

**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**

20      Date:            September 20, 2013  
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## Foreword

25 This is a supplement to the IHE IT Infrastructure Technical Framework V10.0. Each supplement undergoes a process of public comment and trial implementation before being incorporated into the volumes of the Technical Frameworks.

30 This supplement is published on September 20, 2013 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 [http://www.ihe.net/ITI\\_Public\\_Comments](http://www.ihe.net/ITI_Public_Comments).

35 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”;
- a new supplement developed by the ITI Technical Committee with name “Pull-Style Notification”;
- updates associated to a series of CPs approved during the 2012/2013 cycle: CP-610-00, CP-611-01, CP-647-01.

40 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, 45 26.4.5, and 26.4.6).
- 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 50 submissionSet metadata (section 3.52.5.2).
- 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.
- Definition of two new actors: Notification Pull Point and Notification Puller. These 55 actors are grouped with other DSUB actors (respectively Document Metadata Notification Recipient actor and Document Metadata Subscriber actor).

- 60
- 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.
  - Removal of the publish and subscribe infrastructure section 4.4 vol.3.

This supplement describes changes to the existing technical framework documents.

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

*Amend section X.X by the following:*

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

General information about IHE can be found at: <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).

75       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

- 170 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.
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.
- 175 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 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.
- 180
2. In the “Pull-style” method, a Notification Puller actor creates a Pull Point resource able to store notification generated by the Document Metadata Notification Broker actor. This Pull Point resource is a resource managed by the Pull Point actor that allows the storing of notification targeted to a specific recipient. Notifications stored in the Pull Point actor can be retrieved by the Notification Puller actor using a specific transaction.
- 185
- 190
- 195

## General Introduction

### Appendix A - Actor Summary Definitions

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

200

| Actor   | Definition   |
|---|--|
| <b>Document Metadata Subscriber</b>             | The Document Metadata Subscriber actor 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 actor. In a cross-community environment, the subscriber will most likely be grouped with an Initiating Gateway actor.   |
| <b>Document Metadata Publisher</b>              | The Document Metadata Publisher actor sends a Document Metadata Publish transaction to the Document Metadata Notification Broker for any event for which a subscription exists. Within an XDS Affinity Domain, the Document Metadata Publisher actor will most likely be grouped with a Document Registry actor.   |
| <b>Document Metadata Notification Recipient</b> | The Document Metadata Notification Recipient actor 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. In a cross-community environment the Document Metadata Notification Recipient will most likely be grouped with a Responding Gateway actor.   |
| <b>Document Metadata Notification Broker</b>    | 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 actor. In a cross-community environment, this actor will most likely be grouped with Initiating and Responding Gateway actors. |
| <b>Notification Pull Point</b>                  | 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.  |
| <b>Notification Puller</b>                      | 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 actor when requested.  |

### Appendix B - Transaction Summary Definitions

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

205

| Transaction                                | Definition  |
|--|---|
| <b>ITI- 52 Document Metadata Subscribe</b> | 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 actor can cancel a subscription, as long as it has the subscription id. The subscription request shall specify whether a <u>document</u> full notification, <u>a document</u> minimal notification, <u>a folder metadata notification</u> , or <u>a submissionSet metadata notification</u> will be sent when there is a match to the subscription's filter. |
| <b>ITI-53 Document Metadata Notify</b>     | 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.  |
| <b>ITI-54 Document Metadata Publish</b>    | 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.  |
| <b>ITI-69 Create Destroy Pull Point</b>    | 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.  |
| <b>ITI-70 Notification Pull:</b>           | This transaction is used to retrieve pending notifications.   |

## Glossary

210

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

| Glossary Term                 | Definition  |
|-------------------------------|---|
| <b>Notification Broker</b>    | 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. |
| <b>Publisher</b>              | 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.  |
| <b>Subscriber</b>             | 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.  |
| <b>Notification Recipient</b> | a system or a module in a publish/subscribe framework, the purpose of which is to receive and process notifications from the notification broker.   |
| <b>Pull Point resource</b>    | is a resource managed by the Pull Point actor that allows the storing of notification targeted to a specific recipient.   |

# Volume 1 – Integration Profiles

## 1.7 History of Annual Changes

215 *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

220 *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

225 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.

230 *Add Section 26*

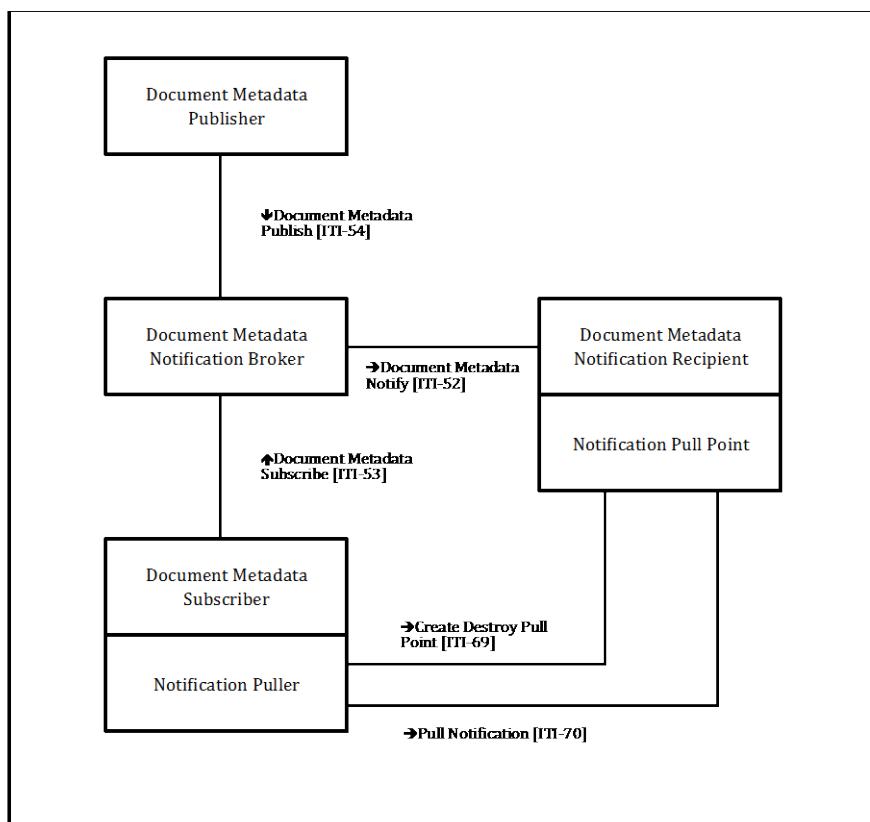
## 26 Document Metadata Subscription Integration Profile

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:

- 240 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.
- 245 2. In the “Pull-style” method, a Notification Puller actor creates a Pull Point resource able to store notification generated by the Document Metadata Notification Broker actor. This Pull Point resource is a resource managed by the Pull Point actor that allows the storing of notification targeted to a specific recipient. Notifications stored in the Pull Point actor can be retrieved by the Notification Puller actor using a specific transaction.

## 26.1 DSUB Actors and Transactions

250 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.



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

255 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.

260

**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 |

### 26.1.1 Actor Descriptions and Actor Profile Requirements

265 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

270 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.

### **26.1.1.2 Document Metadata Subscriber**

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

### **26.1.1.3 Document Metadata Publisher**

280 The Document Metadata Publisher actor sends a Document Metadata Publish transaction to the Document Metadata Notification Broker for any event for which a subscription exists. This profile does not specify how the Document Metadata Publisher becomes aware of new documents becoming available.

### **26.1.1.4 Document Metadata Notification Recipient**

The Document Metadata Notification Recipient actor 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 actor using the Create Destroy Pull Point transaction [ITI-69] to create (and destroy) the Pull Point resource.

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

290 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 actor (grouped with the Document Metadata Notification Recipient) returns the endpoint of the Pull Point resource. The Notification Puller/Document Metadata Subscriber now knows from 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 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 Notification Pull Point/Document Metadata Notification Recipient to retrieve notifications it subscribed to.

300 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

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

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

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

- 315
  - 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**

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 actor) and is used to collect all notifications destined for the requesting Notification Puller actor.

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

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

In order to not lose nor duplicate notifications:

- 330
  - After the creation of a Pull Point resource, the Notification Pull Point actor receives and stores all notifications in the target Pull Point resource. The Notification Puller actor can then retrieve the notifications stored in a target Pull Point resource.
  - Notifications returned to the Notification Puller actor are deleted from the Pull Point resource in accordance to the WS-BaseNotification standard.

If the Notification Pull Point actor 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 actor involved in the notification system.
- The endpoints of these Pull Point resources need to be disclosed to the correct Notification Puller actor.

340 **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.

**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 |
| Document Metadata Subscriber             | <i>No options defined</i>           | --               |
| Document Metadata Publisher              | <i>No options defined</i>           | --               |
| Document Metadata Notification Recipient | <i>No options defined</i>           | --               |

345 **26.2.1 Document Metadata Publish Recipient Option**

The Document Metadata Notification Broker actor that supports this option shall accept and process Document Metadata Publish transactions, representing applicable events for which there may be valid subscriptions.

**26.2.2 Folder Subscription Option**

- 350 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 actor will maintain status of existing folders rather than making GetFolders queries [ITI-18] to determine folder status.
- 355

**26.3 DSUB Required Actor Groupings**

- 360 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 |

| DSUB Actor                               | Profile/Actor to be grouped with                | Reference     |
|--|---|---------------|
| 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

### 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.

- 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
  - a system is unable or unwilling to provide an endpoint to which the Document Metadata Notification Broker can send notifications.
- The use-cases below describe both of these scenarios.

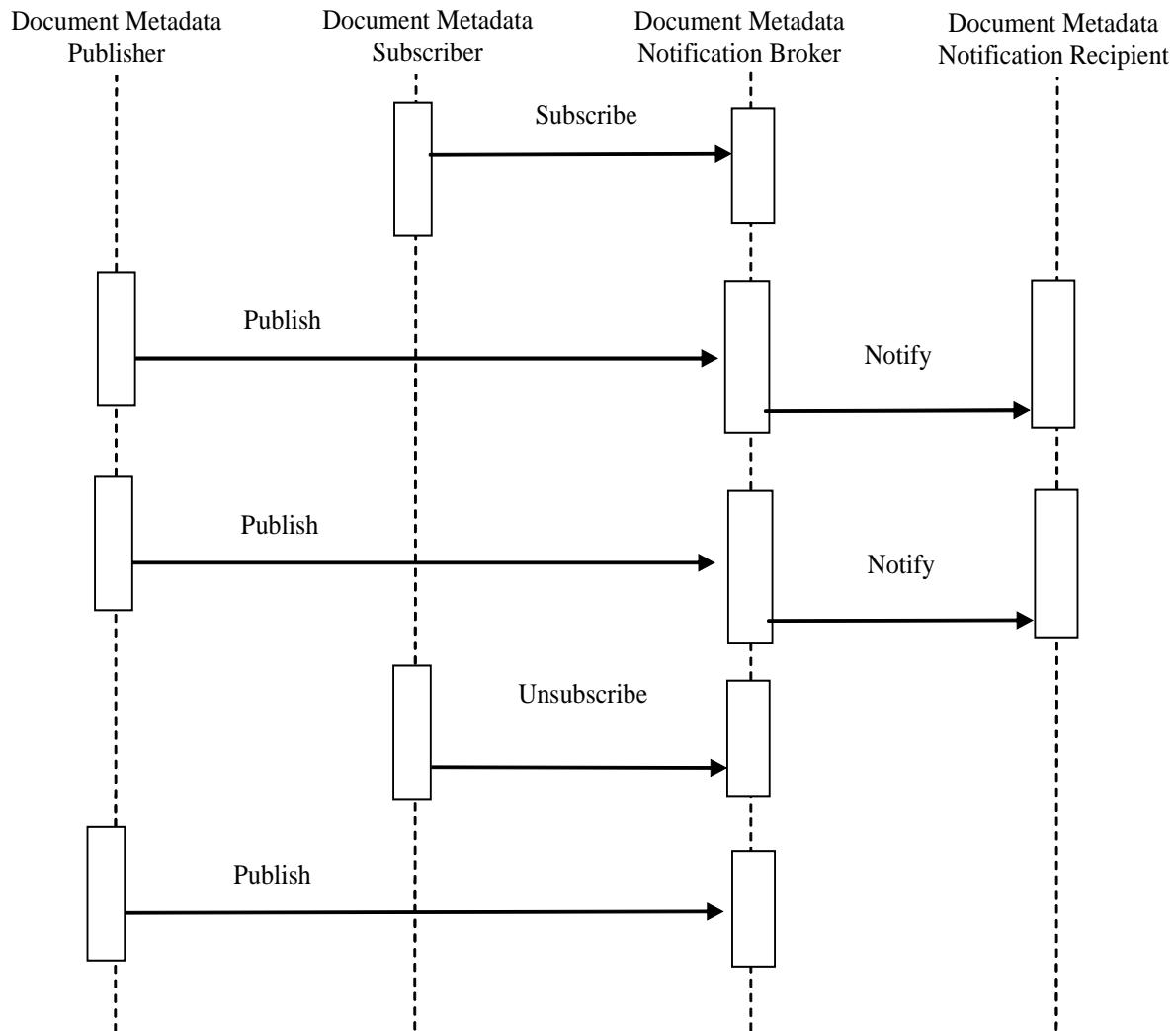
## **26.4.2 Use Cases**

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

#### **380 26.4.2.1.1 Unexpected Notification Use Case Description**

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  
385 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 the care of the emergency department's institution.

#### 26.4.2.1.2 Unexpected Notification Process Flow



390

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

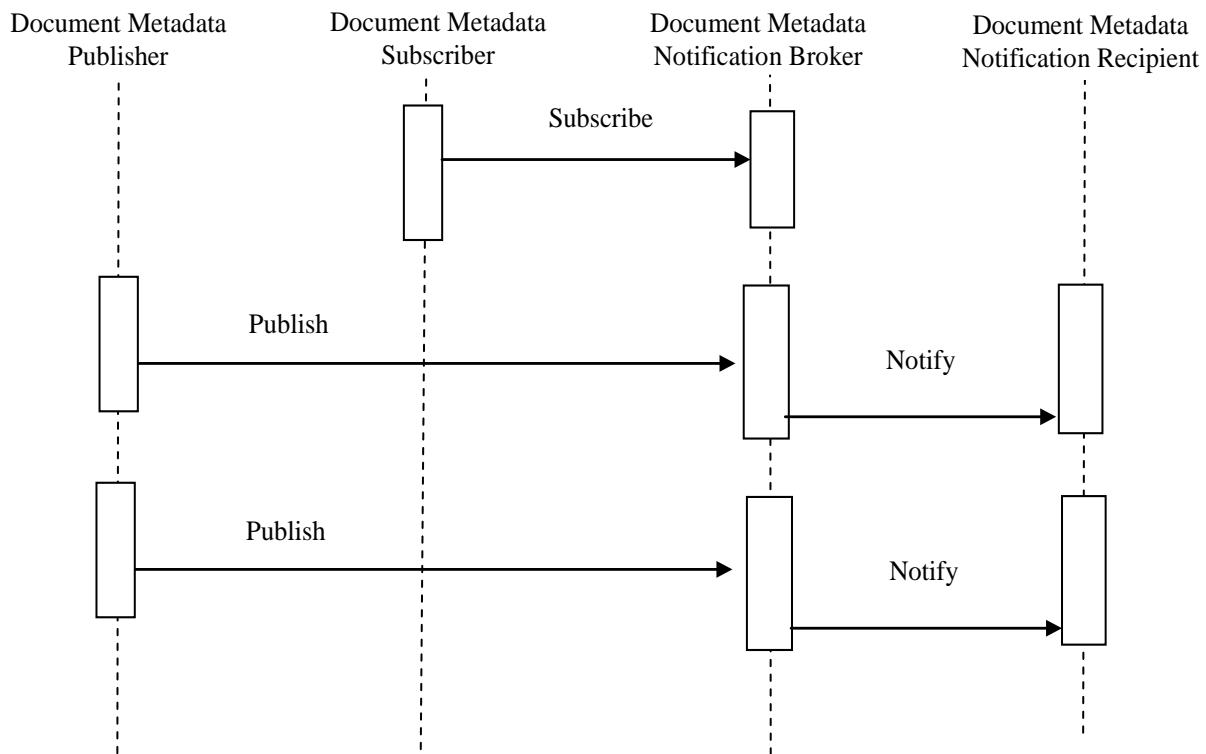
#### 26.4.2.2 Use Case #2: Long-term Subscription

##### 26.4.2.2.1 Long-term Subscription Use Case Description

- 395 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-

400 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 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



405

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

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

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

410 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.

