe:FullDocumentEntry)

```
1595 <?xml version="1.0" encoding="UTF-8"?>
1600 <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
      xmlns:a="http://www.w3.org/2005/08/addressing"
      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
      xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
      xmlns:lcm="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0"
      xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
      xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0 ../schema/ebRS/rim.xsd" urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0 ../schema/ebRS/lcm.xsd">
1605   <s:Header>
      <a:Action>http://docs.oasis-open.org/wsn/bw-2/NotificationConsumer/Notify</a:Action>
      <a:MessageID>382dcdca-8e87-9fdf-8446-48fd83bca93b</a:MessageID>
```



```

1610     <a:To>https://NotificationRecipientServer/xdsBnotification</a:To>
</s:Header>
<s:Body>
  <wsnt:Notify>
    <wsnt:NotificationMessage>
1615      <wsnt:SubscriptionReference>
        <a:Address>https://NotificationBrokerServer/Subscription/382dcdc7-8e84-9fdc-
8443-48fd83bca938</a:Address>
        </wsnt:SubscriptionReference>
        <wsnt:Topic Dialect="http://docs.oasis-open.org/wsn/t-
1620 1/TopicExpression/Simple">ihe:FullDocumentEntry</wsnt:Topic>
        <wsnt:ProducerReference>
          <a:Address>https://ProducerReference</a:Address>
        </wsnt:ProducerReference>
        <wsnt:Message>
1625      <lcm:SubmitObjectsRequest>
          <rim:RegistryObjectList>
            <rim:ExtrinsicObject id="Document01" mimeType="text/xml"
objectType="urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1">
            ...
1630      <rim:Classification classificationScheme="urn:uuid:2c6b8cb7-8b2a-
4051-b291-b1ae6a575ef4" classifiedObject="Document01" nodeRepresentation="44950">
              <rim:Name>
                <rim:LocalizedString value="Appendectomy"/>
              </rim:Name>
              <rim:Slot name="codingScheme">
                <rim:ValueList>
                  <rim:Value>CPT codes</rim:Value>
                </rim:ValueList>
              </rim:Slot>
            </rim:Classification>
1635      ...
              <rim:ExternalIdentifier id="ei01" registryObject="Document01"
identificationScheme="urn:uuid:58a6f841-87b3-4a3e-92fd-a8ffeff98427"
value="'st3498702^^^&1.3.6.1.4.1.21367.2005.3.7&ISO'">
                <rim:Name>
                  <rim:LocalizedString value="XDSDocumentEntry.patientId"/>
                </rim:Name>
              </rim:ExternalIdentifier>
1640      ...
            </rim:ExtrinsicObject>
          </rim:RegistryObjectList>
        </lcm:SubmitObjectsRequest>
      </wsnt:Message>
    </wsnt:NotificationMessage>
  </wsnt:Notify>
1645 </s:Body>
</s:Envelope>

```

### 3.53.4.1.4.2 Minimal Notification Example (ihe:MinimalDocumentEntry)

```

1660 <?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://www.w3.org/2005/08/addressing"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
1665  xmlns:xds="urn:ihe:iti:xds-b:2007"
  xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
  xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd urn:ihe:iti:xds-b:2007
1670  ../../schema/IHE/XDS_b_DocumentRepository.xsd urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0
  ../../schema/ebRS/rim.xsd">

```

1775

```
<s:Header>
  <a:Action>http://docs.oasis-open.org/wsn/bw-2/NotificationConsumer/Notify</a:Action>
  <a:MessageID>382dcdca-8e87-9fdf-8446-48fd83bca93b</a:MessageID>
  <a:To>https://NotificationRecipientServer/xdsBnotification</a:To>
</s:Header>
<s:Body>
  <wsnt:Notify>
    <wsnt:NotificationMessage>
      <wsnt:SubscriptionReference>
        <a:Address>https://NotificationBrokerServer/Subscription/382dcdc7-8e84-9fdc-
1780 8443-48fd83bca938</a:Address>
      </wsnt:SubscriptionReference>
      <wsnt:Topic Dialect="http://docs.oasis-open.org/wsn/t-
1785 1/TopicExpression/Simple">ihe:MinimalDocumentEntry</wsnt:Topic>
      <wsnt:ProducerReference>
        <a:Address>https://ProducerReference</a:Address>
      </wsnt:ProducerReference>
      <wsnt:Message>
        <lcm:SubmitObjectsRequest>
          <rim:RegistryObjectList>
            <rim:ObjectRef id="urn:uuid:93606bcf-9494-43ec-9b4e-a7748d1a838d" />
          </rim:RegistryObjectList>
        </lcm:SubmitObjectsRequest>
      </wsnt:Message>
    </wsnt:NotificationMessage>
  </wsnt:Notify>
</s:Body>
</s:Envelope>
```

### 3.53.4.1.4.3 SubmissionSet Notification Example (ihe:SubmissionSetMetadata)

1700

```
<?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
1705  xmlns:a="http://www.w3.org/2005/08/addressing"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
  xmlns:lcm="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0"
  xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
  xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
1710 envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
  http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd
  urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0 ../schema/ebRS/rim.xsd" urn:oasis:names:tc:ebxml-
  regrep:xsd:lcm:3.0 ../schema/ebRS/lcm.xsd">
  <s:Header>
    <a:Action>http://docs.oasis-open.org/wsn/bw-2/NotificationConsumer/Notify</a:Action>
    <a:MessageID>382dcdca-8e87-9fdf-8446-48fd83bca93b</a:MessageID>
    <a:To>https://NotificationRecipientServer/xdsBnotification</a:To>
  </s:Header>
  <s:Body>
    <wsnt:Notify>
      <wsnt:NotificationMessage>
        <wsnt:SubscriptionReference>
          <a:Address>https://NotificationBrokerServer/Subscription/382dcdc7-8e84-9fdc-
1715 8443-48fd83bca938</a:Address>
        </wsnt:SubscriptionReference>
        <wsnt:Topic Dialect="http://docs.oasis-open.org/wsn/t-1/TopicExpression/Simple"
          >ihe:SubmissionSetMetadata</wsnt:Topic>
        <wsnt:ProducerReference>
          <a:Address>https://ProducerReference</a:Address>
        </wsnt:ProducerReference>
        <wsnt:Message>
          <lcm:SubmitObjectsRequest
1720  xsi:schemaLocation="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0
```

1725

1730

```

1735    ../../schema/ebRS/lcm.xsd"
        xmlns:lcm="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0"
        xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
        xmlns:rs="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0">
1740    <rim:RegistryObjectList>
        <rim:RegistryPackage id="SubmissionSet01">
        <!-- here all the SubmissionSet metadata -->
        </rim:RegistryPackage>
1745    <rim:Classification id="c110" classifiedObject="SubmissionSet01"
        classificationNode="urn:uuid:a54d6aa5-d40d-43f9-88c5-
b4633d873bdd"/>
        </rim:RegistryObjectList>
        </lcm:SubmitObjectsRequest>
1750    </wsnt:Message>
        </wsnt:NotificationMessage>
        </wsnt:Notify>
        </s:Body>
    </s:Envelope>

```

#### 1755 3.53.4.1.4.4 Folder Notification Example (ihe:FolderMetadata)

```

1760 <?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://www.w3.org/2005/08/addressing"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
  xmlns:lcm="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0"
  xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
1765  xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
  envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
  http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd
  urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0 ../../schema/ebRS/rim.xsd" urn:oasis:names:tc:ebxml-
  regrep:xsd:lcm:3.0 ../../schema/ebRS/lcm.xsd">
  <s:Header>
    <a:Action>http://docs.oasis-open.org/wsn/bw-2/NotificationConsumer/Notify</a:Action>
    <a:MessageID>382dc7ca-8e87-9fdf-8446-48fd83bca93b</a:MessageID>
    <a:To>https://NotificationRecipientServer/xdsBnotification</a:To>
  </s:Header>
1775  <s:Body>
    <wsnt:Notify>
      <wsnt:NotificationMessage>
        <wsnt:SubscriptionReference>
          <a:Address>https://NotificationBrokerServer/Subscription/382dc7-8e84-9fdc-
1780  8443-48fd83bca93b</a:Address>
        </wsnt:SubscriptionReference>
        <wsnt:Topic Dialect="http://docs.oasis-open.org/wsn/t-1/TopicExpression/Simple"
          >ihe:FolderMetadata</wsnt:Topic>
        <wsnt:ProducerReference>
          <a:Address>https://ProducerReference</a:Address>
1785  </wsnt:ProducerReference>
        <wsnt:Message>
          <lcm:SubmitObjectsRequest
            xsi:schemaLocation="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0
1790  ../../schema/ebRS/lcm.xsd"
            xmlns:lcm="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0"
            xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
            xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
            xmlns:rs="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0">
            <rim:RegistryObjectList>