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

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

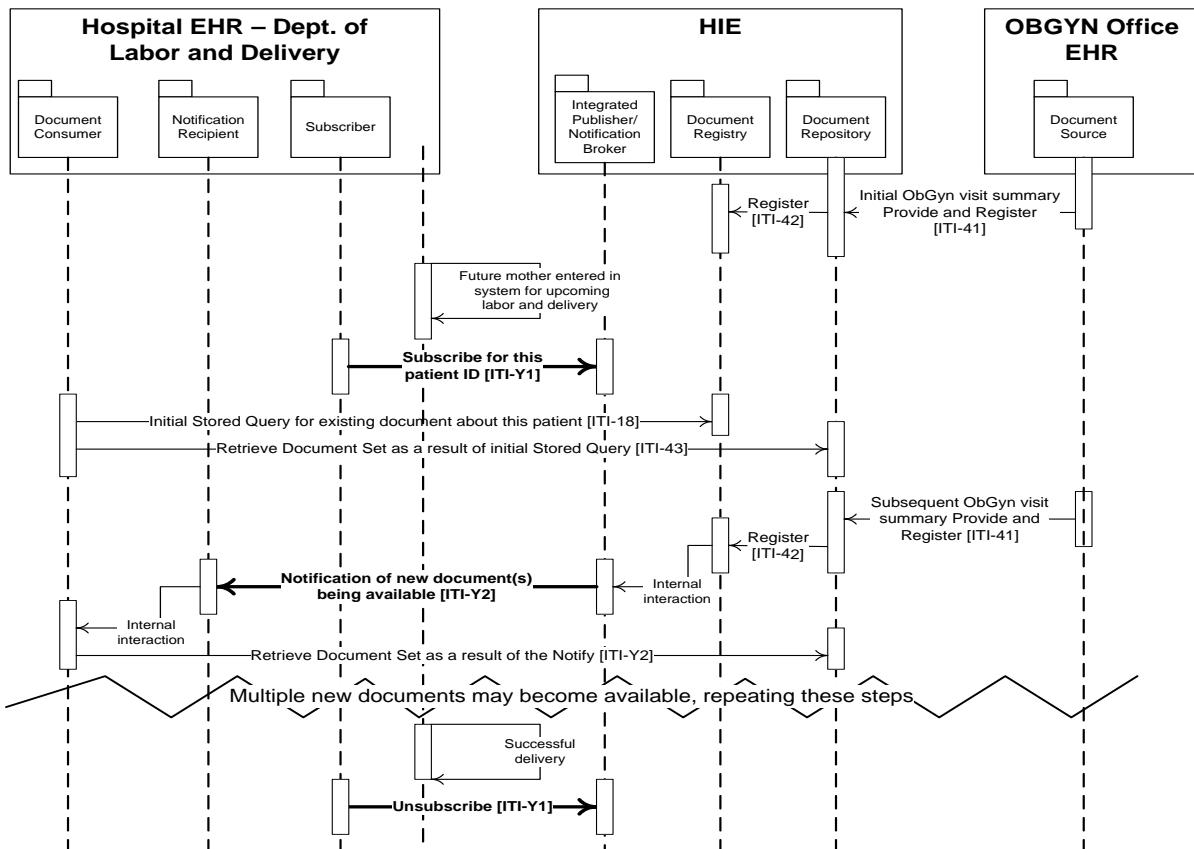


Figure 26.4.2.3.2-1: Interaction diagram for Long-term Subscription Use Case

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

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

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.

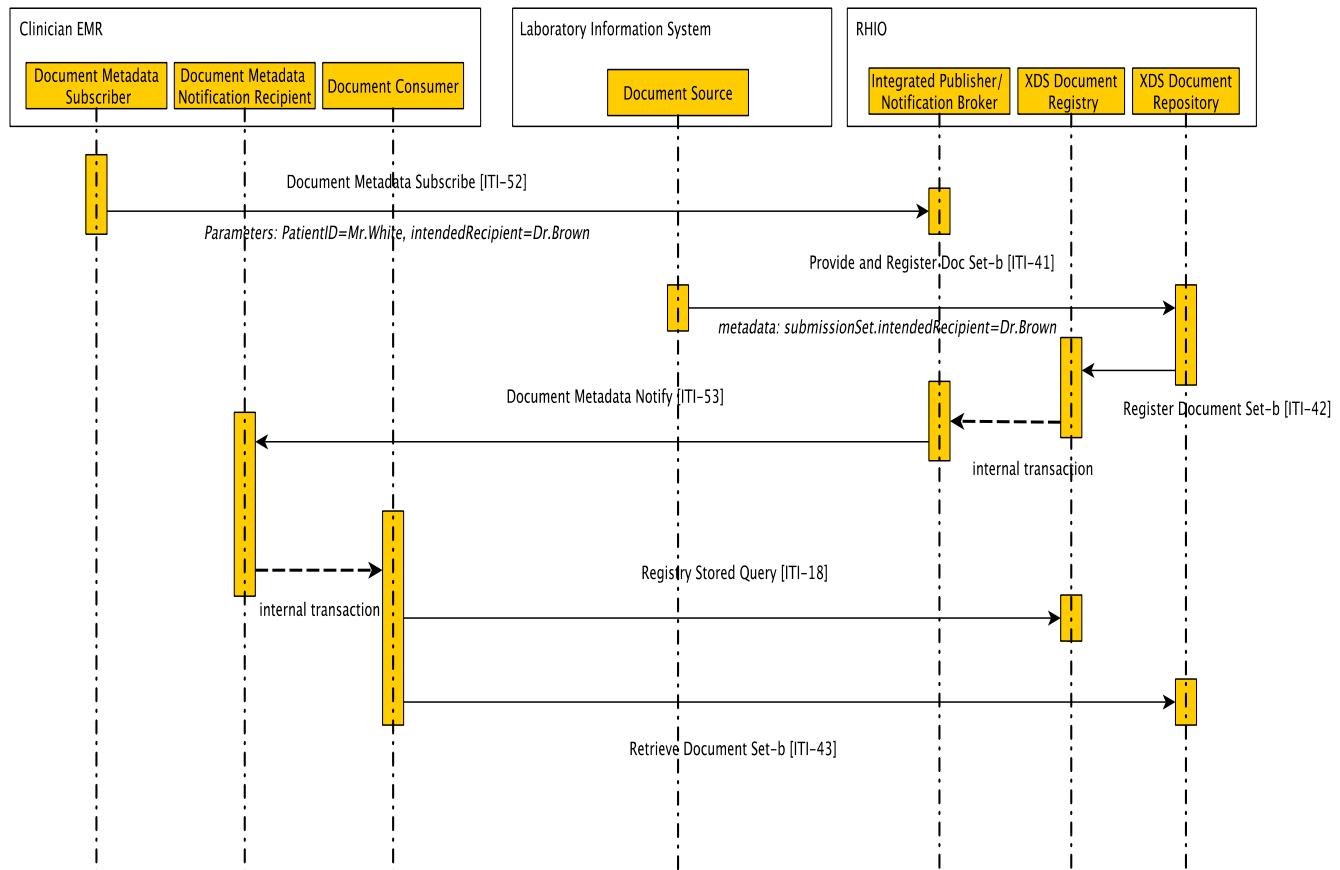
430 **26.4.2.4.1 Targeted Document Publication Use Case Description**

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).

435 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.

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. 440 Brown's system (identified as Document Metadata Notification Recipient actor in the subscription created). 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



445

**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.).

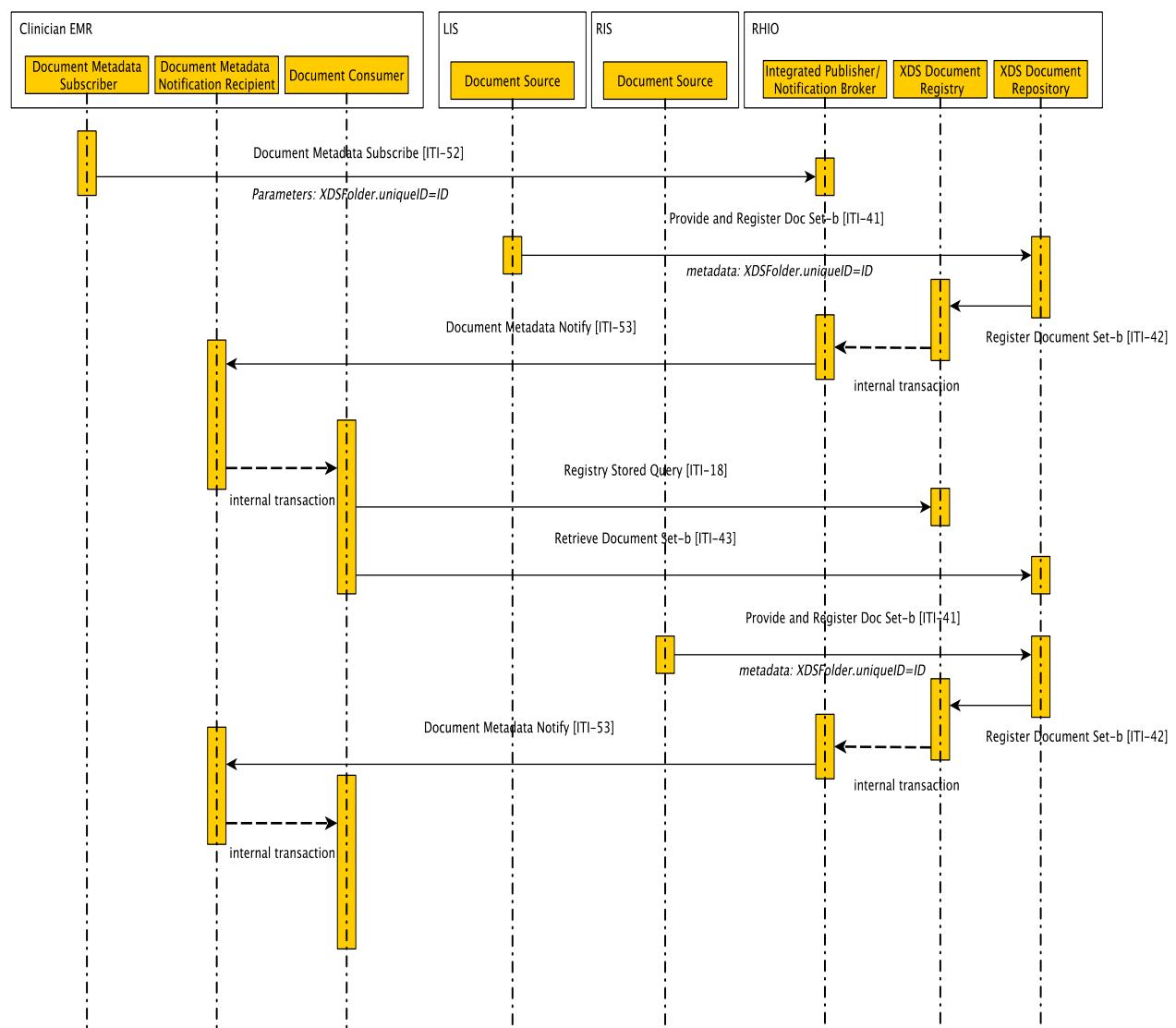
##### 26.4.2.5.1 Folder subscription Use Case Description

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 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.

- 460 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  
465 is kept up to date during the clinical processes.

### 26.4.2.5.2. Folder subscription Process Flow



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

470    **26.4.2.6 Use Case #6: Workflow Id subscription**

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 XDSDocumentEntry.ReferenceIdList.

**26.4.2.6.1 Workflow Id subscription Use Case Description**

- 475    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.
- 480    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.

485    **26.4.2.6.1.1 Technical Aspects (Workflow Id and XDSDocumentEntry ReferenceIdList subscription)**

- 490    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 XDSDocumentEntry.ReferenceIdList metadata.