```

```
1795         <rim:RegistryPackage id="Folder01">
           <!-- here all the Folder metadata -->
1800         </rim:RegistryPackage>
           <rim:Classification id="Fol" classifiedObject="Folder01"
           classificationNode="urn:uuid:d9d542f3-6cc4-48b6-8870-
ea235fbc94c2" />
1805         </rim:RegistryObjectList>
           </lcm:SubmitObjectsRequest>
           </wsnt:Message>
           </wsnt:NotificationMessage>
           </wsnt:Notify>
           </s:Body>
1810 </s:Envelope>
```

### 3.5.3.5 Security Considerations

1815 The risk assessment for the Document Metadata Notify transaction is described in the risk assessment spreadsheet for the Document Metadata Subscription Profile, which is available from IHE at [http://wiki.ihe.net/images/4/46/DSUB\\_risk\\_assesment.xls](http://wiki.ihe.net/images/4/46/DSUB_risk_assesment.xls). The derived mitigations are as follows:

Document Metadata Notification Broker and Document Metadata Notification Recipients shall be grouped with an ATNA Secure Node or Secure Application for Node Authentication and Audit Trails

1820 The use of encrypted TLS is recommended when the transmission is not otherwise secured (e.g., transmission over a secure network)

1825 Additionally, it is recommended that the Document Metadata Notify transaction be associated with a SAML assertion outlining authorizations to the notification content so that the Document Metadata Notification Recipient will be able to enforce these authorizations (for example, see the XUA Profile ITI TF-1: 13). This recommendation is highly dependent on an XDS Affinity Domain managing roles for its users correctly as most of the authorizations will be based on roles.

#### 3.5.3.5.1 Audit Record Considerations

1830 The Document Metadata Notify transaction is an 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 Part 15 “Data Export”/“Data Import”, with the following exceptions.

##### 3.5.3.5.1.1 Document Metadata Notification Recipient audit message:

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	Field Name	Opt	Value Constraints
<b>Event</b> AuditMessage/ EventIdentification	EventID	M	EV(110107, DCM, "Import")
	EventActionCode	M	"C" (Create)
	EventDateTime	M	not specialized
	EventOutcomeIndicator	M	not specialized
	EventTypeCode	M	EV("ITI-53", "IHE Transactions", "Document Metadata Notify")
<b>Source (Document Metadata Notification Broker) (1)</b>			
<b>Destination (Document Metadata Notification Recipient) (1)</b>			
<b>Human Requestor (0..n)</b>			
<b>Audit Source (Document Metadata Notification Recipient) (1)</b>			
<b>Patient (0..1)</b>			
<b>Document (1..n)</b>			

Where:

<b>Source</b> AuditMessage/ ActiveParticipant	UserID	M	When WS-Addressing is used: <From/>
	AlternativeUserID	U	not specialized
	UserName	U	not specialized
	UserIsRequestor	U	not specialized
	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

<b>Destination</b> AuditMessage/ ActiveParticipant	UserID	U	not specialized
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	U	not specialized
	UserIsRequestor	U	not specialized
	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

<b>Human Requestor (if known)</b> AuditMessage/ ActiveParticipant	UserID	M	Identity of the human that initiated the transaction.
	AlternativeUserID	U	not specialized
	UserName	U	not specialized
	UserIsRequestor	U	not specialized
	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.

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	<i>NetworkAccessPointTypeCode</i>	<i>U</i>	<i>not specialized</i>
	<i>NetworkAccessPointID</i>	<i>U</i>	<i>not specialized</i>

1840

<b>Audit Source</b> AuditMessage/ AuditSourceIdentification	<i>AuditSourceID</i>	<i>U</i>	<i>not specialized</i>
	<i>AuditEnterpriseSiteID</i>	<i>U</i>	<i>not specialized</i>
	<i>AuditSourceTypeCode</i>	<i>U</i>	<i>not specialized</i>

<b>Patient (if-known)</b> (AuditMessage/ ParticipantObjectIdentification)	<i>ParticipantObjectTypeCode</i>	<i>M</i>	<i>“1” (Person)</i>
	<i>ParticipantObjectTypeCodeRole</i>	<i>M</i>	<i>“1” (Patient)</i>
	<i>ParticipantObjectDataLifeCycle</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectTypeCode</i>	<i>M</i>	<i>not specialized</i>
	<i>ParticipantObjectSensitivity</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectID</i>	<i>M</i>	The patient ID in HL7 CX format.
	<i>ParticipantObjectName</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectQuery</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectDetail</i>	<i>U</i>	<i>not specialized</i>

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<b>Document Folder Submission Set</b> (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	“2” (System)
	ParticipantObjectTypeCodeRole	M	“3” (report)
	<i>ParticipantObjectDataLifeCycle</i>	<i>U</i>	<i>not specialized</i>
	ParticipantObjectTypeCode	M	EV(“urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1”, IHE, “DocumentEntry”) EV(“urn:uuid:d9d542f3-6cc4-48b6-8870-ea235fbc94c2”, IHE, “Folder”) EV(urn:uuid:a54d6aa5-d40d-43f9-88c5-b4633d873bdd, IHE, “SubmissionSet”) The Document Metadata Notification Recipient shall include one of these values in accordance with the specific topic used for the creation of the notification. These codes are already defined by IHE and they are the UUIDs which shall be used in constructing and interpreting XDS objects in a submission request.
	<i>ParticipantObjectSensitivity</i>	<i>U</i>	<i>not specialized</i>
	ParticipantObjectID	M	The value of XDSDocumentEntry.entryUUID, XDSFolder.uniqueId, or XDSSubmissionSet.uniqueId. The Document Metadata Notification Recipient shall include one of these values in accordance with the specific topic used for the creation of the notification
	ParticipantObjectName	C	If known the value of homeCommunityId
	<i>ParticipantObjectQuery</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectDetail</i>	<i>U</i>	<i>not specialized</i>

**3.53.5.1.2 Document Metadata Notification Broker audit message:**

	Field Name	Opt	Value Constraints
<b>Event</b> AuditMessage/ EventIdentification	EventID	M	EV(110106, DCM, “Export”)
	EventActionCode	M	“R” (Read)
	<i>EventDateTime</i>	<i>M</i>	<i>not specialized</i>
	<i>EventOutcomeIndicator</i>	<i>M</i>	<i>not specialized</i>
	EventTypeCode	M	EV(“ITI-53”, “IHE Transactions”, “Document Metadata Notify”)
<b>Source (Document Metadata Notification Broker) (1)</b>			
<b>Destination (Document Metadata Notification Recipient) (1)</b>			
<b>Audit Source (Document Metadata Notification Broker) (1)</b>			
<b>Document (1..n)</b>			

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---

Where:

<b>Source</b> AuditMessage/ ActiveParticipant	UserID	M	When WS-Addressing is used: <From/>
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	<i>UserName</i>	<i>U</i>	<i>not specialized</i>
	<i>UserIsRequestor</i>	<i>U</i>	<i>not specialized</i>
	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

<b>Destination</b> AuditMessage/ ActiveParticipant	<i>UserID</i>	<i>U</i>	<i>not specialized</i>
	<i>AlternativeUserID</i>	<i>U</i>	<i>not specialized</i>
	<i>UserName</i>	<i>U</i>	<i>not specialized</i>
	<i>UserIsRequestor</i>	<i>U</i>	<i>not specialized</i>
	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

1865

<b>Audit Source</b> AuditMessage/ AuditSourceIdentification	<i>AuditSourceID</i>	<i>U</i>	<i>not specialized</i>
	<i>AuditEnterpriseSiteID</i>	<i>U</i>	<i>not specialized</i>
	<i>AuditSourceTypeCode</i>	<i>U</i>	<i>not specialized</i>

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<b>Document Folder Submission Set</b>  (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	“2” (System)
	ParticipantObjectTypeRole	M	“3” (report)
	<i>ParticipantObjectDataLifeCycle</i>	<i>U</i>	<i>not specialized</i>
	ParticipantObjectTypeCode	M	EV(“urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1”, IHE, “DocumentEntry”) EV(“urn:uuid:d9d542f3-6cc4-48b6-8870-ea235fbc94c2”, IHE, “Folder”) EV(urn:uuid:a54d6aa5-d40d-43f9-88c5-b4633d873bdd, IHE, “SubmissionSet”) The Document Metadata Notification Broker shall include one of these values in accordance with the specific topic used for the creation of the notification. These codes are already defined by IHE and they are the UUIDs which shall be used in constructing and interpreting XDS objects in a submission request.
	<i>ParticipantObjectSensitivity</i>	<i>U</i>	<i>not specialized</i>
	ParticipantObjectID	M	The value of XDSDocumentEntry.entryUUID, XDSFolder.uniqueId, or XDSSubmissionSet.uniqueId. The Document Metadata Notification Broker shall include one of these values in accordance with the specific topic used for the creation of the notification
	ParticipantObjectName	C	If known the value of homeCommunityId
	<i>ParticipantObjectQuery</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectDetail</i>	<i>U</i>	<i>not specialized</i>