- 495    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 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.
- 500    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

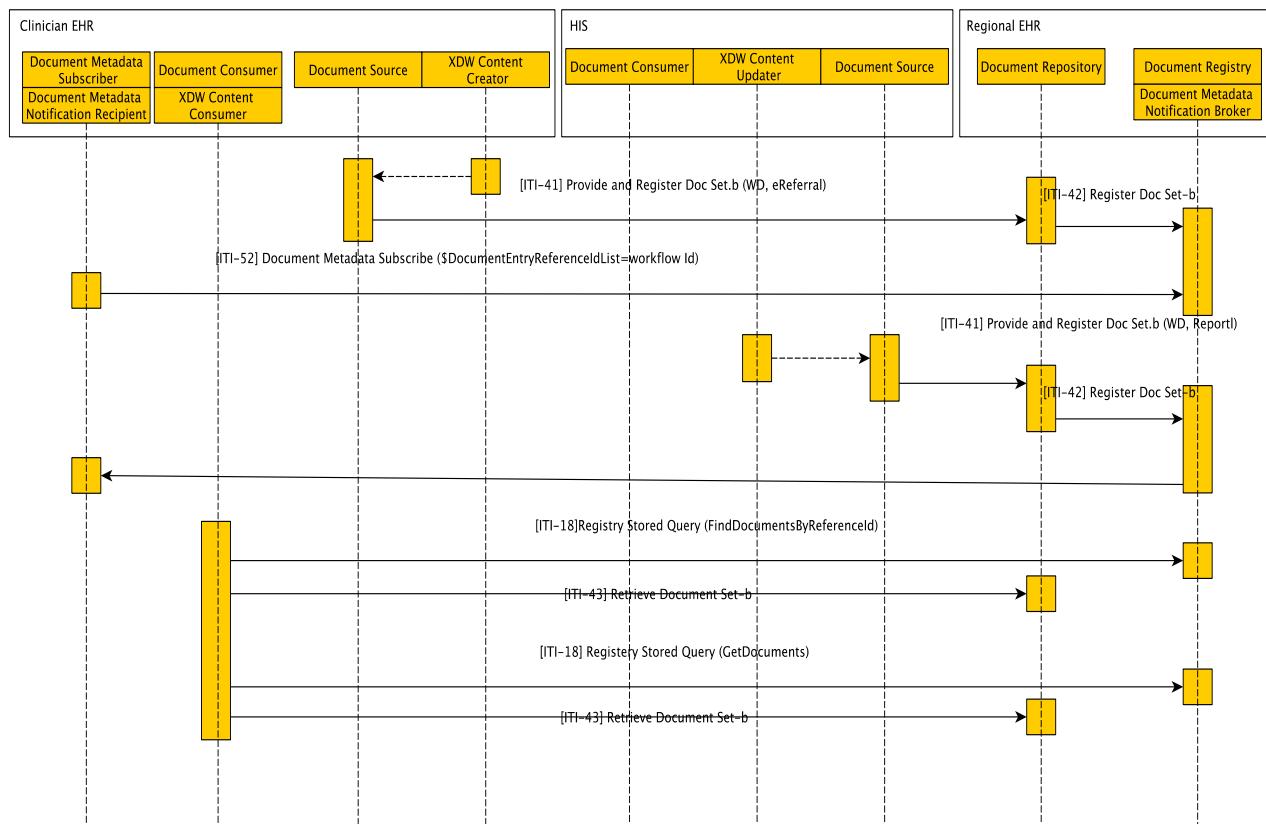


Figure 26.4.2.6.2-1: Interaction Diagram for Workflow Id subscription Use Case

### 505 26.4.2.7 Use Case #7: GP's EHR notification

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

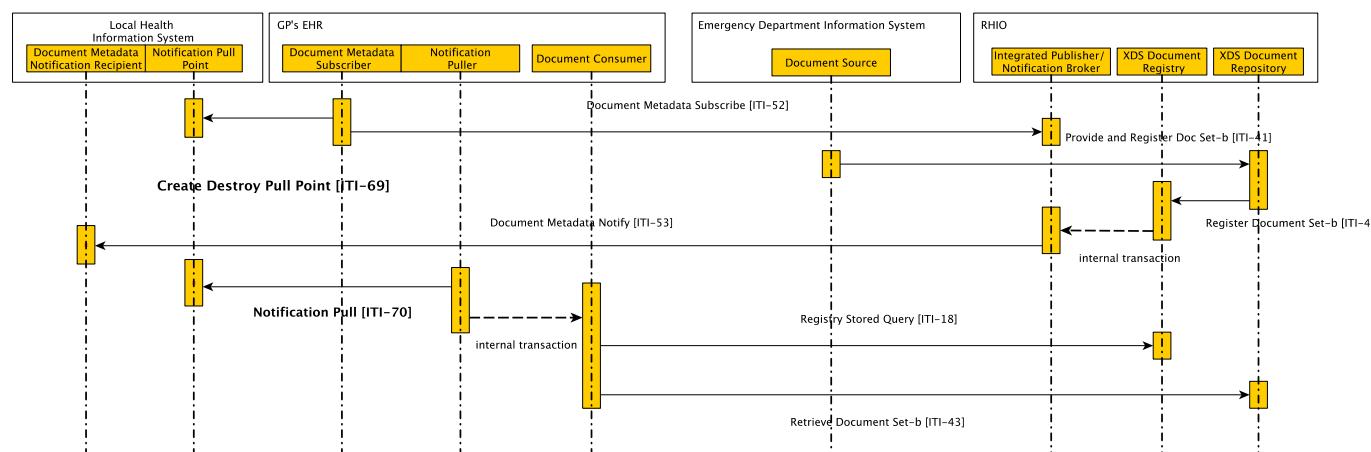
510 Dr. Brown is a GP. He assists many patients and he is very interested in receiving notifications of their eventual hospitalization. This ready acknowledgment and the direct communication between the GP and the hospital can be fundamental for granting a complete and secure clinical approach in solving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

515 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.

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. The Notification Pull Point actor 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.

#### 26.4.2.7.2 GP's EHR notification Process Flow



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

The Document Metadata Subscriber actor that is grouped with the Notification Puller actor 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 actor grouped with the Notification Pull Point actor.

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

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

550 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].

## 26.5 DSUB Security Considerations

555 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).

560 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.

565 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.)

570 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, than the control of access policies is in query/retrieve transactions of the Document Metadata Notification Recipient. It is suggested 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.

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

580    **26.6 DSUB Cross Profile Considerations**

Within an XDS Affinity Domain:

- the Document Metadata Notification Broker will most likely be grouped with a Document Registry actor
- the Document Metadata Subscriber will most likely be grouped with a Document Consumer actor
- the Document Metadata Publisher actor will most likely be grouped with a Document Registry actor.
- the Document Metadata Notification Recipient actor will likely be grouped with a Document Consumer.

585    In an XCA environment:

- the Document Metadata Notification Broker actor will most likely be grouped with Initiating and Responding Gateway actors.
- the Document Metadata Subscriber will most likely be grouped with an Initiating Gateway actor.
- the Document Metadata Notification Recipient will most likely be grouped with a Responding Gateway actor.

## Volume 2 - Transactions

600

*Add Section 3.52*

### 3.52 Document Metadata Subscribe

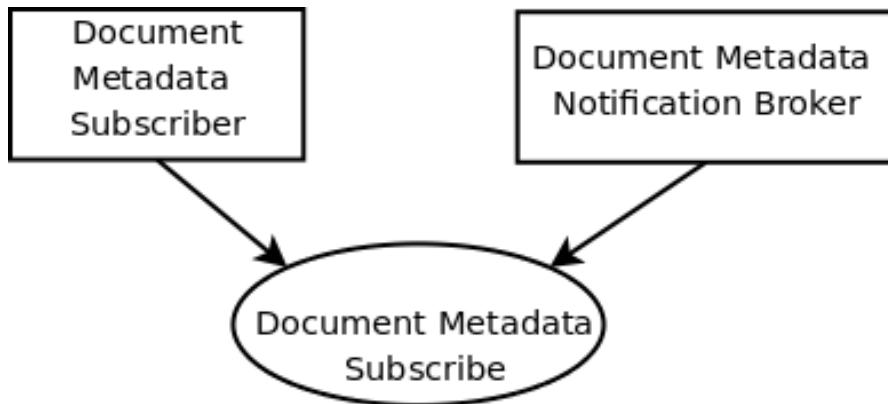
This section corresponds to Transaction ITI-52 of the IHE IT Infrastructure Technical Framework. Transaction ITI-52 is used by the Document Metadata Subscriber and the Document Metadata Notification Broker actors.

605

#### 3.52.1 Scope

This transaction involves a request by the Document Metadata Subscriber actor 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



610

**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

615

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

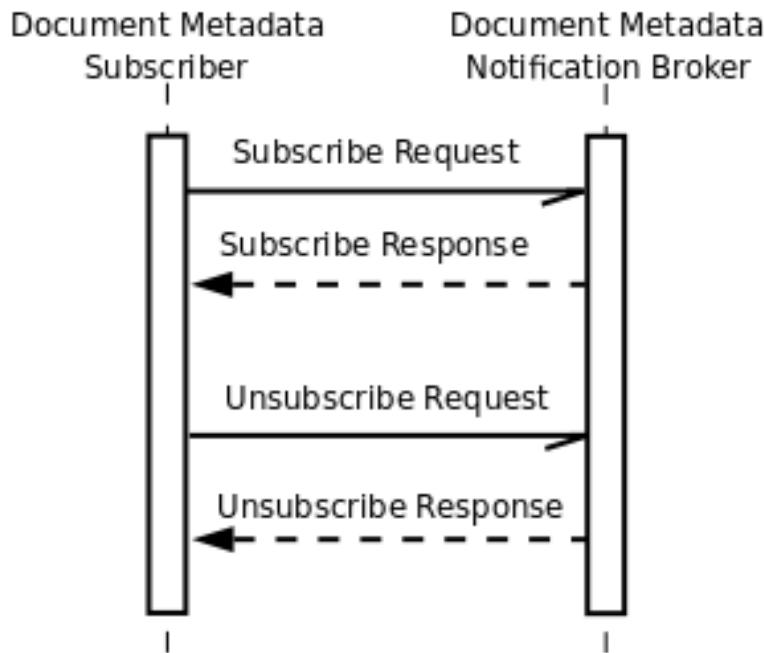
#### 3.52.3 Referenced Standards

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

620

- IHE ITI TF-2a: 3.18 - Registry Stored Query Transaction
- IHE ITI TF-2x: Appendix V

### 3.52.4 Interaction Diagram



625

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

#### 3.52.4.1 Subscribe Request Message

##### 3.52.4.1.1 Trigger

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

630

##### 3.52.4.1.2 Message Semantics

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.

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

640 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.

645 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 *wsnt: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.

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

- 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.
- 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.
- 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 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.

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

```
675 <?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>
  680   <a:MessageID>382dc7c7-8e84-9fdc-8443-48fd83bca938</a:MessageID>
    <a:To s:mustUnderstand="1">http://localhost:8080/services/initiatingGateway/query</a:To>
  </s:Header>
  685   <s:Body>
    <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>
        <wsnt:TopicExpression Dialect="http://docs.oasis-open.org/wsn/t-
1/TopicExpression/Simple">ihe:MinimalDocumentEntry</wsnt:TopicExpression>
          <rim:AdhocQuery id="urn:uuid:aa2332d0-f8fe-11e0-be50-0800200c9a66">
            <rim:Slot name="$XDSDocumentEntryPatientId">
              <rim:ValueList>
  690    <rim:Value>'st3498702^^^&#1.3.6.1.4.1.21367.2005.3.7&ISO'</rim:Value>
              </rim:ValueList>
            </rim:Slot>
            <rim:Slot name="$XDSDocumentEntryHealthcareFacilityTypeCode">
              <rim:ValueList>
                <rim:Value>('Emergency
  695 Department^^healthcareFacilityCodingScheme')</rim:Value>
              </rim:ValueList>
            </rim:Slot>
            </rim:AdhocQuery>
          </wsnt:Filter>
        <wsnt:InitialTerminationTime>2010-05-31T00:00:00.00000Z</wsnt:InitialTerminationTime>
  700      <wsnt:Subscribe>
        </s:Body>
      </s:Envelope>
```

### 3.52.4.2 Subscribe Response Message

#### 3.52.4.2.1 Trigger

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.

#### 725 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

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

730 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:

- an *Address* element, containing a webservices endpoint
- an optional Reference Parameter, containing an *ihe:SubscriptionId* element, which, when present, shall contain a UUID uniquely identifying the subscription. The reference parameter is optional, since the URI in the *Address* element can be constructed to uniquely represent each subscription.

740 In order to unsubscribe, the request shall be sent to the endpoint specified in the Address component of the SubscriptionReference, and, if the *ihe:SubscriptionId* element was sent as a Reference Parameter of the subscription reference, it shall be sent as part of the SOAP header according to the rules described in WS-Addressing.

### 3.52.4.2.3 Expected Actions

745 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.

750 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.

### 755 3.52.4.2.4 Example

```
<?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:ihe="urn:ihe:iti:dsub:2009"
    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">
    <s:Header>
        <a:Action>http://docs.oasis-open.org/wsn/bw-
2/NotificationProducer/SubscribeResponse</a:Action>
    </s:Header>
    <s:Body>
```

```
770      <wsnt:SubscribeResponse>
771          <!-- A WS-Addressing endpoint, where modification and cancelation requests for this
772              subscription must be sent -->
773          <wsnt:SubscriptionReference>
774              <a:Address>https://NotificationBrokerServer/Subscription/</a:Address>
775                  <a:ReferenceParameters>
776                      <ihe:SubscriptionId>382dc7c7-8e84-9fdc-8443-48fd83bca938</ihe:SubscriptionId>
777                          </a:ReferenceParameters>
778                  </wsnt:SubscriptionReference>
779                  <wsnt:TerminationTime>2008-05-31T00:00:00Z</wsnt:TerminationTime>
780          </wsnt:SubscribeResponse>
781      </s:Body>
782  </s:Envelope>
```

### 3.52.4.3 Unsubscribe Request Message

#### 3.52.4.3.1 Trigger

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

#### 3.52.4.3.2 Message Semantics

- 786 The Unsubscribe Request message shall comply with the requirements in the WS-BaseNotification standard. The message conveys the request to cancel an existing subscription.  
790 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

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

- 795 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 a ResourceUnknownFault or an UnableToDestroySubscriptionFault SOAP Fault message as appropriate.

#### 800 3.52.4.3.4 Example

```
<?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
805     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:ihe="urn:ihe:iti:dsb:2009"
            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">
    <s:Header>
        <a:Action>http://docs.oasis-open.org/wsn/bw-
810        /SubscriptionManager/UnsubscribeRequest</a:Action>
        <a:MessageID>382dc7c7-8e84-9fdc-8443-48fd83bca938</a:MessageID>
        <a:To>https://NotificationBrokerServer/Subscription/</a:To>
```

815            <ihe:SubscriptionId a:IsReferenceParameter="true">382dcdc7-8e84-9fdc-8443-  
48fd83bca938</ihe:SubscriptionId>  
820            </s:Header>  
              <s:Body>  
              <wsnt:Unsubscribe/>  
              </s:Body>  
              </s:Envelope>

### 3.52.4.4 Unsubscribe Response Message

#### 3.52.4.4.1 Trigger

825 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.

#### 3.52.4.4.2 Message Semantics

830 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.

#### 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.

835 **3.52.4.4 Example**

840 <%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-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">  
845            <s:Header>  
              <a:Action>http://docs.oasis-open.org/wsn/bw-  
2/SubscriptionManager/UnsubscribeResponse</a:Action>  
              </s:Header>  
              <s:Body>  
              <wsnt:UnsubscribeResponse/>  
              </s:Body>  
              </s:Envelope>

### 3.52.5 Subscription Topics and Filter Expressions

855 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].

### **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 860 subscription Request which specify folder's topic generating a fault (see section 3.52.4.1.3 “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 865 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.

#### **3.52.5.1.2 ihe:MinimalDocumentEntry**

This topic indicates that the events for which the subscription is made shall be Document Entry 870 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.

#### **3.52.5.1.3 ihe:FolderMetadata**

This topic indicates that the events for which the subscription is made shall be creating or 875 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.

#### **3.52.5.1.4 ihe:SubmissionSetMetadata**

This topic indicates that the event for which the subscription is made shall be creating a 880 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.

### **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 885 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 FindDocumentsByReferenceId, GetFolders, FindFolders, FindSubmissionSet queries defined within the Registry Stored Query transaction

890 and use the syntax of the 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.

900 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.

905 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

910

```
<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', ,
        '44970^^codScheme', '44979^^codScheme')</rim:Value>
    </rim:ValueList>
  </rim:Slot>
</rim:AdhocQuery>
```

915

920

925 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:

```
<lcm:SubmitObjectsRequest>
  <rim:RegistryObjectList>
```

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```
935      <rim:ExtrinsicObject id="Document01" mimeType="text/xml" objectType="urn:uuid:7edca82f-  
054d-47f2-a032-9b2a5b5186c1">  
936      ...  
937          <rim:Classification classificationScheme="urn:uuid:2c6b8cb7-8b2a-4051-b291-  
b1ae6a575ef4" classifiedObject="Document01" nodeRepresentation="44950">  
938              <rim:Name>  
939                  <rim:LocalizedString value="Appendectomy" />  
940              </rim:Name>  
941              <rim:Slot name="codingScheme">  
942                  <rim:ValueList>  
943                      <rim:Value>CPT codes</rim:Value>  
944                  </rim:ValueList>  
945              </rim:Slot>  
946          </rim:Classification>  
947          ...  
948          <rim:ExternalIdentifier id="ei01" registryObject="Document01"  
949              identificationScheme="urn:uuid:58a6f841-87b3-4a3e-92fd-a8ffeff98427"  
950              value="'st3498702^^^&#1.3.6.1.4.1.21367.2005.3.7&#ISO'">  
951              <rim:Name>  
952                  <rim:LocalizedString value="XDSDocumentEntry.patientId" />  
953              </rim:Name>  
954          </rim:ExternalIdentifier>  
955          ...  
956          <rim:ExtrinsicObject>  
957      </rim:RegistryObjectList>  
958  </lcm:SubmitObjectsRequest>
```

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

```
965  <?xml version="1.0" encoding="UTF-8"?>  
966  <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"  
967      xmlns:a="http://www.w3.org/2005/08/addressing"  
968      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
969      xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"  
970      xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"  
971      xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-  
972      envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd  
973      http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd  
974      urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0 ../schema/ebRS/rim.xsd">  
975  <s:Header>  
976      <a:Action>http://docs.oasis-open.org/wsn/bw-  
977      2/NotificationProducer/SubscribeRequest</a:Action>  
978      <a:MessageID>382dc7-e84-9fd-8443-48fd83bca938</a:MessageID>  
979  </s:Header>  
980  <s:Body>  
981      <wsnt:Subscribe>  
982          <!-- The Recipient on whose behalf the subscription is requested - the address where<br/>983          the notification is to be sent -->  
984          <wsnt:ConsumerReference>  
985              <a:Address>https://NotificationRecipientServer/xdsBnotification</a:Address>  
986          </wsnt:ConsumerReference>  
987          <wsnt:Filter>  
988              <wsnt:TopicExpression Dialect="http://docs.oasis-open.org/wsn/t-  
989              1/TopicExpression/Simple">ihe:FullDocumentEntry</wsnt:TopicExpression>  
990              <rim:AdhocQuery id="urn:uuid:aa2332d0-f8fe-11e0-be50-0800200c9a66">  
991                  <rim:Slot name="$XDSDocumentEntryPatientId">  
992                      <rim:ValueList>  
993                          <rim:Value>'st3498702^^^&#1.3.6.1.4.1.21367.2005.3.7&#ISO'</rim:Value>  
994                      </rim:ValueList>
```

```
        </rim:Slot>
        <rim:Slot name="$XDSDocumentEntryEventCodeList">
            <rim:ValueList>

<rim:Value>('44950^^codScheme', '44955^^codScheme', '44960^^codScheme', '
44970^^codScheme', '44979^^codScheme')</rim:Value>
            </rim:ValueList>
        </rim:Slot>
        <rim:AdhocQuery>
            </wsnt:Filter>
            <wsnt:InitialTerminationTime>2008-07-31T00:00:00.00000Z</wsnt:InitialTerminationTime>
        </wsnt:Subscribe>
    </s:Body>
</s:Envelope>
```

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.

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**

A Document Metadata Notification Broker that accepts a Subscribe Request containing filter expressions based on FindDocumentsByReferenceID query 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
  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

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

- 1035        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
- 1040        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
- 1045        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.

1050        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:

```
1055 <?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>382dc7c7-8e84-9fdc-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
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-
1/TopicExpression/Simple">ihe:MinimalDocumentEntry</wsnt:TopicExpression>
                <rim:AdhocQuery id="urn:uuid:aa2332d0-f8fe-11e0-be50-0800200c9a66">
                    <rim:Slot name="$XDSDocumentEntryPatientId">
                        <rim:ValueList>
```

```

1085      :Value>                                <rim:Value>'st3498702^^^&#13.6.1.4.1.21367.2005.3.7&#ISO'</rim
1085      :Value>
1085      </rim:ValueList>
1085      </rim:Slot>
1085      <rim:Slot name="$XDSDocumentEntryHealthcareFacilityTypeCode">
1085          <rim:ValueList>
1085              <rim:Value>('Emergency
1090          Department^^healthcareFacilityCodingScheme')</rim:Value>
1090          </rim:ValueList>
1090          </rim:Slot>
1095          </rim:AdhocQuery>
1095          </wsnt:Filter>
1095          <wsnt:InitialTerminationTime>2010-05-31T00:00:00.00000Z</wsnt:InitialTerminationTime>
1095          </wsnt:Subscribe>
1095      </s:Body>
1095  </s:Envelope>

```

### 1100 3.52.5.2.2 Subscriptions for folders metadata

This type of filter shall be accepted by a Document Metadata Notification Broker actor 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 actor MAY be 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;
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 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:

```

1120      <?xml version="1.0" encoding="UTF-8"?>
1120      <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
1120          xmlns:a="http://www.w3.org/2005/08/addressing"
1120          xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
1120          xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
1120          xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
1120          xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
1120          envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
1120          http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd
1120          urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0 ../schema/ebRS/rim.xsd">

```

```

1135 <s:Header>
    <a:Action>http://docs.oasis-open.org/wsn/bw-
2/NotificationProducer/SubscribeRequest</a:Action>
    <a:MessageID>382dc7c7-8e84-9fdc-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
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-
1/TopicExpression/Simple">ihe:FolderMetadata</wsnt:TopicExpression>
            <rim:AdhocQuery id="urn:uuid:9376254e-da05-41f5-9af3-ac56d63d8ebd">
                <rim:Slot name="$XDSFolderPatientId">
                    <rim:ValueList>
                        <rim:Value>'st3498702^&1.3.6.1.4.1.21367.2005.3.7&ISO'</rim:
1140 :Value>
                        </rim:ValueList>
                    </rim:Slot>
                    <rim:Slot name="$XDSFolderCodeList">
                        <rim:ValueList>
                            <rim:Value>('FolderCodeExample^^folderCodeListCodingScheme')</rim:Val
1145 ue>
                            </rim:ValueList>
                        </rim:Slot>
                    </rim:AdhocQuery>
                </wsnt:Filter>
                <wsnt:InitialTerminationTime>2010-05-31T00:00:00.00000Z</wsnt:InitialTerminationTime>
1150 </wsnt:Subscribe>
            </s:Body>
        </s:Envelope>
1155
1160
1165

```

### 3.52.5.2.3 Subscriptions for SubmissionSets metadata

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 actor 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:

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;
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;
- 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.

1185 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.

1190 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:

```

1200 <?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-
1205 /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
1210 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-
1215 1/TopicExpression/Simple">ihe:SubmissionSetMetadata</wsnt:TopicExpression>
                <rim:AdhocQuery id="urn:uuid:fbede94e-dbdc-4f6b-bc1f-d730e677cece">
                    <rim:Slot name="$XDSSubmissionSetPatientId">
                        <rim:ValueList>
                            <rim:Value>'st3498702^^&1.3.6.1.4.1.21367.2005.3.7&ISO'</rim
1220 :Value>
                        </rim:ValueList>
                    </rim:Slot>
                    <rim:Slot name="$XDSSubmissionSetIntendedRecipient">
                        <rim:ValueList>
1225
1230

```

```
1235             <rim:Value>('Some Hospital%')</rim:Value>
1236             <rim:Value>('Welby%')</rim:Value>
1237         </rim:ValueList>
1238     </rim:Slot>
1239 </rim:AdhocQuery>
1240 </wsnt:Filter>
1241 <wsnt:InitialTerminationTime>2010-05-31T00:00:00.00000Z</wsnt:InitialTerminationTime>
1242 </wsnt:Subscribe>
1243 </s:Body>
1244 </s:Envelope>
```

### 1245 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.

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)

1255 Topics, defined in 3.52.5.1 and filter expressions, defined in 3.52.5.3, 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 |

### **3.52.6 Security Considerations**

1260 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:

- 1265

  - Document Metadata Subscriber and Document Metadata Notification Broker shall be grouped with an ATNA Secure Node or Secure Application actor 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)

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.

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

- 1275 • 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
- 1280 • 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

### 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:

1285 **3.52.6.1.1 Document Metadata Subscriber audit message:**

|  | Field Name            | Opt | Value Constraints   |
|--|-----------------------|-----|---|
| <b>Event</b><br><small>AuditMessage/<br/>EventIdentification</small> | EventID               | M   | EV(110112, DCM, "Query")  |
|  | EventActionCode       | M   | "C" (Create) for Subscription message exchange<br>"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>   |                       |     |   |

Where:

|   |                            |   |  |
|---|----------------------------|---|--|
| <b>Source</b><br><small>AuditMessage/<br/>ActiveParticipant</small> | UserID                     | C | When WS-Addressing is used: <ReplyTo>  |
|   | AlternativeUserID          | M | the process ID as used within the local operating system in the local system logs. |
|   | UserName                   | U | <i>not specialized</i>   |
|   | UserIsRequestor            | M | "true"   |
|   | RoleIDCode                 | M | EV(110153, DCM, "Source")  |
|   | NetworkAccessPointTypeCode | M | "1" for machine (DNS) name, "2" for IP address                                     |
|   | NetworkAccessPointID       | M | The machine name or IP address, as specified in RFC 3881.                          |

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

|  |                            |   |   |
|--|----------------------------|---|---|
| <b>Destination</b><br>AuditMessage/<br>ActiveParticipant | UserID                     | M | SOAP endpoint URI.  |
|  | AlternativeUserID          | U | <i>not specialized</i>                                    |
|  | UserName                   | U | <i>not specialized</i>                                    |
|  | UserIsRequestor            | M | “false”   |
|  | RoleIDCode                 | M | EV(110152, DCM, “Destination”)                            |
|  | NetworkAccessPointTypeCode | M | “1” for machine (DNS) name, “2” for IP address            |
|  | NetworkAccessPointID       | M | The machine name or IP address, as specified in RFC 3881. |

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

1290

|  |                                |   |                                   |
|--|--------------------------------|---|-----------------------------------|
| <b>Patient<br/>(if known)</b><br>(AuditMessage/<br>ParticipantObjectIdentifi-<br>cation) | ParticipantObjectTypeCode      | M | “1” (Person)                      |
|  | ParticipantObjectTypeCodeRole  | M | “1” (Patient)                     |
|  | ParticipantObjectDataLifeCycle | U | <i>not specialized</i>            |
|  | ParticipantObjectIDTypeCode    | M | EV(2, RFC-3881, “Patient Number”) |
|  | ParticipantObjectSensitivity   | U | <i>not specialized</i>            |
|  | ParticipantObjectID            | M | The patient ID in HL7 CX format.  |
|  | ParticipantObjectName          | U | <i>not specialized</i>            |
|  | ParticipantObjectQuery         | U | <i>not specialized</i>            |
|  | ParticipantObjectDetail        | U | <i>not specialized</i>            |

|  |                                |   |   |
|--|--------------------------------|---|---|
| <b>Query Parameters</b><br>(AuditMessage/<br>ParticipantObjectIdentifi-<br>cation) | ParticipantObjectTypeCode      | M | “2” (system object)   |
|  | ParticipantObjectTypeCodeRole  | M | “24” (query)  |
|  | ParticipantObjectDataLifeCycle | U | <i>not specialized</i>  |
|  | ParticipantObjectIDTypeCode    | M | EV(“ITI-52”, “IHE Transactions”, “Document Metadata Subscribe”) |
|  | ParticipantObjectSensitivity   | U | <i>not specialized</i>  |
|  | ParticipantObjectID            | U | <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:

|   | <b>Field Name</b>            | <b>Opt</b> | <b>Value Constraints</b>  |
|---|------------------------------|------------|---|
| <b>Event</b><br><i>AuditMessage/EventIdentification</i>         | EventID                      | M          | EV(110112, DCM, “Query”)  |
|   | EventActionCode              | M          | “C” (Create) for Subscription message exchange<br>“D” (Delete) for Unsubscribe message exchange |
|   | <i>EventDateTime</i>         | M          | <i>not specialized</i>  |
|   | <i>EventOutcomeIndicator</i> | M          | <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>                                      |                              |            |   |

Where:

|  |                            |   |   |
|--|----------------------------|---|---|
| <b>Source</b><br><i>AuditMessage/ActiveParticipant</i> | UserID                     | C | When WS-Addressing is used: <ReplyTo/>                    |
|  | AlternativeUserID          | U | <i>not specialized</i>                                    |
|  | <i>UserName</i>            | U | <i>not specialized</i>                                    |
|  | UserIsRequestor            | M | “true”  |
|  | RoleIDCode                 | M | EV(110153, DCM, “Source”)                                 |
|  | NetworkAccessPointTypeCode | M | “1” for machine (DNS) name, “2” for IP address            |
|  | NetworkAccessPointID       | M | The machine name or IP address, as specified in RFC 3881. |

|   |                            |   |  |
|---|----------------------------|---|--|
| <b>Destination</b><br><i>AuditMessage/ActiveParticipant</i> | UserID                     | M | SOAP endpoint URL  |
|   | AlternativeUserID          | M | the process ID as used within the local operating system in the local system logs. |
|   | <i>UserName</i>            | U | <i>not specialized</i>   |
|   | UserIsRequestor            | M | “false”  |
|   | RoleIDCode                 | M | EV(110152, DCM, “Destination”)   |
|   | NetworkAccessPointTypeCode | M | “1” for machine (DNS) name, “2” for IP address                                     |
|   | NetworkAccessPointID       | M | The machine name or IP address, as specified in RFC 3881.                          |

1295

|  |                              |          |                         |
|--|------------------------------|----------|-------------------------|
| <b>Audit Source</b><br><i>AuditMessage/AuditSourceIdentification</i> | <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</b> | <i>ParticipantObjectTypeCode</i> | <i>M</i> | “1” (Person) |
|----------------|----------------------------------|----------|--------------|

|  |                                       |   |                                   |
|--|---------------------------------------|---|-----------------------------------|
|  | ParticipantObjectTypeCodeRole         | M | “1” (Patient)                     |
|  | <i>ParticipantObjectDataLifeCycle</i> | U | <i>not specialized</i>            |
|  | ParticipantObjectIDTypeCode           | M | EV(2, RFC-3881, “Patient Number”) |
|  | <i>ParticipantObjectSensitivity</i>   | U | <i>not specialized</i>            |
|  | ParticipantObjectID                   | M | The patient ID in HL7 CX format.  |
|  | <i>ParticipantObjectName</i>          | U | <i>not specialized</i>            |
|  | <i>ParticipantObjectQuery</i>         | U | <i>not specialized</i>            |
|  | <i>ParticipantObjectDetail</i>        | U | <i>not specialized</i>            |

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

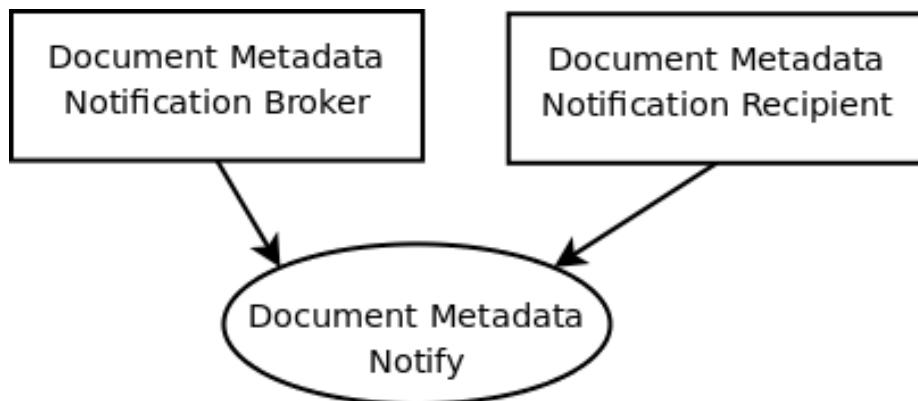
### 3.53 Document Metadata Notify

1300 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

1305 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

- 1310    **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

- 1315
- [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

### 3.53.4 Interaction Diagram

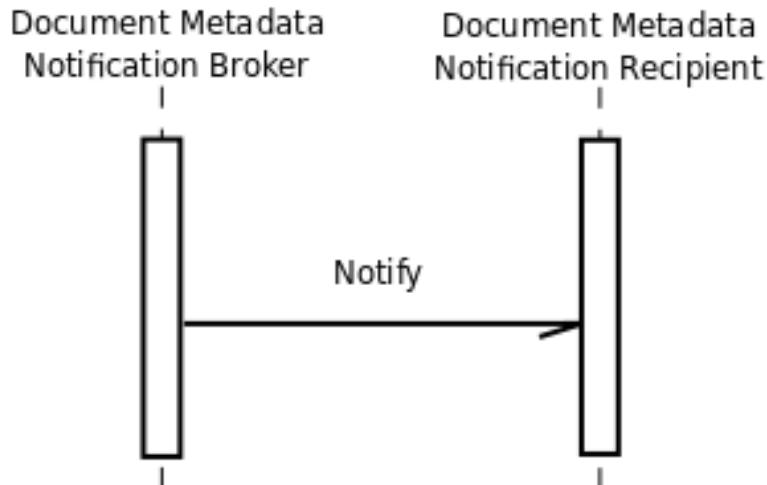


Figure 3.53.4-1: Document Metadata Notify Sequence

#### 3.53.4.1 Notify Message

- 1325    **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.

- 1330    **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.
- 1335    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:
- 1340    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.
- 1345    A Minimal Notification, which shall be sent if the subscription request included the topic *ihe:MinimalDocumentEntry*. In this case the response consists of the *<ihe:RetrieveDocumentSetRequest>* element, as defined in the XDS Retrieve Document Set transaction (ITI TF-2b: 3.43.4.1). The element is sent as the only child of the *wsnt:Notify/wsnt:NotificationMessage/wsnt:Message* element.
- 1350    A Folder Notification, which shall be sent if the subscription request included the topic *ihe:FolderMetadata*. A Document Metadata Notification Broker actor 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 *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-ea235fbc94c2"* (that represents an object of Folder type).
- 1360    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

1370 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).

1375  
1380 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

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.

1385 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.

1390 If the Document Metadata Notification Recipient actor is grouped with a Notification Pull Point  
actor, 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)