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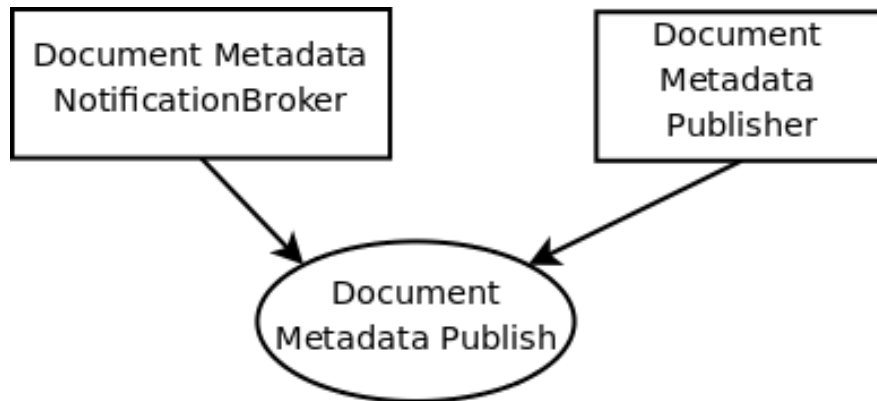
### 3.54 Document Metadata Publish

This section corresponds to Transaction ITI-54 of the IHE IT Infrastructure Technical Framework. Transaction ITI-54 is used by the Document Metadata Notification Broker and Document Metadata Publisher actors.

#### 1885 3.54.1 Scope

This transaction delivers information from the Document Metadata Publisher to the Document Metadata Notification Broker about an event which may have a subscription. The WS Brokered Notification PublisherRegistration requirements are out of scope for this transaction.

### 3.54.2 Use Case Roles



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**Actor:** Document Metadata Notification Broker

**Role:** Receives and processes information about events for which there may be a subscription.

**Actor:** Document Metadata Publisher

**Role:** Publishes information to the Document Metadata Notification Broker when applicable events occur for which a subscription may exist.

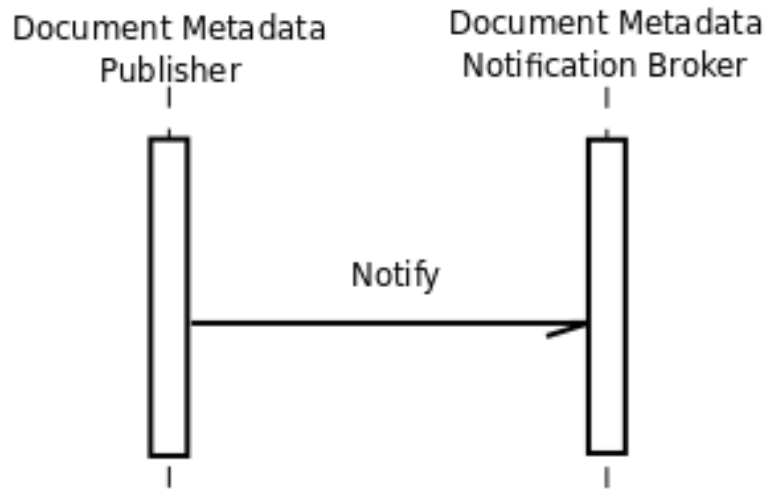
1895

### 3.54.3 Referenced Standards

- [OASIS Web Services Notification Family of Standards](#)
- [WS-BaseNotification 1.3 OASIS Standard](#)
- [WS-BrokeredNotification 1.3 OASIS Standard](#)
- [WS-Topics 1.3 OASIS Standard](#)
- IHE ITI TF-2b: 3.43.4.2.2
- IHE ITI TF-2x: Appendix V

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### 3.54.4 Interaction Diagram



1905

Figure 3.54.4-1: Document Metadata Publish Sequence

#### 3.54.4.1 Notify Message

##### 3.54.4.1.1 Trigger

1910 When an event occurs for which a subscription may exist, the Document Metadata Publisher will trigger a Notification message to the Document Metadata Notification Broker. Events that could trigger a notification are publication of or update to a DocumentEntry, Folder or SubmissionSet.

##### 3.54.4.1.2 Message Semantics

The Document Metadata Publisher Actor shall use a Notify message to communicate published objects to the Document Metadata Notification Broker Actor.

1915 This message shall have one *<NotificationMessage>* element.

This element SHALL have two child elements:

- *<ProducerReference>* that identifies the source of the data published.
- *<Message>* that identifies published objects. This element shall have a single child element *<lcm:SubmitObjectsRequest>* that has only one child element *<rim:RegistryObjectList>*. This element conveys a list of SubmissionSet, Folder, and DocumentEntry objects.

1920

Note: SubmissionSet and Folder objects are constructed from *<rim:RegistryObject>* elements and must include the *<rim:Classification>* that distinguishes SubmissionSet from Folder objects.

Note that there is no subscription information in the Notify message in the Publish transaction.

1925 **3.54.4.1.3 Expected Actions**

The Notify message shall comply with the requirements in the WS-BaseNotification standard.

The Document Metadata Notification Broker shall evaluate the Publish transaction, and if there are matching subscriptions, it shall send the corresponding Notification transaction to the appropriate Document Metadata Notification Recipients.

1930 **3.54.4.1.4 Example**

```
1935 <?xml version="1.0" encoding="UTF-8"?>
1940 <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
1945   xmlns:a="http://www.w3.org/2005/08/addressing"
1950   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
1955   xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
1960   xmlns:ihe="urn:ihe:iti:pub-sub:2008"
1965   xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
1970   xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
1975 envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
1980 http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd urn:ihe:iti:pub-
1985 sub:2008 ../schema/IHE/XDS.b_PublishSubscribe.xsd urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0
1990 ../schema/ebRS/rim.xsd">
1995   <s:Header>
2000     <a:Action>http://docs.oasis-open.org/wsn/bw-2/NotificationConsumer/Notify</a:Action>
2005     <a:MessageID>382dcdca-8e87-9fdf-8446-48fd83bca93b</a:MessageID>
2010     <a:To>https://NotificationBroker/xdsBpublish</a:To>
2015   </s:Header>
2020   <s:Body>
2025     <wsnt:Notify>
2030       <wsnt:NotificationMessage>
2035         <wsnt:ProducerReference>
2040           <a:Address>https://DocumentSource</a:Address>
2045         </wsnt:ProducerReference>
2050         <wsnt:Message>
2055           <lcm:SubmitObjectsRequest>
2060             <rim:RegistryObjectList>
2065               <!-- The list of extrinsic objects -->
2070               <rim:ExtrinsicObject id="Document01" mimeType="text/xml"
2075 objectType="urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1">
2080                 ...
2085               </rim:ExtrinsicObject>
2090             <!-- The list of RegistryPackage objects -->
2095             <rim:RegistryPackage objectType="urn:oasis:names:tc:ebxml-
2100 regrep:ObjectType:RegistryObject:RegistryPackage" id="Submission01">
2105               <rim:Classification classificationNode="urn:uuid:a54d6aa5-d40d-
2110 43f9-88c5-b4633d873bdd" classifiedObject="Submission01" objectType="urn:oasis:names:tc:ebxml-
2115 regrep:ObjectType:RegistryObject:Classification" id="classification01"/>
2120             </rim:RegistryPackage>
2125             <rim:RegistryPackage objectType="urn:oasis:names:tc:ebxml-
2130 regrep:ObjectType:RegistryObject:RegistryPackage" id="Folder01">
2135               <rim:Classification classificationNode="urn:uuid:d9d542f3-6cc4-
2140 48b6-8870-ea235fbc94c2" classifiedObject="Folder01" objectType="urn:oasis:names:tc:ebxml-
2145 regrep:ObjectType:RegistryObject:Classification" id="classification02"/>
2150             </rim:RegistryPackage>
2155           </rim:RegistryObjectList>
2160           </lcm:SubmitObjectsRequest>
2165         </wsnt:Message>
2170       </wsnt:NotificationMessage>
2175     </wsnt:Notify>
2180   </s:Body>
2185 </s:Envelope>
```

### 3.54.5 Security Considerations

1985 The risk assessment for the Document Metadata Publish transaction is described in the risk assessment spreadsheet for the Document Metadata Subscription Profile, which is available from IHE at [http://wiki.ihe.net/images/4/46/DSUB\\_risk\\_assesment.xls](http://wiki.ihe.net/images/4/46/DSUB_risk_assesment.xls). The derived mitigations are as follows:

- 1990 • The Document Metadata Publisher and the Document Metadata Notification Broker shall be grouped with an ATNA Secure Node or Secure Application for Node Authentication and Audit Trails
- The use of encrypted TLS is recommended when the transmission is not otherwise secured (e.g., transmission over a secure network)

#### 3.54.5.1 Audit Record Considerations

1995 The Document Metadata Publish Transaction is an 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 Part 15 “Data Export”/”Data Import”, with the following exceptions.