```
<?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"
    xmlns:ihe="urn:ihe:iti:dsub:2009"
    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>382dcda-8e87-9fdf-8446-48fd83bca93b</a:MessageID>
        <a:To>https://NotificationRecipientServer/xdsBnotification</a:To>
    </s:Header>
    <s:Body>
        <wsnt:Notify>
            <wsnt:NotificationMessage>
                <wsnt:SubscriptionReference>
```

```

1415          <a:Address>https://NotificationBrokerServer/Subscription/</a:Address>
1416          <a:ReferenceParameters>
1417              <ihe:SubscriptionId>382dcdc7-8e84-9fdc-8443-
1418                  48fd83bca938</ihe:SubscriptionId>
1419          </a:ReferenceParameters>
1420          </wsnt:SubscriptionReference>
1421          <wsnt:Topic Dialect="http://docs.oasis-open.org/wsn/t-
1422              1/TopicExpression/Simple">ihe:FullDocumentEntry</wsnt:Topic>
1423          <wsnt:ProducerReference>
1424              <a:Address>https://ProducerReference</a:Address>
1425          </wsnt:ProducerReference>
1426          <wsnt:Message>
1427              <lcm:SubmitObjectsRequest>
1428                  <rim:RegistryObjectList>
1429                      <rim:ExtrinsicObject id="Document01" mimeType="text/xml"
1430                          objectType="urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1">
1431                          ...
1432                          <rim:Classification classificationScheme="urn:uuid:2c6b8cb7-8b2a-
1433                              4051-b291-b1ae6a575ef4" classifiedObject="Document01" nodeRepresentation="44950">
1434                              <rim:Name>
1435                                  <rim:LocalizedString value="Appendectomy"/>
1436                              </rim:Name>
1437                              <rim:Slot name="codingScheme">
1438                                  <rim:ValueList>
1439                                      <rim:Value>CPT codes</rim:Value>
1440                                  </rim:ValueList>
1441                              </rim:Slot>
1442                          </rim:Classification>
1443                          ...
1444                          <rim:ExternalIdentifier id="ei01" registryObject="Document01"
1445                              identificationScheme="urn:uuid:58a6f841-87b3-4a3e-92fd-a8ffeff98427"
1446                              value="" st3498702^^^&#13.6.1.4.1.21367.2005.3.7&#ISO'>
1447                              <rim:Name>
1448                                  <rim:LocalizedString value="XDSDocumentEntry.patientId"/>
1449                              </rim:Name>
1450                          </rim:ExternalIdentifier>
1451                          ...
1452                          <rim:ExtrinsicObject>
1453                              </rim:RegistryObjectList>
1454                          <lcm:SubmitObjectsRequest>
1455                              </wsnt:Message>
1456                              </wsnt:NotificationMessage>
1457                          </wsnt:Notify>
1458                      </s:Body>
1459                  </s:Envelope>

```

#### 1460      3.53.4.1.4.2 Minimal Notification Example (ihe:MinimalDocumentEntry)

```

1460      <?xml version="1.0" encoding="UTF-8"?>
1461      <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
1462          xmlns:a="http://www.w3.org/2005/08/addressing"
1463          xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
1464          xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
1465          xmlns:xds="urn:ihe:iti:xds-b:2007"
1466          xmlns:ihe="urn:ihe:iti:dsub:2009"
1467          xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
1468          xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
1469          envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
1470          http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd urn:ihe:iti:xds-b:2007
1471          ../../schema/IHE/XDS.b_DocumentRepository.xsd urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0
1472          ../../schema/ebRS/rim.xsd">
1473          <s:Header>
1474              <a:Action>http://docs.oasis-open.org/wsn/bw-2/NotificationConsumer/Notify</a:Action>
1475              <a:MessageID>382dcda-8e87-9fdf-8446-48fd83bca93b</a:MessageID>

```

```

1480           <a:To>https://NotificationRecipientServer/xdsBnotification</a:To>
</s:Header>
<s:Body>
    <wsnt:Notify>
        <wsnt:NotificationMessage>
            <wsnt:SubscriptionReference>
                <a:Address>https://NotificationBrokerServer/Subscription/</a:Address>
                <ihe:SubscriptionId>382dc7-8e84-9fdc-8443-48fd83bca938</ihe:SubscriptionId>
            </wsnt:SubscriptionReference>
            <wsnt:Topic Dialect="http://docs.oasis-open.org/wsn/t-1/TopicExpression/Simple">ihe:MinimalDocumentEntry</wsnt:Topic>
            <wsnt:ProducerReference>
                <a:Address>https://ProducerReference</a:Address>
            </wsnt:ProducerReference>
            <wsnt:Message>
                <xds:RetrieveDocumentSetRequest>
                    <xds:DocumentRequest>
                        <xds:HomeCommunityId>urn:oid:1.3.2458.2423.458.3.2</xds:HomeCommunityId>
                        <xds:RepositoryUniqueId>1.3.6.4...1000</xds:RepositoryUniqueId>
                        <xds:DocumentUniqueId>1.3.2458.2423.456.5.3.5</xds:DocumentUniqueId>
                    </xds:DocumentRequest>
                </xds:RetrieveDocumentSetRequest>
            </wsnt:Message>
        </wsnt:NotificationMessage>
    </wsnt:Notify>
</s:Body>
</s:Envelope>
```

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

```

1505 <?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
1510   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" xmlns:ihe="urn:ihe:iti:dsub:2009"
      xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
1515 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>382dc7-8e84-9fdc-8443-48fd83bca938</a:MessageID>
        <a:To>https://NotificationRecipientServer/xdsBnotification</a:To>
    </s:Header>
    <s:Body>
        <wsnt:Notify>
            <wsnt:NotificationMessage>
                <wsnt:SubscriptionReference>
                    <a:Address>https://NotificationBrokerServer/Subscription/</a:Address>
                    <a:ReferenceParameters>
                        <ihe:SubscriptionId>382dc7-8e84-9fdc-8443-
1530 48fd83bca938</ihe:SubscriptionId>
                        </a:ReferenceParameters>
                    </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>
```

```

1540           <wsnt:Message>
1541             <lcm:SubmitObjectsRequest
1542               xsi:schemaLocation="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0
1543               ../../schema/ebRS/lcm.xsd"
1544               xmlns:lcm="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0"
1545               xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
1546               xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
1547               xmlns:rs="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0">
1548               <rim:RegistryObjectList>
1549                 <rim:RegistryPackage id="SubmissionSet01">
1550                   <!-- here all the SubmissionSet metadata -->
1551                   </rim:RegistryPackage>
1552                   <rim:Classification id="cl10" classifiedObject="SubmissionSet01"
1553                     classificationNode="urn:uuid:a54d6aa5-d40d-43f9-88c5-
1554                     b4633d873bdd"/>
1555                 </rim:RegistryObjectList>
1556               </lcm:SubmitObjectsRequest>
1557             </wsnt:Message>
1558             </wsnt:NotificationMessage>
1559           </wsnt:Notify>
1560         </s:Body>
1561       </s:Envelope>

```

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

```

1565   <?xml version="1.0" encoding="UTF-8"?>
1566   <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
1567     xmlns:a="http://www.w3.org/2005/08/addressing"
1568     xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
1569     xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
1570     xmlns:lcm="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0"
1571     xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0" xmlns:ihe="urn:ihe:iti:dsub:2009"
1572     xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
1573     envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
1574     http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd
1575     urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0 ../schema/ebRS/rim.xsd" urn:oasis:names:tc:ebxml-
1576     regrep:xsd:lcm:3.0 ../schema/ebRS/lcm.xsd">
1577     <s:Header>
1578       <a:Action>http://docs.oasis-open.org/wsn/bw-2/NotificationConsumer/Notify</a:Action>
1579       <a:MessageID>382dcda-8e87-9fdf-8446-48fd83bca93b</a:MessageID>
1580       <a:To>https://NotificationRecipientServer/xdsBnotification</a:To>
1581     </s:Header>
1582     <s:Body>
1583       <wsnt:Notify>
1584         <wsnt:NotificationMessage>
1585           <wsnt:SubscriptionReference>
1586             <a:Address>https://NotificationBrokerServer/Subscription</a:Address>
1587             <a:ReferenceParameters>
1588               <ihe:SubscriptionId>382dcda-8e84-9fdc-8443-
1589               48fd83bca938</ihe:SubscriptionId>
1590             </a:ReferenceParameters>
1591           </wsnt:SubscriptionReference>
1592           <wsnt:Topic Dialect="http://docs.oasis-open.org/wsn/t-1/TopicExpression/Simple">
1593             <ihe:FolderMetadata></wsnt:Topic>
1594           <wsnt:ProducerReference>
1595             <a:Address>https://ProducerReference</a:Address>

```