##### 3.54.5.1.1 Document Metadata Publisher Audit Message:

	Field Name	Opt	Value Constraints
<b>Event</b> AuditMessage/ EventIdentification	EventID	M	EV(110106, DCM, “Export”)
	EventActionCode	M	“R” (Read)
	<i>EventDateTime</i>	<i>M</i>	<i>not specialized</i>
	<i>EventOutcomeIndicator</i>	<i>M</i>	<i>not specialized</i>
	EventTypeCode	M	EV(“ITI-54”, “IHE Transactions”, “Document Metadata Publish”)
<b>Source (Document Metadata Publisher) (1)</b>			
<b>Human Requestor (0..n)</b>			
<b>Destination (Document Metadata Notification Broker) (1)</b>			
<b>Audit Source (Document Metadata Publisher) (1)</b>			
<b>Patient (0..1)</b>			
<b>Document (1..n)</b>			

2000

Where:

---

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<b>Source</b> AuditMessage/ ActiveParticipant	<i>UserID</i>	<i>U</i>	<i>not specialized</i>
	<i>AlternativeUserID</i>	<i>M</i>	the process ID as used within the local operating system in the local system logs.
	<i>UserName</i>	<i>U</i>	<i>not specialized</i>
	<i>UserIsRequestor</i>	<i>U</i>	<i>not specialized</i>
	<i>RoleIDCode</i>	<i>M</i>	EV(110153, DCM, “Source”)
	<i>NetworkAccessPointTypeCode</i>	<i>M</i>	“1” for machine (DNS) name, “2” for IP address
	<i>NetworkAccessPointID</i>	<i>M</i>	The machine name or IP address

2005

<b>Human Requestor (if known)</b> AuditMessage/ ActiveParticipant	<i>UserID</i>	<i>M</i>	Identity of the human that initiated the transaction.
	<i>AlternativeUserID</i>	<i>U</i>	<i>not specialized</i>
	<i>UserName</i>	<i>U</i>	<i>not specialized</i>
	<i>UserIsRequestor</i>	<i>U</i>	<i>not specialized</i>
	<i>RoleIDCode</i>	<i>U</i>	Access Control role(s) the user holds that allows this transaction.
	<i>NetworkAccessPointTypeCode</i>	<i>U</i>	<i>not specialized</i>
	<i>NetworkAccessPointID</i>	<i>U</i>	<i>not specialized</i>

<b>Destination</b> AuditMessage/ ActiveParticipant	<i>UserID</i>	<i>C</i>	SOAP endpoint URI
	<i>AlternativeUserID</i>	<i>U</i>	<i>not specialized</i>
	<i>UserName</i>	<i>U</i>	<i>not specialized</i>
	<i>UserIsRequestor</i>	<i>U</i>	<i>not specialized</i>
	<i>RoleIDCode</i>	<i>M</i>	EV(110152, DCM, “Destination”)
	<i>NetworkAccessPointTypeCode</i>	<i>M</i>	“1” for machine (DNS) name, “2” for IP address
	<i>NetworkAccessPointID</i>	<i>M</i>	The machine name or IP address

<b>Audit Source</b> AuditMessage/ AuditSourceIdentification	<i>AuditSourceID</i>	<i>U</i>	<i>not specialized</i>
	<i>AuditEnterpriseSiteID</i>	<i>U</i>	<i>not specialized</i>
	<i>AuditSourceTypeCode</i>	<i>U</i>	<i>not specialized</i>

2010

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<b>Patient (if-known)</b> (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	“1” (Person)
	ParticipantObjectTypeCodeRole	M	“1” (Patient)
	<i>ParticipantObjectDataLifeCycle</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectIDTypeCode</i>	M	<i>not specialized</i>
	<i>ParticipantObjectSensitivity</i>	<i>U</i>	<i>not specialized</i>
	ParticipantObjectID	M	The patient ID in HL7 CX format.
	<i>ParticipantObjectName</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectQuery</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectDetail</i>	<i>U</i>	<i>not specialized</i>

<b>Document</b> (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	“2” (System)
	ParticipantObjectTypeCodeRole	M	“3” (report)
	<i>ParticipantObjectDataLifeCycle</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectIDTypeCode</i>	<i>M</i>	<i>not specialized</i>
	<i>ParticipantObjectSensitivity</i>	<i>U</i>	<i>not specialized</i>
	ParticipantObjectID	M	The value of <ihe:DocumentUniqueId/>
	ParticipantObjectName	C	If known the value of <ihe:HomeCommunityId/>
	<i>ParticipantObjectQuery</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectDetail</i>	<i>U</i>	<i>not specialized</i>

2015 3.54.5.1.2 Document Metadata Notification Broker audit message:

	Field Name	Opt	Value Constraints
<b>Event</b> AuditMessage/ EventIdentification	EventID	M	EV(110107, DCM, “Import”)
	EventActionCode	M	“C” (Create)
	<i>EventDateTime</i>	<i>M</i>	<i>not specialized</i>
	<i>EventOutcomeIndicator</i>	<i>M</i>	<i>not specialized</i>
	EventTypeCode	M	EV(“ITI-54”, “IHE Transactions”, “Document Metadata Publish”)
<b>Source (Document Metadata Publisher) (1)</b>			
<b>Destination (Document Metadata Notification Broker) (1)</b>			
<b>Audit Source (Document Metadata Notification Broker) (1)</b>			
<b>Document (1..n)</b>			

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Where:

<b>Source</b> AuditMessage/ ActiveParticipant	UserID	U	<i>not specialized</i>
	AlternativeUserID	U	<i>not specialized</i>
	UserName	U	<i>not specialized</i>
	UserIsRequestor	U	<i>not specialized</i>
	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

2020

<b>Destination</b> AuditMessage/ ActiveParticipant	UserID	C	SOAP endpoint URI
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	U	<i>not specialized</i>
	UserIsRequestor	U	<i>not specialized</i>
	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

<b>Audit Source</b> AuditMessage/ AuditSourceIdentification	AuditSourceID	U	<i>not specialized</i>
	AuditEnterpriseSiteID	U	<i>not specialized</i>
	AuditSourceTypeCode	U	<i>not specialized</i>

<b>Document URI</b> (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	"2" (System)
	ParticipantObjectTypeCodeRole	M	"3" (report)
	ParticipantObjectDataLifeCycle	U	<i>not specialized</i>
	ParticipantObjectIDTypeCode	M	<i>not specialized</i>
	ParticipantObjectSensitivity	U	<i>not specialized</i>
	ParticipantObjectID	M	The value of <ihe:DocumentUniqueId/>
	ParticipantObjectName	C	If known the value of <ihe:HomeCommunityId/>
	ParticipantObjectQuery	U	<i>not specialized</i>
	ParticipantObjectDetail	U	<i>not specialized</i>

Add Section 3.69

2025



### 3.69 Create Destroy Pull Point

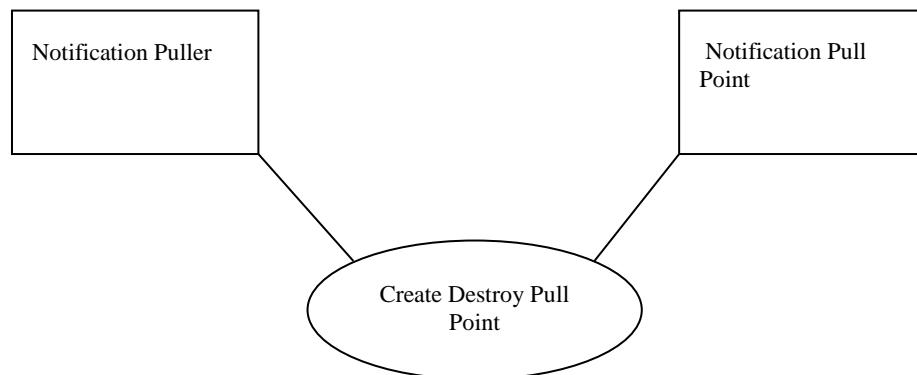
This section corresponds to the Transaction ITI-69 of the IHE IT Infrastructure Technical Framework. Transaction ITI-69 is used by the Notification Puller and by the Notification Pull Point.

2030 **3.69.1 Scope**

This transaction involves a Request by the Notification Puller to the Notification Pull Point to create a Pull Point resource, and a Response to convey the information that the Request was successfully processed. This Response identifies the endpoint where notifications are delivered.

2035 The Notification Puller also uses this transaction to destroy a Pull Point resource which is no longer needed.

#### 3.69.2 Actor Roles



<b>Actor:</b>	Notification Puller
<b>Role:</b>	Sends a request to create (or delete) a Pull Point resource,
<b>Actor:</b>	Notification Pull Point
<b>Role:</b>	Manages the creation or the destruction of the Pull Point resource.