```
1600    xsi:schemaLocation="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0
.../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>
        <rim:RegistryPackage id="Folder01">
          <!-- here all the Folder metadata -->
        </rim:RegistryPackage>
        <rim:Classification id="Fol" classifiedObject="Folder01"
          classificationNode="urn:uuid:d9d542f3-6cc4-48b6-8870-
ea235fbc94c2"/>
      </rim:RegistryObjectList>
      </lcm:SubmitObjectsRequest>
      </wsnt:Message>
      </wsnt:NotificationMessage>
      </wsnt:Notify>
    </s:Body>
  </s:Envelope>
```

### 3.53.5 Security Considerations

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:

- 1625      Document Metadata Notification Broker and Document Metadata Notification Recipient actors shall be grouped with an ATNA Secure Node or Secure Application for Node Authentication and Audit Trails
- 1630      The use of encrypted TLS is recommended when the transmission is not otherwise secured (e.g., transmission over a secure network)
- 1635      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 or a cross-community environment managing roles for its users correctly as most of the authorizations will be based on roles.

#### 3.53.5.1 Audit Record Considerations

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.

### 3.53.5.1.1 Document Metadata Notification Recipient audit message:

|  | <b>Field Name</b>            | <b>Opt</b> | <b>Value Constraints</b>                                     |
|--|------------------------------|------------|--|
| <b>Event</b><br><i>AuditMessage/<br/>EventIdentification</i>       | EventID                      | M          | EV(110107, DCM, “Import”)                                    |
|  | EventActionCode              | M          | “C” (Create)   |
|  | <i>EventDateTime</i>         | M          | <i>not specialized</i>                                       |
|  | <i>EventOutcomeIndicator</i> | M          | <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>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><br><i>AuditMessage/<br/>ActiveParticipant</i> | UserID                     | M | When WS-Addressing is used: <From/>                       |
|   | <i>AlternativeUserID</i>   | U | <i>not specialized</i>                                    |
|   | <i>UserName</i>            | U | <i>not specialized</i>                                    |
|   | UserIsRequestor            | M | “false”   |
|   | RoleIDCode                 | M | EV(110153, DCM, “Source”)                                 |
|   | NetworkAccessPointTypeCode | M | “1” for machine (DNS) name, “2” for IP address            |
|   | NetworkAccessPointID       | M | The machine name or IP address, as specified in RFC 3881. |

|  |                            |   |  |
|--|----------------------------|---|--|
| <b>Destination</b><br><i>AuditMessage/<br/>ActiveParticipant</i> | UserID                     | C | When WS-Addressing is used: <ReplyTo/>   |
|  | <i>AlternativeUserID</i>   | M | the process ID as used within the local operating system in the local system logs. |
|  | <i>UserName</i>            | U | <i>not specialized</i>   |
|  | UserIsRequestor            | M | “true”   |
|  | RoleIDCode                 | M | EV(110152, DCM, “Destination”)   |
|  | NetworkAccessPointTypeCode | M | “1” for machine (DNS) name, “2” for IP address                                     |
|  | NetworkAccessPointID       | M | The machine name or IP address, as specified in RFC 3881.                          |

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

|   |                              |   |                         |
|---|------------------------------|---|-------------------------|
| <b>Audit Source</b><br><i>AuditMessage/</i> | <i>AuditSourceID</i>         | U | <i>Not specialized.</i> |
|   | <i>AuditEnterpriseSiteID</i> | U | <i>not specialized</i>  |

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|                           |                            |   |                        |
|---------------------------|----------------------------|---|------------------------|
| AuditSourceIdentification | <i>AuditSourceTypeCode</i> | U | <i>not specialized</i> |
|---------------------------|----------------------------|---|------------------------|

|   |                                       |   |                                   |
|---|---------------------------------------|---|-----------------------------------|
| <b>Patient<br/>(if-known)<br/>(AuditMessage/<br/>ParticipantObjectIdentifi-<br/>cation)</b> | ParticipantObjectTypeCode             | M | “1” (Person)                      |
|   | ParticipantObjectTypeCodeRole         | M | “1” (Patient)                     |
|   | <i>ParticipantObjectDataLifeCycle</i> | U | <i>not specialized</i>            |
|   | ParticipantObjectIDTypeCode           | M | EV(2, RFC-3881, “Patient Number”) |
|   | <i>ParticipantObjectSensitivity</i>   | U | <i>not specialized</i>            |
|   | ParticipantObjectID                   | M | The patient ID in HL7 CX format.  |
|   | <i>ParticipantObjectName</i>          | U | <i>not specialized</i>            |
|   | <i>ParticipantObjectQuery</i>         | U | <i>not specialized</i>            |
|   | <i>ParticipantObjectDetail</i>        | U | <i>not specialized</i>            |

|   |                                       |   |   |
|---|---------------------------------------|---|---|
| <b>Document<br/>Folder<br/>Submission<br/>Set<br/>(AuditMessage/<br/>ParticipantObjectIdentifi-<br/>cation)</b> | ParticipantObjectTypeCode             | M | “2” (System)  |
|   | ParticipantObjectTypeCodeRole         | M | “3” (report)  |
|   | <i>ParticipantObjectDataLifeCycle</i> | U | <i>not specialized</i>  |
|   | ParticipantObjectIDTypeCode           | M | EV("urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1", IHE, "DocumentEntry")<br>EV("urn:uuid:d9d542f3-6cc4-48b6-8870-ea235fb94c2", IHE, "Folder")<br>EV(urn:uuid:a54d6aa5-d40d-43f9-88c5-b4633d873bdd, IHE, "SubmissionSet")   |
|   |                                       |   | The Document Metadata Notification Recipient actor 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>   | U | <i>not specialized</i>  |
|   | ParticipantObjectID                   | M | One of <ihe:DocumentUniqueId/>, XDSFolder.uniqueId, or XDSSubmissionSet.uniqueId<br>The Document Metadata Notification Recipient actor shall include one of these values in accordance with the specific topic used for the creation of the notification  |
|   | <i>ParticipantObjectName</i>          |   | If known the value of <ihe:HomeCommunityId/>  |
|   | <i>ParticipantObjectQuery</i>         | U | <i>not specialized</i>  |
|   | <i>ParticipantObjectDetail</i>        | U | <i>not specialized</i>  |

### 3.53.5.1.2 Document Metadata Notification Broker audit message:

|              | Field Name | Opt | Value Constraints         |
|--------------|------------|-----|---------------------------|
| <b>Event</b> | EventID    | M   | EV(110106, DCM, “Export”) |

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|   |                              |   |  |
|---|------------------------------|---|--|
|   | EventActionCode              | M | “R” (Read)   |
|   | <i>EventDateTime</i>         | M | <i>not specialized</i>                                       |
|   | <i>EventOutcomeIndicator</i> | M | <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><br><i>AuditMessage/ ActiveParticipant</i> | 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>            | U | <i>not specialized</i>   |
|   | UserIsRequestor            | M | “false”  |
|   | RoleIDCode                 | M | EV(110153, DCM, “Source”)  |
|   | NetworkAccessPointTypeCode | M | “1” for machine (DNS) name, “2” for IP address                                     |
|   | NetworkAccessPointID       | M | The machine name or IP address, as specified in RFC 3881.                          |

|  |                            |   |   |
|--|----------------------------|---|---|
| <b>Destination</b><br><i>AuditMessage/ ActiveParticipant</i> | UserID                     | C | When WS-Addressing is used: <ReplyTo/>                    |
|  | <i>AlternativeUserID</i>   | U | <i>not specialized</i>                                    |
|  | <i>UserName</i>            | U | <i>not specialized</i>                                    |
|  | UserIsRequestor            | M | “true”  |
|  | RoleIDCode                 | M | EV(110152, DCM, “Destination”)                            |
|  | NetworkAccessPointTypeCode | M | “1” for machine (DNS) name, “2” for IP address            |
|  | NetworkAccessPointID       | M | The machine name or IP address, as specified in RFC 3881. |

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

|                 |                           |   |              |
|-----------------|---------------------------|---|--------------|
| <b>Document</b> | ParticipantObjectTypeCode | M | “2” (System) |
|-----------------|---------------------------|---|--------------|

|  |                                       |   |   |
|--|---------------------------------------|---|---|
|  | <i>ParticipantObjectTypeCodeRole</i>  | M | “3” (report)  |
|  | <i>ParticipantObjectDataLifeCycle</i> | U | <i>not specialized</i>  |
|  | <i>ParticipantObjectIDTypeCode</i>    | M | <p>EV("urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1", IHE, "DocumentEntry")</p> <p>EV("urn:uuid:d9d542f3-6cc4-48b6-8870-ea235fbc94c2", IHE, "Folder")</p> <p>EV(urn:uuid:a54d6aa5-d40d-43f9-88c5-b4633d873bdd, IHE, "SubmissionSet")</p> <p>The Document Metadata Notification Broker actor 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.</p> |
|  | <i>ParticipantObjectSensitivity</i>   | U | <i>not specialized</i>  |
|  | <i>ParticipantObjectID</i>            | M | <p>The value of &lt;ihe:DocumentUniqueId/&gt;, _XDSFolder.uniqueId, XDSSubmissionSet.uniqueId</p> <p>The Document Metadata Notification Broker actor shall include values in accordance with the specific topic used for the creation of the notification</p>   |
|  | <i>ParticipantObjectName</i>          | C | If known the value of <ihe:HomeCommunityId/>  |
|  | <i>ParticipantObjectQuery</i>         | U | <i>not specialized</i>  |
|  | <i>ParticipantObjectDetail</i>        | U | <i>not specialized</i>  |

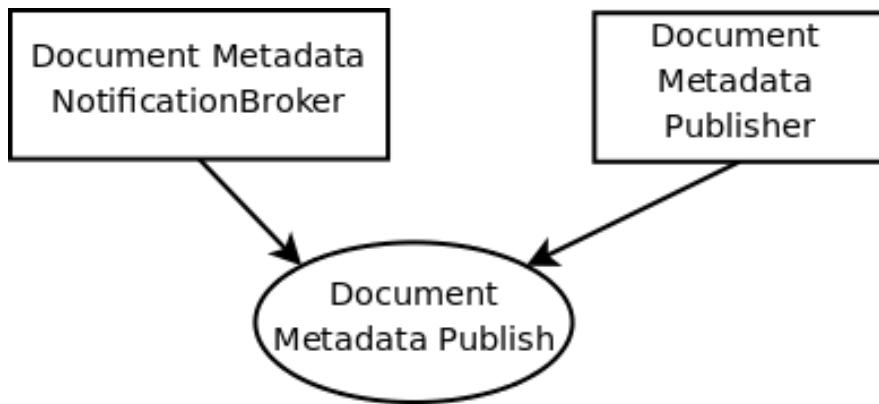
## 1655 3.54 Document Metadata Publish

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.

### 3.54.1 Scope

- 1660 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



1665   **Actor:** Document Metadata Notification Broker

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

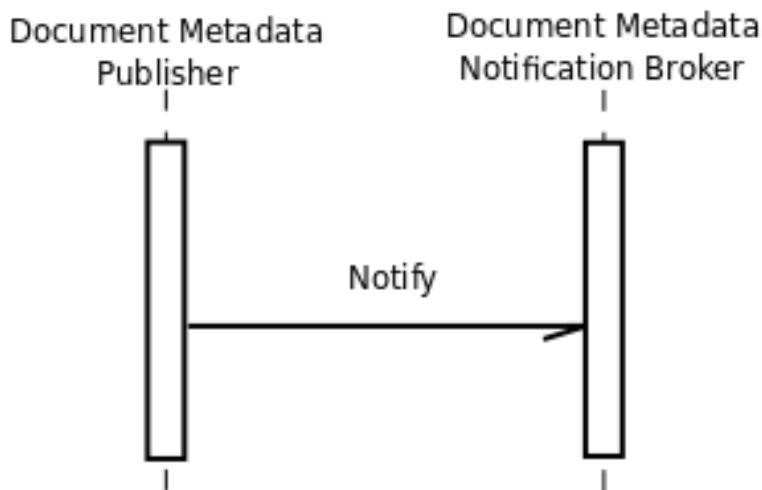
**Actor:** Document Metadata Publisher

**Role:** Publishes information to the Document Metadata Notification Broker when new applicable events occur.

1670   **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](#)
- 1675
  - IHE ITI TF-2b: 3.43.4.2.2
  - IHE ITI TF-2x: Appendix V

### 3.54.4 Interaction Diagram



**Figure 3.54.4-1: Document Metadata Publish Sequence**

1680    **3.54.4.1 Notify Message**

#### 3.54.4.1.1 Trigger

When an event occurs of interest to the Document Metadata Notification Broker, the Document Metadata Publisher will trigger a Notification message to the configured Document Metadata Notification Broker.

1685    **3.54.4.1.2 Message Semantics**

The format of the Notify message used in the Document Metadata Publish transaction is identical to the format of the Full Notification structure of the Notify message used in the Document Metadata Notify transaction. The format is defined in ITI TF-2b: 3.53.4.1.2.

1690    Note that there is no subscription information in the Notify message in the Publish transaction.

#### 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.

1695

#### 3.54.4.1.4 Example

```
<?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">
```

1700

```
1705    xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
        xmlns:ihe="urn:ihe:iti:pub-sub:2008"
        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:pub-
        sub:2008 ../schema/IHE/XDS.b_PublishSubscribe.xsd urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0
        ../schema/ebRS/rim.xsd">
1710    <s:Header>
        <a:Action>http://docs.oasis-open.org/wsn/bw-2/NotificationConsumer/Notify</a:Action>
        <a:MessageID>382dcda-8e87-9fdf-8446-48fd83bca93b</a:MessageID>
        <a:To>https://NotificationBroker/xdsBpublish</a:To>
    </s:Header>
    <s:Body>
        <wsnt:Notify>
            <wsnt:NotificationMessage>
                <wsnt:ProducerReference>
                    <a:Address>https://DocumentSource</a:Address>
                </wsnt:ProducerReference>
                <wsnt:Message>
                    <lcm:SubmitObjectsRequest>
                        <rim:RegistryObjectList>
                            <!-- The list of extrinsic objects -->
                            <rim:ExtrinsicObject id="Document01" mimeType="text/xml"
1720 objectType="urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1">
                            ...
                            </rim:ExtrinsicObject>
                        </rim:RegistryObjectList>
                    </lcm:SubmitObjectsRequest>
                </wsnt:Message>
            </wsnt:NotificationMessage>
        </wsnt:Notify>
    </s:Body>
</s:Envelope>
```

1735 **3.54.5 Security Considerations**

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:

- 1740
- 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)

1745 **3.54.5.1 Audit Record Considerations**

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:

|  | <b>Field Name</b>            | <b>Opt</b> | <b>Value Constraints</b>                                      |
|--|------------------------------|------------|---|
| <b>Event</b><br><i>AuditMessage/<br/>EventIdentification</i>   | EventID                      | M          | EV(110107, DCM, “Import”)                                     |
|  | EventActionCode              | M          | “C” (Create)  |
|  | <i>EventDateTime</i>         | M          | <i>not specialized</i>  |
|  | <i>EventOutcomeIndicator</i> | M          | <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>Human Requestor (0..n)</b>                                  |                              |            |   |
| <b>Audit Source (Document Metadata Publisher) (1)</b>          |                              |            |   |
| <b>Patient (0..1)</b>  |                              |            |   |
| <b>Document (1..n)</b>   |                              |            |   |

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Where:

|   |                            |   |  |
|---|----------------------------|---|--|
| <b>Source</b><br><i>AuditMessage/<br/>ActiveParticipant</i> | UserID                     | M | When WS-Addressing is used: <From/>  |
|   | <i>AlternativeUserID</i>   | M | the process ID as used within the local operating system in the local system logs. |
|   | <i>UserName</i>            | U | <i>not specialized</i>   |
|   | UserIsRequestor            | M | “false”  |
|   | RoleIDCode                 | M | EV(110153, DCM, “Source”)  |
|   | NetworkAccessPointTypeCode | M | “1” for machine (DNS) name, “2” for IP address                                     |
|   | NetworkAccessPointID       | M | The machine name or IP address, as specified in RFC 3881.                          |

|  |                            |   |   |
|--|----------------------------|---|---|
| <b>Destination</b><br><i>AuditMessage/<br/>ActiveParticipant</i> | UserID                     | C | When WS-Addressing is used: <ReplyTo/>                    |
|  | <i>AlternativeUserID</i>   | U | <i>not specialized</i>                                    |
|  | <i>UserName</i>            | U | <i>not specialized</i>                                    |
|  | UserIsRequestor            | M | “true”  |
|  | RoleIDCode                 | M | EV(110152, DCM, “Destination”)                            |
|  | NetworkAccessPointTypeCode | M | “1” for machine (DNS) name, “2” for IP address            |
|  | NetworkAccessPointID       | M | The machine name or IP address, as specified in RFC 3881. |

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

|   |                              |   |                         |
|---|------------------------------|---|-------------------------|
| <b>Audit Source</b><br><i>AuditMessage/</i> | <i>AuditSourceID</i>         | U | <i>Not specialized.</i> |
|   | <i>AuditEnterpriseSiteID</i> | U | <i>not specialized</i>  |

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|                           |                            |   |                        |
|---------------------------|----------------------------|---|------------------------|
| AuditSourceIdentification | <i>AuditSourceTypeCode</i> | U | <i>not specialized</i> |
|---------------------------|----------------------------|---|------------------------|

|   |                                       |   |                                   |
|---|---------------------------------------|---|-----------------------------------|
| <b>Patient<br/>(if-known)<br/>(AuditMessage/<br/>ParticipantObjectIdentifi-<br/>cation)</b> | ParticipantObjectTypeCode             | M | “1” (Person)                      |
|   | ParticipantObjectTypeCodeRole         | M | “1” (Patient)                     |
|   | <i>ParticipantObjectDataLifeCycle</i> | U | <i>not specialized</i>            |
|   | ParticipantObjectIDTypeCode           | M | EV(2, RFC-3881, “Patient Number”) |
|   | <i>ParticipantObjectSensitivity</i>   | U | <i>not specialized</i>            |
|   | ParticipantObjectID                   | M | The patient ID in HL7 CX format.  |
|   | <i>ParticipantObjectName</i>          | U | <i>not specialized</i>            |
|   | <i>ParticipantObjectQuery</i>         | U | <i>not specialized</i>            |
|   | <i>ParticipantObjectDetail</i>        | U | <i>not specialized</i>            |

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|   |                                       |   |  |
|---|---------------------------------------|---|--|
| <b>Document<br/>(AuditMessage/<br/>ParticipantObjectIdentifi-<br/>cation)</b> | ParticipantObjectTypeCode             | M | “2” (System)                                 |
|   | ParticipantObjectTypeCodeRole         | M | “3” (report)                                 |
|   | <i>ParticipantObjectDataLifeCycle</i> | U | <i>not specialized</i>                       |
|   | ParticipantObjectIDTypeCode           | M | EV(9, RFC-3881, “Report Number”)             |
|   | <i>ParticipantObjectSensitivity</i>   | U | <i>not specialized</i>                       |
|   | ParticipantObjectID                   | M | The value of <ihe:DocumentUniqueId/>         |
|   | <i>ParticipantObjectName</i>          | C | If known the value of <ihe:HomeCommunityId/> |
|   | <i>ParticipantObjectQuery</i>         | U | <i>not specialized</i>                       |
|   | <i>ParticipantObjectDetail</i>        | U | <i>not specialized</i>                       |

### 3.54.5.1.2 Document Metadata Notification Broker audit message:

|   | Field Name                   | Opt | Value Constraints   |
|---|------------------------------|-----|---|
| <b>Event<br/>AuditMessage/<br/>EventIdentification</b>          | EventID                      | M   | EV(110106, DCM, “Export”)                                     |
|   | EventActionCode              | M   | “R” (Read)  |
|   | <i>EventDateTime</i>         | M   | <i>not specialized</i>  |
|   | <i>EventOutcomeIndicator</i> | M   | <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>  |                              |     |   |

Where:

|   |                            |   |   |
|---|----------------------------|---|---|
| <b>Source<br/>AuditMessage/<br/>ActiveParticipant</b> | UserID                     | M | When WS-Addressing is used: <From/>                       |
|   | AlternativeUserID          | U | <i>not specialized</i>                                    |
|   | <i>UserName</i>            | U | <i>not specialized</i>                                    |
|   | UserIsRequestor            | M | “false”   |
|   | RoleIDCode                 | M | EV(110153, DCM, “Source”)                                 |
|   | NetworkAccessPointTypeCode | M | “1” for machine (DNS) name, “2” for IP address            |
|   | NetworkAccessPointID       | M | The machine name or IP address, as specified in RFC 3881. |

|  |                            |   |  |
|--|----------------------------|---|--|
| <b>Destination</b><br><small>AuditMessage/<br/>ActiveParticipant</small> | UserID                     | C | When WS-Addressing is used: <ReplyTo/>   |
|  | AlternativeUserID          | M | the process ID as used within the local operating system in the local system logs. |
|  | UserName                   | U | <i>not specialized</i>   |
|  | UserIsRequestor            | M | “true”   |
|  | RoleIDCode                 | M | EV(110152, DCM, “Destination”)   |
|  | NetworkAccessPointTypeCode | M | “1” for machine (DNS) name, “2” for IP address                                     |
|  | NetworkAccessPointID       | M | The machine name or IP address, as specified in RFC 3881.                          |

|   |                       |   |                         |
|---|-----------------------|---|-------------------------|
| <b>Audit Source</b><br><small>AuditMessage/<br/>AuditSourceIdentification</small> | AuditSourceID         | U | <i>Not specialized.</i> |
|   | AuditEnterpriseSiteID | U | <i>not specialized</i>  |
|   | AuditSourceTypeCode   | U | <i>not specialized</i>  |

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|   |                                |   |  |
|---|--------------------------------|---|--|
| <b>Document<br/>URI</b><br><small>(AuditMessage/<br/>ParticipantObjectIdentifi-<br/>cation)</small> | ParticipantObjectTypeCode      | M | “2” (System)                                 |
|   | ParticipantObjectTypeCodeRole  | M | “3” (report)                                 |
|   | ParticipantObjectDataLifeCycle | U | <i>not specialized</i>                       |
|   | ParticipantObjectIDTypeCode    | M | EV(9, RFC-3881, “Report Number”)             |
|   | 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 |
|------------------|

## 3.69 Create Destroy Pull Point

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

### 3.69.1 Scope

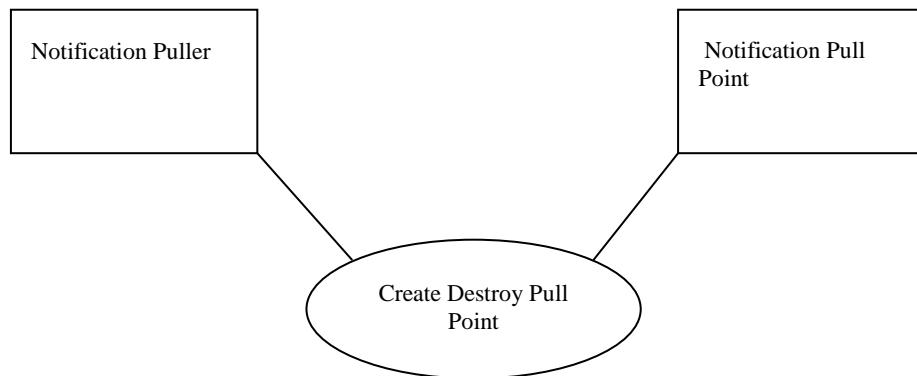
1770

This transaction involves a Request by the Notification Puller actor to the Notification Pull Point actor 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.

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

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### 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. |

1780

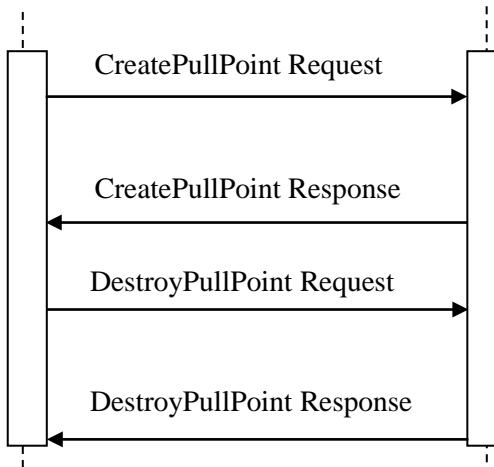
### 3.69.3 Referenced Standards

- 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
- WS-BaseFaults
- IHE ITI TF-2x: Appendix V
- WS-Addressing OASIS Standard

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### 3.69.4 Interaction Diagram

Notification Puller                              Notification Pull Point



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#### 3.69.4.1 CreatePullPoint Request message

A Notification Pull Point actor creates a Pull Point resource in response to each CreatePullPoint Request and collects all notifications destined for the requesting Notification Puller actor.

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Within the Notification Pull Point actor, each Pull Point resource allows the storing and managing of notifications.

A Pull Point resource is associated with a Notification Puller actor. A Pull Point resource is an abstract concept that creates a relationship between a Notification Puller actor and notifications stored for that actor in the Pull Point actor.

1800

The Notification Pull Point actor serves as a Pull Point resource “factory” in processing CreatePullPoint Request messages. It can be asked to create Pull Point resources by many Notification Puller actors. The Notification Pull Point actor can manage many Pull Point resources for each Notification Puller actor.

1805

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

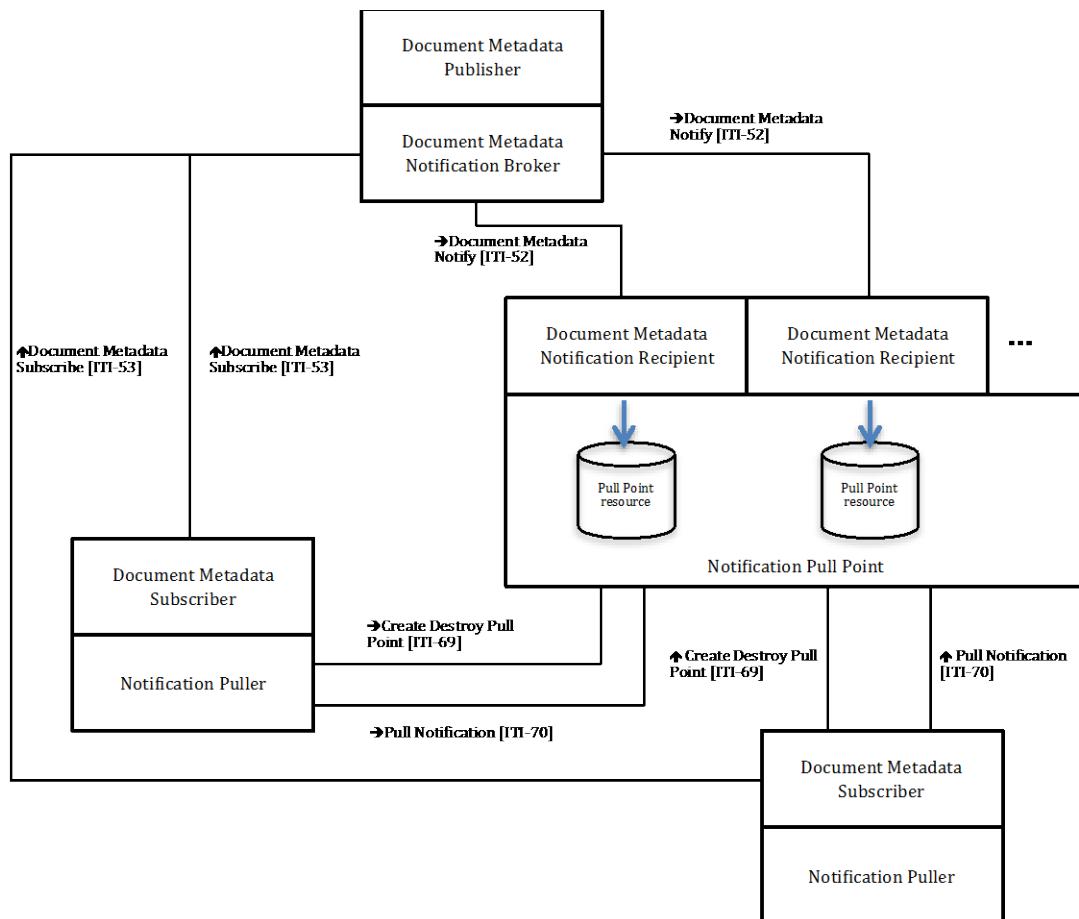
1810

If many Notification Puller actors are involved in the notification system, the Notification Pull Point actor is grouped with many Document Metadata Notification Recipient actors (see figure 3.69.4.1-1). When a Notification Puller actor sends a CreatePullPoint Request message, the Notification Pull Point actor returns an endpoint in the CreatePullPoint Response message. This endpoint is associated with a Document Metadata Notification Recipient actor. 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 actor.

1815 The Notification Puller actor 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.



1820

**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 actor.

1825 **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 actor, but is used only as trigger for internal subsequent actions.

- 1830 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**

- Upon receipt of the CreatePullPoint Request, the Notification Pull Point actor SHALL create a new Pull Point resource. The Document Metadata Notification Recipient/Notification Pull Point actor 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 actor when it is no longer capable of accumulating notifications is out of scope for this profile.
2. If the Notification Pull Point actor 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.

**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>
```

1850 **3.69.4.2 CreatePullPoint Response message**

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

**3.69.4.2.1 Trigger Events**

- 1855 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**

- 1860 The CreatePullPoint Response shall comply with the requirements in the WS-BaseNotification standard.

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:

- 1865 /wsnt:CreatePullPointResponse/wsnt:PullPoint.

- 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 actor that is grouped with the Notification Pull Point actor.

**3.69.4.2.3 Expected Actions**

- 1875 The CreatePullPoint Response message provides to the Notification Puller actor the endpoint needed for creating subscriptions to the Document Metadata Notification Broker actor. The same endpoint SHALL be used for the pulling of the notification stored by the Notification Pull Point actor 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>
```

1880 **3.69.4.3 DestroyPullPoint Request message**

If the Notification Puller actor 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 actor.

1885 **3.69.4.3.1 Trigger Events**

This message is created when the Notification Puller actor 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 actor grouped with the Notification Puller actor starts the process for unsubscribe filters created using the Pull Point resource endpoint as target for notifications created before to start the destruction.

**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**

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

If the Notification Pull Point actor 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 actor, it SHALL send a fault specified by the WS-Resource [WS-Resource] specification:

- 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:
- 1910     • UnableToDestroyPullPointFault.

#### **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>
```

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#### **3.69.4.4 DestroyPullPoint Response message**

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

##### **3.69.4.4.1 Trigger Events**

1920 If the DestroyPullPoint Request message is successfully processed, the Notification Pull Point actor SHALL respond with the DestoryPullPoint Response message.

##### **3.69.4.4.2 Message Semantics**

The DestroyPullPoint Response shall comply with the requirements in the WS-BaseNotification standard. The WS-Addressing [action] Message Addressing Property SHALL contain the URI:

1925 http://docs.oasis-open.org/wsn/bw-2/PullPoint/DestroyPullPointResponse.