2040

#### 3.69.3 Referenced Standards

- OASIS Web Services Notification Family of standards
- WS-BaseNotification 1.3 OASIS standard

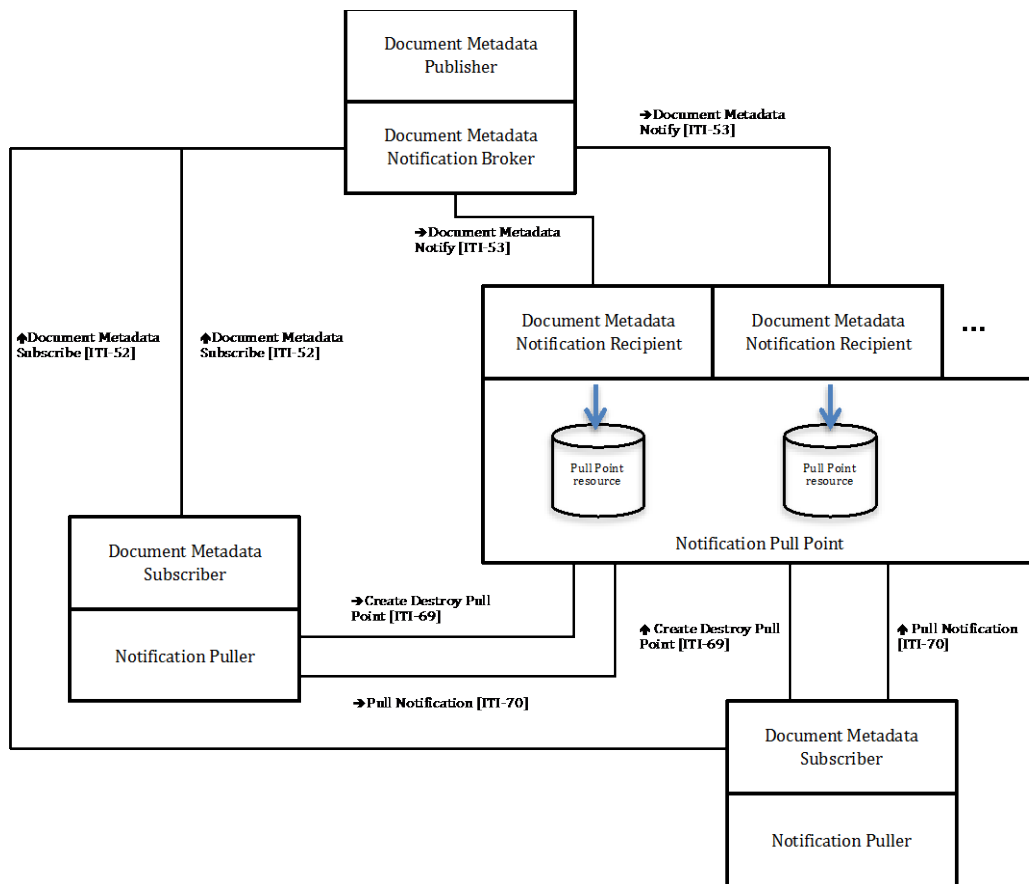


2065 The creation of a Pull Point resource requires grouping the Notification Pull Point with a Document Metadata Notification Recipient for receiving notifications sent by the Document Metadata Notification Broker.

2070 If many Notification Puller actors are involved in the notification system, the Notification Pull Point is grouped with many Document Metadata Notification Recipient actors (see Figure 3.69.4.1-1). When a Notification Puller sends a CreatePullPoint Request message, the Notification Pull Point returns an endpoint in the CreatePullPoint Response message. This endpoint is associated with a Document Metadata Notification Recipient. The Document Metadata Notification Recipient SHALL store in the Pull Point resource the notifications received. This is an additional requirement for a Document Metadata Notification Recipient that is grouped with a Notification Pull Point.

2075 The Notification Puller uses this endpoint for subsequent transactions (subscription requests, pulling of notifications and destroying of the Pull Point resource itself).

The way to store notifications and how to associate notifications to the specific Pull Point resources are not described and are out of scope of this transaction.



2080

**Figure 3.69.4.1-1: Pull-style Notification Framework**

### 3.69.4.1.1 Trigger Events

When the Notification Puller wishes to create a new Pull Point resource, it SHALL send a CreatePullPoint Request to a Notification Pull Point.

### 2085 3.69.4.1.2 Message Semantics

The CreatePullPoint Request shall comply with the requirements in the WS-BaseNotification standard.

This message does not convey information to the Notification Pull Point, but is used only as trigger for internal subsequent actions.

2090 The WS-Addressing [action] Message Addressing Property MUST contain the URI <http://docs.oasis-open.org/wsn/bw-2/CreatePullPoint/CreatePullPointRequest>.

### 3.69.4.1.3 Expected Actions

2095 Upon receipt of the CreatePullPoint Request, the Notification Pull Point SHALL create a new Pull Point resource. The Document Metadata Notification Recipient/Notification Pull Point can act in one of two ways:

1. If the CreatePullPoint Request message is successfully processed, the Notification Pull Point SHALL respond with CreatePullPoint Response message. The behavior of the Notification Pull Point when it is no longer capable of accumulating notifications is out of scope for this profile.
  2. If the Notification Pull Point cannot respond to the CreatePullPoint Request message with the CreatePullPoint Response message for an application-level fault, then it SHALL send a SOAP fault in accordance to the WS-BaseFault specification. The WS-BaseNotification specification defines the following fault associated with failure to process the CreatePullPoint Request message:
    - UnableToCreatePullPointFault.
- 2100
- 2105

### 3.69.4.1.4 Example SOAP Encoding of the CreatePullPoint Request Message

```
<s:Envelope ... >
  <s:Header>
    <wsa:Action>
      http://docs.oasis-open.org/wsn/bw2/PullPoint/CreatePullPointRequest
    </wsa:Action>
    ...
  </s:Header>
  <s:Body>
    <wsnt:CreatePullPoint/>
  </s:Body>
</s:Envelope>
```

### 3.69.4.2 CreatePullPoint Response message

2110 If the Notification Pull Point can create a Pull Point resource dedicated to the specific Notification Puller, the Notification Pull Point SHALL respond to the request received with a CreatePullPoint Response, as described in the WS-BaseNotification standard.

#### 3.69.4.2.1 Trigger Events

2115 This message is created in response to a request of creation of a Pull Point resource that is successfully processed. The Response message can be created once the endpoint of the Pull Point resource is identified.

#### 3.69.4.2.2 Message Semantics

The CreatePullPoint Response shall comply with the requirements in the WS-BaseNotification standard.

2120 This message, “The WS-Addressing [action] Message Addressing Property”, SHALL contain the URI:

<http://docs.oasis-open.org/wsn/bw-2/CreatePullPoint/CreatePullPointResponse>.

The CreatePullPoint response message SHALL contain the attribute:  
/wsnt:CreatePullPointResponse/wsnt:PullPoint.

- 2125
- This component is an EndpointReference, as defined by WS-Addressing, which is a reference to the Pull Point resource created during the processing of the CreatePullPoint Request message.
  - This SHALL be the Web-Service endpoint for the Document Metadata Notify transaction [ITI-53] on the Document Metadata Notification Recipient that is grouped with the Notification Pull Point.
- 2130

#### 3.69.4.2.3 Expected Actions

2135 The CreatePullPoint Response message provides to the Notification Puller the endpoint needed for creating subscriptions to the Document Metadata Notification Broker. The same endpoint SHALL be used for the pulling of the notification stored by the Notification Pull Point and/or the destroying of the Pull Point resource itself as needed using this transaction.

#### 3.69.4.2.4 Example SOAP Encoding of the CreatePullPoint Response Message

```
<s:Envelope ... >
  <s:Header>
    <wsa:Action>
      http://docs.oasis-open.org/wsn/bw-2/PullPoint/CreatePullPointResponse
    </wsa:Action>
    ...
  </s:Header>
```

```
<s:Body>
  <wsnt:CreatePullPointResponse>
    <wsnt:PullPoint>
      <wsa:Address>...</wsa:Address>
      ...
    </wsnt:PullPoint>
  </wsnt:CreatePullPointResponse>
</s:Body>
</s:Envelope>
```

### 3.69.4.3 DestroyPullPoint Request message

2140 If the Notification Puller wants to terminate the Pull Point resource it SHALL send a DestroyPullPoint Request message. The request of destruction is directly targeted to the endpoint of reference that identifies the Pull Point resource and the grouped Notification Pull Point/Document Metadata Notification Recipient.

#### 3.69.4.3.1 Trigger Events

2145 This message is created when the Notification Puller does not want to be involved in a notification system, or when it is necessary to remove a Pull Point resource for organizational reasons. The Document Metadata Subscriber grouped with the Notification Puller starts the process for unsubscribe filters created using the Pull Point resource endpoint as target for notifications created before to start the destruction.

#### 2150 3.69.4.3.2 Message Semantics

The DestroyPullPoint Request shall comply with the requirements in the WS-BaseNotification standard. The WS-Addressing [action] Message Addressing Property SHALL contain the URI: <http://docs.oasis-open.org/wsn/bw-2/PullPoint/DestroyPullPointRequest>.

#### 3.69.4.3.3 Expected Actions

2155 If the DestroyPullPoint Request is successfully processed, once this message is received by the Notification Pull Point, the Pull Point resource SHALL attempt to destroy itself, responding with the DestroyPullPoint Response message. The Pull Point SHALL discard all queued notifications.

2160 If the Notification Pull Point does not respond to the DestroyPullPoint Request message with the DestroyPullPointResponse message, then it SHALL send a fault. The WS-BaseNotification specification defines the following faults associated with failure to process the DestroyPullPoint Request message:

1. If the Pull Point resource identified in the DestroyPullPoint Request message is not known to the Notification Pull Point, it SHALL send a fault specified by the WS-Resource [WS-Resource] specification:

2165 

- ResourceUnknownFault

2. If the Notification Pull Point was unable to destroy the Pull Point resource for some reason, it SHALL send a fault specified by the WS-BaseNotification specification:
  - UnableToDestroyPullPointFault.

2170 **3.69.4.3.4 Example SOAP Encoding of the DestroyPullPoint Request Message**

```
<s:Envelope ... >
  <s:Header>
    <wsa:Action>http://docs.oasis-open.org/wsn/bw-2/PullPoint/DestroyPullPointRequest
  </wsa:Action>
  ...
</s:Header>
<s:Body>
  <wsnt:DestroyPullPoint/>
</s:Body>
</s:Envelope>
```

**3.69.4.4 DestroyPullPoint Response message**

2175 The Notification Pull Point responds to the Notification Puller creating a DestroyPullPoint Response that attests to the success of the destruction process.

**3.69.4.4.1 Trigger Events**

If the DestroyPullPoint Request message is successfully processed, the Notification Pull Point SHALL respond with the DestoryPullPoint Response message.

**3.69.4.4.2 Message Semantics**

2180 The DestroyPullPoint Response shall comply with the requirements in the WS-BaseNotification standard. The WS-Addressing [action] Message Addressing Property SHALL contain the URI: <http://docs.oasis-open.org/wsn/bw-2/PullPoint/DestroyPullPointResponse>.

**3.69.4.4.3 Expected Actions**

The Notification Puller should discard the endpoint of the Pull Point resources.

2185 **3.69.4.4.4 Example SOAP Encoding of the DestroyPullPoint Response Message**

```
<s:Envelope ... >
  <s:Header>
    <wsa:Action>
      http://docs.oasis-open.org/wsn/bw-
```

```
2/PullPoint/DestroyPullPointResponse
  </wsa:Action>
  ...
  </s:Header>
  <s:Body>
    <wsnt:DestroyPullPointResponse/>
  </s:Body>
</s:Envelope>
```

### 3.69.5 Security Considerations

2190 This section addresses security considerations related to the Create Destroy Pull Point transaction.

The risks connected to this transaction are:

2195 Authentication of the Notification Puller is required. This avoids requests made by not reputable actors. The endpoint has to be used by the Puller for the creation of subscriptions that can be sent to a recognized Notification Recipient. If the authentication of the Puller was not required, the notifications will be sent anyway to the grouped Notification Pull Point, because the Broker recognizes as a reputable actor the Document Metadata Notification Recipient.

- Mitigation:
  - 2200 • Node Authentication using ATNA: to assure that the requesting system is an authorized requesting system.
  - User authentication using XUA: when it is necessary to know who the user is.

#### 3.69.5.1 Security Audit Considerations

2205 If a Request of creation of Pull Point or a Request of destruction is processed, the Notification Pull Point and Notification Puller SHALL create an Audit Record in accordance to the structure defined below. These events are of type “Application Activity”.

##### 3.69.5.1.1 Notification Pull Point audit message



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Real World Entities	Field Name	Opt.	Value Constraints
<b>Event</b>	EventID	M	EV (110100, DCM, "Application Activity")
	EventActionCode	M	Enumerated Value <b>C = Create</b> (in case of creation of the Pull Point) or <b>D= Delete</b> (in case of deletion of the Pull Point)
	EventDateTime	M	time of creation or deletion of the Pull Point resource
	<i>EventOutcomeIndicator</i>	<i>M</i>	<i>not specialized</i>
	EventTypeCode	M	EV("ITI-69", "IHE Transactions", "Create Destroy Pull Point")
Source (Notification Puller) (1)			
Destination (Notification Pull Point ) (1)			
Pull Point (1)			
Human Requestor (0..1)			

2210

<b>Source:</b> AuditMessage/ ActiveParticipant (1)			
	<i>UserID</i>	<i>U</i>	<i>not specialized</i>
	<i>AlternativeUserID</i>	<i>U</i>	<i>not specialized</i>
	<i>UserName</i>	<i>U</i>	<i>not specialized</i>
	<i>UserIsRequestor</i>	<i>U</i>	<i>not specialized</i>
	RoleIDCode	M	EV (110153, DCM, "Source")
	NetworkAccessPointType Code	U	"1" for machine (DNS) name "2" for IP address
	NetworkAccessPointID	U	The machine name or IP address

<b>Destination:</b> AuditMessage/ ActiveParticipant (1)			
	UserID	M	Metadata Notification Pull Point SOAP URI
	AlternativeUserID	U	the process ID as used within the local operating system in the local system of logs
	<i>UserName</i>	<i>U</i>	<i>not specialized</i>
	<i>UserIsRequestor</i>	<i>U</i>	<i>not specialized</i>
	RoleIDCode	M	EV (110152, DCM, "Destination")
	NetworkAccessPointType Code	U	"1" for machine (DNS) name "2" for IP address
	NetworkAccessPointID	U	The machine name or IP address

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<b>Human Requestor</b> (if known) AuditMessage/Active Participant	UserID	M	The person who wants to create (or destroying) a Pull Point resource
	AlternativeUserID	U	not specialized
	UserName	U	not specialized
	UserIsRequestor	U	not specialized
	RoleIDCode	M	not specialized
	NetworkAccessPointTypeCode	U	not specialized
	NetworkAccessPointID	U	not specialized

<b>Pull Point</b> (AuditMessage/ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	“2” (SYSTEM)
	ParticipantObjectTypeRole	M	“4” (Resource)
	ParticipantObjectDataLifecycle	U	not specialized
	ParticipantObjectIDTypeCode	M	not specialized
	ParticipantObjectSensitivity	U	not specialized
	ParticipantObjectID	M	The URL of the Pull Point resource
	ParticipantObjectName	U	not specialized
	ParticipantObjectQuery	U	not specialized
	ParticipantObjectDetail	U	not specialized

### 3.69.5.1.2 Notification Puller audit message

Real World Entities	Field Name	Opt.	Value Constraints
<b>Event</b>	EventID	M	EV (110100, DCM, "Application Activity")
	EventActionCode	M	Enumerated Value <b>C = Create</b> (in case of creation of the Pull Point) or <b>D= Delete</b> (in case of deletion of the Pull Point)
	EventDateTime	M	time of creation or deletion of the Pull Point resource
	EventOutcomeIndicator	M	not specialized
	EventTypeCode	M	EV("ITI-69", "IHE Transactions", "Create Destroy Pull Point")
Source (Notification Puller) (1)			
Destination (Notification Pull Point ) (1)			
Pull Point (1)			
Human Requestor (0..1)			

2220

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<b>Source:</b> AuditMessage/ ActiveParticipant	<i>UserID</i>	<i>U</i>	<i>not specialized</i>
	<i>AlternativeUserID</i>	<i>U</i>	<i>not specialized</i>
	<i>UserName</i>	<i>U</i>	<i>not specialized</i>
	<i>UserIsRequestor</i>	<i>U</i>	<i>not specialized</i>
	<i>RoleIDCode</i>	<i>M</i>	EV (110153, DCM, "Source")
	<i>NetworkAccessPointTypeCode</i>	<i>U</i>	"1" for machine (DNS) name "2" for IP address
	<i>NetworkAccessPointID</i>	<i>U</i>	The machine name or IP address

<b>Destination:</b> AuditMessage/ ActiveParticipant (1)	<i>UserID</i>	<i>M</i>	Metadata Notification Pull Point SOAP URI
	<i>AlternativeUserID</i>	<i>U</i>	<i>not specialized</i>
	<i>UserName</i>	<i>U</i>	<i>not specialized</i>
	<i>UserIsRequestor</i>	<i>U</i>	<i>not specialized</i>
	<i>RoleIDCode</i>	<i>M</i>	EV (110152, DCM, "Destination")
	<i>NetworkAccessPointTypeCode</i>	<i>U</i>	"1" for machine (DNS) name "2" for IP address
	<i>NetworkAccessPointID</i>	<i>U</i>	The machine name or IP address