##### **3.69.4.4.3 Expected Actions**

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

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

1930

```
<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

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

1935 The risks connected to this transaction are:

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 actor, because the Broker recognizes as a reputable actor the Document Metadata Notification Recipient actor.

- Mitigation:
  - 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

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

1950 **3.69.5.1.1 Notification Pull Point audit message**

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

|   |                             |   |  |
|---|-----------------------------|---|--|
| Source:<br>AuditMessage/ActiveParticipant (1)                 | UserID                      | M | The content of the <wsa:ReplyTo/> element  |
|   | AlternativeUserID           | U | <i>not specialized</i>   |
|   | UserName                    | U | <i>not specialized</i>   |
|   | UserIsRequestor             | M | "true"   |
|   | 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, as specified in RFC 3881                             |
| <b>Destination:</b><br>AuditMessage/<br>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 |
|   | UserName                    | U | not specialized  |
|   | UserIsRequestor             | M | "false"  |
|   | 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, as specified in RFC 3881                             |
| <b>Human Requestor</b>  | UserID                      | M | The person who wants to create (or destroying) a Pull Point resource                 |

|  |                            |    |                 |
|--|----------------------------|----|-----------------|
|  | AlternativeUserID          | U  | not specialized |
|  | UserName                   | U  | not specialized |
|  | UserIsRequestor            | M  | not specialized |
|  | RoleIDCode                 | M  | not specialized |
|  | NetworkAccessPointTypeCode | NA |                 |
|  | NetworkAccessPointID       | NA |                 |

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|   |                                       |   |                                    |
|---|---------------------------------------|---|------------------------------------|
| <b>Pull Point</b><br>(AuditMessage/ParticipantObjectIdentification) | ParticipantObjectTypeCode             | M | <b>2” (SYSTEM)</b>                 |
|   | ParticipantObjectTypeCodeRole         | M | 4” (Resource)                      |
|   | <i>ParticipantObjectDataLifeCycle</i> | U | <i>not specialized</i>             |
|   | ParticipantObjectIDTypeCode           | M | EV(12, RFC-3881, “URI”)            |
|   | <i>ParticipantObjectSensitivity</i>   | U | <i>not specialized</i>             |
|   | <i>ParticipantObjectID</i>            | M | The URL of the Pull Point resource |
|   | <i>ParticipantObjectName</i>          | U | <i>not specialized</i>             |
|   | <i>ParticipantObjectQuery</i>         | U | <i>not specialized</i>             |
|   | <i>ParticipantObjectDetail</i>        | U | <i>not specialized</i>             |

### 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<br><b>C = Create</b> (in case of creation of the Pull Point)<br>or<br><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    | <i>not specialized</i>   |
|  | EventTypeCode         | M    | EV("ITI-69", "IHE Transactions", "Create Destroy Pull Point")  |
| Source (Notification Puller) (1)           |                       |      |  |
| humanRequestor (0..1)                      |                       |      |  |
| Destination (Notification Pull Point ) (1) |                       |      |  |
| Pull Point (1)                             |                       |      |  |
| Human Requestor (0..1)                     |                       |      |  |

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

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

| <b>Destination:</b>                    |                            |   |  |
|--|----------------------------|---|--|
| AuditMessage/<br>ActiveParticipant (1) | UserID                     | M | Metadata Notification Pull Point SOAP URI                |
|  | AlternativeUserID          | U | not specialized  |
|  | UserName                   | U | not specialized  |
|  | UserIsRequestor            | M | “false”  |
|  | RoleIDCode                 | M | EV (110152, DCM, “Destination”)                          |
|  | NetworkAccessPointTypeCode | U | “1” for machine (DNS) name “2” for IP address            |
|  | NetworkAccessPointID       | U | The machine name or IP address, as specified in RFC 3881 |

|  |                            |    |   |
|--|----------------------------|----|---|
| <b>Human Requestor<br/>(if known)<br/>(0..1)</b> | UserID                     | M  | The person that wants to create (or destroying) a Pull Point resource |
|  | AlternativeUserID          | U  | not specialized   |
|  | UserName                   | U  | not specialized   |
|  | UserIsRequestor            | M  | not specialized   |
|  | RoleIDCode                 | M  | not specialized   |
|  | NetworkAccessPointTypeCode | NA |   |
|  | NetworkAccessPointID       | NA |   |

|   |                                |   |                                    |
|---|--------------------------------|---|------------------------------------|
| <b>Pull Point</b><br>(AuditMessage/ParticipantObjectIdentification) | ParticipantObjectTypeCode      | M | <b>2” (SYSTEM)</b>                 |
|   | ParticipantObjectTypeCodeRole  | M | 4” (Resource)                      |
|   | ParticipantObjectDataLifeCycle | U | <i>not specialized</i>             |
|   | ParticipantObjectIDTypeCode    | M | V(12, RFC-3881, “URI”)             |
|   | ParticipantObjectSensitivity   | U | <i>not specialized</i>             |
|   | ParticipantObjectID            | M | The URL of the Pull Point resource |
|   | ParticipantObjectName          | U | <i>not specialized</i>             |
|   | ParticipantObjectQuery         | U | <i>not specialized</i>             |
|   | ParticipantObjectDetail        | U | <i>not specialized</i>             |

1965 **3.69.5.1.3 Notification Pull Point actor Specific Security Considerations**

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

1970 *Add Section 3.70*

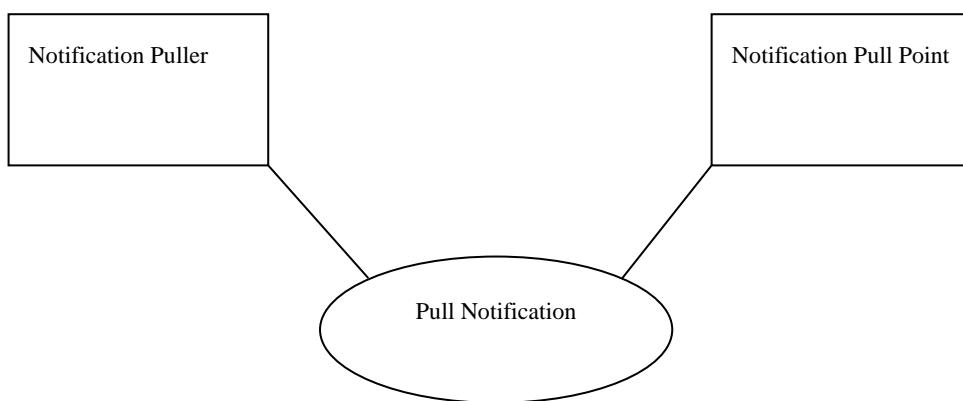
## 3.70 Pull Notification

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

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

### 3.70.2 Actor Roles



**Actor:** Notification Puller

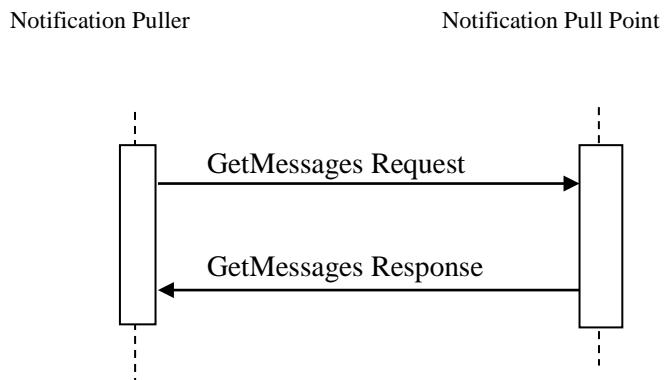
|               |   |
|---------------|---|
| <b>Role:</b>  | Sends a request to the Notification Pull Point actor for pending notifications stored in a Pull Point resource. |
| <b>Actor:</b> | Notification Pull Point   |
| <b>Role:</b>  | Responds to the request to deliver pending messages for the Notification Puller actor.                          |

1985

### 3.70.3 Referenced Standards

- OASIS Web Services Notification Family of standards
  - WS-BaseNotification 1.3 OASIS standard
  - WS-BrokeredNotification 1.3 OASIS Standard
- 1990
- WS-BaseFaults
  - WS-Topics 1.3 OASIS Standard
  - IHE ITI TF-2x: Appendix V
  - WS-Addressing OASIS Standard

### 3.70.4 Interaction Diagram



1995

#### 3.70.4.1 GetMessages Request message

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

### 3.70.4.1.1 Trigger Events

2000 If the Notification Puller actor 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

2005 The GetMessages Request SHALL comply with the requirements in the WS-BaseNotification standard.

This is a request message to the Notification Pull Point actor 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>.

2010 The components of the GetMessages request are:

- **/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 actor the request message is processed. The Pull Point actor shall respond to the Notification Puller actor immediately when the request is processed, returning content stored at that time without waiting for other notifications to be accumulated.
- **/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 actor, it processes the request message. There are three possibilities:

1. ***The Notification Pull Point resource has no notifications messages stored.*** The Notification Pull Point actor SHALL respond with a GetMessages Response message containing zero Notification Response Messages
2. ***The Notification Pull Point resource has one notification messages stored.*** The Notification Pull Point actor 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 actor is required to start another Notification Pull transaction in order to retrieve all notifications.

- 2035      4. ***The Pull Point resource is unable to respond to the request.*** The Notification Pull Point actor 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 actor cannot return notifications messages for some unspecified reasons
- 2040

#### **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>
```

- 2045      **3.70.4.2 GetMessages Response message**

If the Notification Pull Point actor 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**

- 2050      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 actor.

##### **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>.

- 2055      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.

- 2060
- **/wsnt:GetMessagesResponse/wsnt:NotificationMessage:** The content of this component is a Notification Message. The Notification Message component is described as part of the Notify message defined in the Document Metadata Notify transaction [ITI-53]. The GetMessagesResponse 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.
- 2065

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.

2070

**3.70.4.2.3 Expected Actions**

The Notification Puller actor SHALL accept the GetMessages Response 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.

2075

#### 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

2080 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)

2085 Additionally, it is recommended that the Notification Pull transaction be associated with a SAML assertion so that the Notification Puller actor 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**

2090 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 actor to query for instances stored in the Pull Point resource.

#### **3.70.5.1.1 Notification Puller audit message**

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

2095

|   | <b>Field Name</b>            | <b>Opt</b> | <b>Value Constraints</b>                                     |
|---|------------------------------|------------|--|
| <b>Event</b><br><i>AuditMessage/EventIdentification</i> | EventID                      | M          | EV(110112, DCM, “Query”)                                     |
|   | EventActionCode              | M          | “E” (Execute)  |
|   | <i>EventDateTime</i>         | M          | <i>not specialized</i>                                       |
|   | <i>EventOutcomeIndicator</i> | M          | <i>not specialized</i>                                       |
|   | EventTypeCode                | M          | <b>EV(“ITI-70”, “IHE Transactions”, “Pull Notification”)</b> |
| <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><br><i>AuditMessage/ActiveParticipant</i> | UserID                     | M | The content of the <wsa:ReplyTo/> element.   |
|  | AlternativeUserID          | M | The process ID as used within the local operating system in the local system logs. |
|  | <i>UserName</i>            | U | <i>not specialized</i>   |
|  | UserIsRequestor            | M | <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, as specified in RFC 3881.                          |

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

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|  |                                   |   |   |
|--|-----------------------------------|---|---|
| <b>Destination</b><br><small>AuditMessage/<br/>ActiveParticipant</small> | UserID                            | M | SOAP endpoint URI.  |
|  | <i>AlternativeUserID</i>          | U | <i>not specialized</i>                                    |
|  | <i>UserName</i>                   | U | <i>not specialized</i>                                    |
|  | UserIsRequestor                   | M | <i>not specialized</i>                                    |
|  | RoleIDCode                        | M | EV(110152, DCM, “Destination”)                            |
|  | <i>NetworkAccessPointTypeCode</i> | M | “1” for machine (DNS) name, “2” for IP address            |
|  | <i>NetworkAccessPointID</i>       | M | The machine name or IP address, as specified in RFC 3881. |

|  |                                       |   |                                   |
|--|---------------------------------------|---|-----------------------------------|
| <b>Patient</b><br><small>AuditMessage/<br/>ActiveParticipant</small> | ParticipantObjectTypeCode             | M | “1” (Person)                      |
|  | ParticipantObjectTypeCodeRole         | M | “1” (Patient)                     |
|  | <i>ParticipantObjectDataLifeCycle</i> | U | <i>not specialized</i>            |
|  | ParticipantObjectIDTypeCode           | M | EV(2, RFC-3881, “Patient Number”) |
|  | ParticipantObjectSensitivity          | U | <i>not specialized</i>            |
|  | <b><i>ParticipantObjectID</i></b>     | M | The patient ID in HL7 CX format.  |
|  | ParticipantObjectName                 | U | <i>not specialized</i>            |
|  | <b><i>ParticipantObjectQuery</i></b>  | U | <i>not specialized</i>            |
|  | ParticipantObjectDetail               | U | <i>not specialized</i>            |

|   |   |   |  |
|---|---|---|--|
| <b>Document</b><br><small>AuditMessage/<br/>ActiveParticipant</small> | ParticipantObjectTypeCode                 | M | “2” (system object)                                  |
|   | ParticipantObjectTypeCodeRole             | M | “1” (Patient)  |
|   | <i>ParticipantObjectDataLifeCycle</i>     | U | <i>not specified</i>                                 |
|   | <b><i>ParticipantObjectIDTypeCode</i></b> | M | EV(“ITI-70”, “IHE Transactions”, Pull Notification”) |
|   | ParticipantObjectSensitivity              | U | <i>not specified</i>                                 |

|  |                                |   |  |
|--|--------------------------------|---|--|
|  | <i>ParticipantObjectID</i>     | M | The value of <ihe:DocumentUniqueID>          |
|  | ParticipantObjectName          | C | If known the value of <ihe:HomeCommunityID/> |
|  | <i>ParticipantObjectQuery</i>  | M | <i>not specified</i>                         |
|  | <i>ParticipantObjectDetail</i> | C | <i>not specified</i>                         |

### 3.70.5.1.2 Notification Pull Point audit message

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|  | <b>Field Name</b>            | <b>Opt</b> | <b>Value Constraints</b>                              |
|--|------------------------------|------------|---|
| <b>Event</b><br><i>AuditMessage/<br/>EventIdentification</i> | EventID                      | M          | EV(110112, DCM, “Query”)                              |
|  | EventActionCode              | M          | “E” (Execute)   |
|  | <i>EventDateTime</i>         | M          | <i>not specialized</i>                                |
|  | <i>EventOutcomeIndicator</i> | M          | <i>not specialized</i>                                |
|  | 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><br><i>AuditMessage/<br/>ActiveParticipant</i>                             | UserID                            | M  | The content of the <wsa:ReplyTo> element.  |
|   | AlternativeUserID                 | M  | The process ID as used within the local operating system in the local system logs. |
|   | <i>UserName</i>                   | U  | <i>not specialized</i>   |
|   | UserIsRequestor                   | M  | <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, as specified in RFC 3881.                          |
| <b>Human<br/>Requestor<br/>(if known)</b><br><i>AuditMessage/<br/>ActiveParticipant</i> | UserID                            | M  | Identity of the human that initiated the transaction.                              |
|   | <i>AlternativeUserID</i>          | U  | <i>not specialized</i>   |
|   | <i>UserName</i>                   | U  | <i>not specialized</i>   |
|   | UserIsRequestor                   | M  | <i>not specialized</i>   |
|   | RoleIDCode                        | U  | Access Control role(s) the user holds that allows this transaction.                |
|   | <i>NetworkAccessPointTypeCode</i> | NA |  |
|   | <i>NetworkAccessPointID</i>       | NA |  |

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|  |                            |   |   |
|--|----------------------------|---|---|
| <b>Destination</b>                         | UserID                     | M | SOAP endpoint URI.  |
| <i>AuditMessage/<br/>ActiveParticipant</i> | <i>AlternativeUserID</i>   | U | <i>not specialized</i>                                    |
|  | <i>UserName</i>            | U | <i>not specialized</i>                                    |
|  | UserIsRequestor            | M | <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, as specified in RFC 3881. |

|  |                                       |   |                                   |
|--|---------------------------------------|---|-----------------------------------|
| <b>Patient</b>                             | ParticipantObjectTypeCode             | M | “1” (Person)                      |
| <i>AuditMessage/<br/>ActiveParticipant</i> | ParticipantObjectTypeCodeRole         | M | “1” (Patient)                     |
|  | <i>ParticipantObjectDataLifeCycle</i> | U | <i>not specialized</i>            |
|  | ParticipantObjectIDTypeCode           | M | EV(2, RFC-3881, “Patient Number”) |
|  | ParticipantObjectSensitivity          | U | <i>not specialized</i>            |
|  | <b>ParticipantObjectID</b>            | M | The patient ID in HL7 CX format.  |
|  | ParticipantObjectName                 | U | <i>not specialized</i>            |
|  | <b>ParticipantObjectQuery</b>         | U | <i>not specialized</i>            |
|  | ParticipantObjectDetail               | U | <i>not specialized</i>            |

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

### 3.70.5.1.3 Metadata Notification Pull Point Specific Security Considerations

- 2115 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.