<b>Human Requestor</b> (if known) AuditMessage/Active Participant	<i>UserID</i>	<i>M</i>	The person that wants to create (or destroying) a Pull Point resource
	<i>AlternativeUserID</i>	<i>U</i>	<i>not specialized</i>
	<i>UserName</i>	<i>U</i>	<i>not specialized</i>
	<i>UserIsRequestor</i>	<i>U</i>	<i>not specialized</i>
	<i>RoleIDCode</i>	<i>M</i>	<i>not specialized</i>
	<i>NetworkAccessPointTypeCode</i>	<i>U</i>	<i>not specialized</i>
	<i>NetworkAccessPointID</i>	<i>U</i>	<i>not specialized</i>

<b>Pull Point</b> (AuditMessage/ParticipantObjectIdentification)	<i>ParticipantObjectTypeCode</i>	<i>M</i>	"2" (SYSTEM)
	<i>ParticipantObjectTypeCodeRole</i>	<i>M</i>	"4" (Resource)
	<i>ParticipantObjectDataLifeCycle</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectIDTypeCode</i>	<i>M</i>	<i>not specialized</i>
	<i>ParticipantObjectSensitivity</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectID</i>	<i>M</i>	The URL of the Pull Point resource
	<i>ParticipantObjectName</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectQuery</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectDetail</i>	<i>U</i>	<i>not specialized</i>

### 3.69.5.1.3 Notification Pull Point Actor Specific Security Considerations

For the receiving of notifications pushed by the Document Metadata Notification Broker, the grouped Document Metadata Notification Recipient/Notification Pull Point has to grant the requirement of Synchronous Web Services described in ITI TF-2x: Appendix V.

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*Add Section 3.70*

## 3.70 Pull Notification

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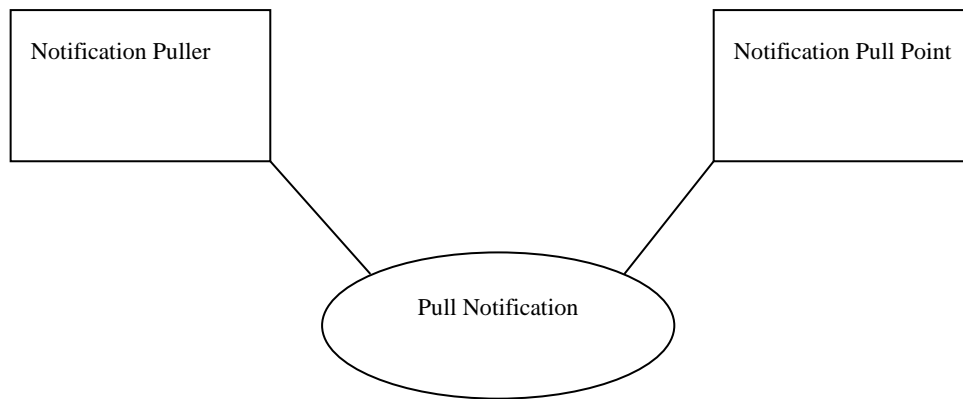
This section corresponds to the Transaction ITI-70 of the IHE IT Infrastructure Technical Framework. Transaction ITI-70 is used by the Notification Puller and by the Notification Pull Point actors.

### 3.70.1 Scope

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The Pull Notification transaction provides a message exchange to allow a Notification Puller to retrieve (or pull) notification messages from a Notification Pull Point. This transaction involves a Request by the Notification Puller for the retrieving of messages from Notification Pull Point and a response conveying pending notifications targeted to the Notification Puller.

### 3.70.2 Actor Roles



<b>Actor:</b>	Notification Puller
<b>Role:</b>	Sends a request to the Notification Pull Point for pending notifications stored in a Pull Point resource.

<b>Actor:</b>	Notification Pull Point
<b>Role:</b>	Responds to the request to deliver pending messages for the Notification Puller.

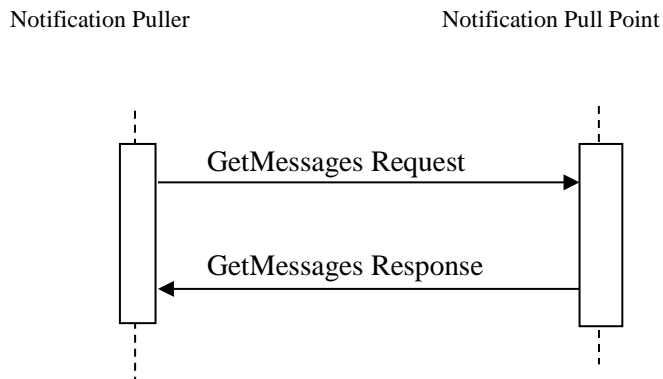
2245

### 3.70.3 Referenced Standards

- OASIS Web Services Notification Family of standards
- WS-BaseNotification 1.3 OASIS standard
- WS-BrokeredNotification 1.3 OASIS Standard
- WS-BaseFaults
- WS-Topics 1.3 OASIS Standard
- IHE ITI TF-2x: Appendix V
- WS-Addressing OASIS Standard

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### 3.70.4 Interaction Diagram



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#### 3.70.4.1 GetMessages Request message

The Notification Puller asks for pending notifications on the Notification Pull Point using the endpoint obtained after the creation of the Pull Point resource.

##### 3.70.4.1.1 Trigger Events

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If the Notification Puller wishes to retrieve pending notifications from the Pull Point resource, it SHALL send a GetMessages request to the endpoint returned in the response to the Create Destroy Pull Point transaction [ITI-69].

### 3.70.4.1.2 Message Semantics

2265 The GetMessages Request SHALL comply with the requirements in the WS-BaseNotification standard.

This is a request message to the Notification Pull Point that allows the pulling of pending notifications.

The WS-Addressing [action] Message Addressing Property MUST contain the URI:

<http://docs.oasis-open.org/wsn/bw-2/PullPoint/GetMessagesRequest>.

2270 The components of the GetMessages request are:

- 2275 • **/wsnt:GetMessages:** This component, which is required, requests that notifications held by the Pull Point resource be returned. Once the GetMessages message is received by the Metadata Notification Pull Point the request message is processed. The Pull Point shall respond to the Notification Puller immediately when the request is processed, returning content stored at that time without waiting for other notifications to be accumulated.
- 2280 • **/wsnt:GetMessages/wsnt:MaximumNumber:** This non-negative integer that indicates the maximum number of accumulated Notification Messages to be returned in the response message. This element is default set to “1”. This requirement is related to auditing reasons and allows that Response messages convey data related to only one patient.

### 3.70.4.1.3 Expected Actions

Once the GetMessages Request message is received by the Notification Pull Point, it processes the request message. There are three possibilities:

- 2285 1. ***The Notification Pull Point resource has no notifications messages stored.*** The Notification Pull Point SHALL respond with a GetMessages Response message containing zero Notification Response Messages
- 2290 2. ***The Notification Pull Point resource has one notification messages stored.*** The Notification Pull Point SHALL respond with a GetMessage Response containing only one Notification Message into a GetMessages Response message.
3. ***The Notification Pull Point resource stores more than one message.*** The Response message convey only one notification message but the Notification Puller is required to start another Notification Pull transaction in order to retrieve all notifications.
- 2295 4. ***The Pull Point resource is unable to respond to the request.*** The Notification Pull Point SHALL send one of these faults:
  - ResourceUnknownFault - The Pull Point resource is acting as a WS-Resource, and the resource identified in the request message is not known to the Web service. This fault is specified by the WS-Resource [WS-Resource] specification.

UnableToGetMessagesFault -The Notification Pull Point cannot return notifications messages for some unspecified reasons

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#### 3.70.4.1.4 Example SOAP Encoding of the GetMessages Request message

```
<s:Envelope ... >
  <s:Header>
    <wsa:Action>
      http://docs.oasis-open.org/wsn/bw-2/PullPoint/GetMessagesRequest
    </wsa:Action>
    ...
  </s:Header>
  <s:Body>
    <wsnt:GetMessages>
      <wsnt:MaximumNumber>1</wsnt:MaximumNumber>
    </wsnt:GetMessages>
  </s:Body>
</s:Envelope>
```

#### 2305 3.70.4.2 GetMessages Response message

If the Notification Pull Point can process the request, it SHALL respond to the request received with a GetMessages Response, as described in the WS-BaseNotification standard.

##### 3.70.4.2.1 Trigger Events

2310 This message is created in response to a request of retrieving of notification messages stored in a specific Pull Point resource. A Pull Point resource is related to one Notification Puller.

##### 3.70.4.2.2 Message Semantics

The WS-Addressing [action] element of the response of the GetMessages request message MUST contain the URI:

<http://docs.oasis-open.org/wsn/bw-2/PullPoint/GetMessagesResponse>.

2315 The contents of the GetMessages response message are further described as follows:

- **/wsnt:GetMessagesResponse**: This component contains one Notification Message. The number of messages appearing is limited by the wsnt:MaximumNumber component of the GetMessages request message (that SHALL be equal to 1). The Notification Message appearing in a GetMessagesResponse is “removed” from the PullPoint and SHALL NOT appear in the response message of subsequent GetMessages requests.
  - **/wsnt:GetMessagesResponse/wsnt:NotificationMessage**: The content of this component is a Notification Message. The Notification Message component is described
- 2320

2325 as part of the Notify message defined in the Document Metadata Notify transaction [ITI-53]. The GetMessageResponse message does not define additional constraints on the Notification Message component. The content of the Notification Message is exactly the content of the Notification Message component of the accumulated Notify messages using the Document Metadata Notify [ITI-53] transaction.

2330 There shall be a single wsnt:Notify/wsnt:NotificationMessage/wsnt:Message element in this transaction. If multiple objects need to be represented in a single notification, the WS-BaseNotification standard allows this to be done.

#### 3.70.4.2.3 Expected Actions

2335 The Notification Puller SHALL accept the GetMessageResponse message and SHALL be able to manage the Notify Message contained in the response according to the configuration and business logic of the actor. Possibilities include conveying the notification information to other systems and/or users.

#### 3.70.4.2.4 Example SOAP Encoding of the GetMessage Response Message

```
<s:Envelope ... >
  <s:Header>
    <wsa:Action>
      http://docs.oasis-open.org/wsn/bw-2/PullPoint/GetMessagesResponse
    </wsa:Action>
    ...
  </s:Header>
  <s:Body>
    <wsnt:GetMessagesResponse>
      <wsnt:NotificationMessage>
        ...
      </wsnt:NotificationMessage>
    </wsnt:GetMessagesResponse>
  </s:Body>
</s:Envelope>
```

#### 3.70.5 Security Considerations

2340 Notification Puller and Notification Pull Point actors are required to log a "query" event associated to the Pull Notification transaction. The use of encrypted TLS is recommended when the transmission is not otherwise secured (e.g., transmission over a secure network)

2345 Additionally, it is recommended that the Notification Pull transaction be associated with a SAML assertion so that the Notification Puller can outline authorizations to access the notification content (for example, see the XUA Profile ITI TF-1: 13). Only the Notification Puller that has created the Pull Point resource can ask it for pulling notification messages stored.



### 3.70.5.1 Security Audit Considerations

2350 The Pull Notification transaction is a Query 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 Part 15 “Query” because the GetMessages Request message allows the Notification Puller to query for instances stored in the Pull Point resource.

#### 3.70.5.1.1 Notification Puller audit message

2355 The Notification Puller MUST send an audit message for each document conveyed in the notificationMessage element of the GetMessage Response message.

	Field Name	Opt	Value Constraints
<b>Event</b> AuditMessage/ EventIdentification	EventID	M	EV(110112, DCM, “Query”)
	EventActionCode	M	“E” (Execute)
	EventDateTime	M	not specialized
	EventOutcomeIndicator	M	not specialized
	EventTypeCode	M	EV(“ITI-70”, “IHE Transactions”, “Pull Notification”)
<b>Source (Notification Puller) (1)</b>			
<b>Human Requestor (0..1)</b>			
<b>Destination (Notification Pull Point) (1)</b>			
<b>Patient (0..1)</b>			
<b>document (1)</b>			

Where:

<b>Source</b> AuditMessage/ActiveP articipant	UserID	U	not specialized
	AlternativeUserID	M	The process ID as used within the local operating system in the local system logs.
	UserName	U	not specialized
	UserIsRequestor	U	not specialized
	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

<b>Human Requestor (f known)</b> AuditMessage/ ActiveParticipant	UserID	M	Identity of the human that initiated the transaction.
	AlternativeUserID	U	not specialized
	UserName	U	not specialized
	UserIsRequestor	U	not specialized

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	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.
	NetworkAccessPointTypeCode	U	not specialized
	NetworkAccessPointID	U	not specialized

<b>Destination</b> AuditMessage/ ActiveParticipant	UserID	M	SOAP endpoint URL.
	AlternativeUserID	U	not specialized
	UserName	U	not specialized
	UserIsRequestor	U	not specialized
	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

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<b>Patient</b> AuditMessage/ ActiveParticipant	ParticipantObjectTypeCode	M	"1" (Person)
	ParticipantObjectTypeCodeRole	M	"1" (Patient)
	ParticipantObjectDataLifeCycle	U	not specialized
	ParticipantObjectIDTypeCode	M	not specialized
	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

<b>Document</b> AuditMessage/ ActiveParticipant	ParticipantObjectTypeCode	M	"2" (system object)
	ParticipantObjectTypeCodeRole	M	"1" (Patient)
	ParticipantObjectDataLifeCycle	U	not specialized
	ParticipantObjectIDTypeCode	M	EV("ITI-70", "IHE Transactions", Pull Notification")
	ParticipantObjectSensitivity	U	not specialized
	ParticipantObjectID	M	The value of <ihe:DocumentUniqueID>
	ParticipantObjectName	C	If known the value of <ihe:HomeCommunityID/>
	ParticipantObjectQuery	M	not specialized
		ParticipantObjectDetail	C

### 3.70.5.1.2 Notification Pull Point audit message

	Field Name	Opt	Value Constraints
<b>Event</b> AuditMessage/ EventIdentification	EventID	M	EV(110112, DCM, "Query")
	EventActionCode	M	"E" (Execute)
	EventDateTime	M	not specialized
	EventOutcomeIndicator	M	not specialized
	EventTypeCode	M	EV("ITI-70", "IHE Transactions", "Pull Notification")
<b>Source (Notification Puller) (1)</b>			
<b>Human Requestor (0..1)</b>			
<b>Destination (Notification Pull Point) (1)</b>			
<b>Patient (0..1)</b>			
<b>document (1)</b>			

2365

Where:

<b>Source</b> AuditMessage/ ActiveParticipant	UserID	U	not specialized
	AlternativeUserID	M	The process ID as used within the local operating system in the local system logs.
	UserName	U	not specialized
	UserIsRequestor	U	not specialized
	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

<b>Human Requestor (if known)</b> AuditMessage/ ActiveParticipant	UserID	M	Identity of the human that initiated the transaction.
	AlternativeUserID	U	not specialized
	UserName	U	not specialized
	UserIsRequestor	U	not specialized
	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.
	NetworkAccessPointTypeCode	U	not specialized
	NetworkAccessPointID	U	not specialized

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<b>Destination</b> AuditMessage/ ActiveParticipant	UserID	M	SOAP endpoint URI.
	<i>AlternativeUserID</i>	<i>U</i>	<i>not specialized</i>
	<i>UserName</i>	<i>U</i>	<i>not specialized</i>
	<i>UserIsRequestor</i>	<i>U</i>	<i>not specialized</i>
	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

<b>Patient</b> AuditMessage/ ActiveParticipant	ParticipantObjectTypeCode	M	“1” (Person)
	ParticipantObjectTypeCodeRole	M	“1” (Patient)
	<i>ParticipantObjectDataLifeCycle</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectIDTypeCode</i>	<i>M</i>	<i>not specialized</i>
	<i>ParticipantObjectSensitivity</i>	<i>U</i>	<i>not specialized</i>
	ParticipantObjectID	M	The patient ID in HL7 CX format.
	<i>ParticipantObjectName</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectQuery</i>	<i>U</i>	<i>not specialized</i>
<i>ParticipantObjectDetail</i>	<i>U</i>	<i>not specialized</i>	

<b>Document</b> AuditMessage/ ActiveParticipant	ParticipantObjectTypeCode	M	“2” (system object)
	ParticipantObjectTypeCodeRole	M	“1” (Patient)
	<i>ParticipantObjectDataLifeCycle</i>	<i>U</i>	<i>not specialized</i>
	ParticipantObjectIDTypeCode	M	EV(“ITI-70”, “IHE Transactions”, “Pull Notification”)
	<i>ParticipantObjectSensitivity</i>	<i>U</i>	<i>not specialized</i>
	ParticipantObjectID	M	The value of <ihe:DocumentUniqueID>
	ParticipantObjectName	C	If known the value of <ihe:HomeCommunityID/>
	<i>ParticipantObjectQuery</i>	<i>M</i>	<i>not specialized</i>
<i>ParticipantObjectDetail</i>	<i>C</i>	<i>not specialized</i>	

### 2375 3.70.5.1.3 Metadata Notification Pull Point Specific Security Considerations

Notifications stored in the Pull Point should be managed in a secure way, but modalities to do this are not constrained by this supplement. The Pull Point resource is directly related to one Metadata Notification Puller. A system for the management of access policies can be created over this actor but these topics are not addressed by transactions.