Foreword

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

This supplement is published on January 5, 2015 for public comment. Comments are invited and can be submitted at http://www.ihe.net/ITI_Public_Comments. In order to be considered in development of the trial implementation version of the supplement, comments must be received by February 6, 2015.

This supplement describes changes to the existing technical framework documents.

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

 Amend Section X.X by the following:

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

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

Information about the IHE IT Infrastructure domain can be found at: http://ihe.net/IHE_Domains.

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

The current version of the IHE IT Infrastructure Technical Framework can be found at: http://ihe.net/Resources/Technical_Frameworks.
CONTENTS

Introduction ................................................................................................................................. 4
    General Approach ................................................................................................................ 4
    Open Issues and Questions .............................................................................................. 5

Closed Issues .......................................................................................................................... 5

Volume 1 – XDW Profile ........................................................................................................ 6

30.2 Cross-Enterprise Document Workflow Profile Options ............................................. 6
    30.2.1 Cross-Community with XDR Option ..................................................................... 6
    30.2.2 Cross-Community with XCDR Option ................................................................. 7

30.3 XDW Actor Grouping and Profile Interactions ......................................................... 7
    30.3.1 Grouping with XDS ............................................................................................... 7
    30.3.2 Grouping with XDR .............................................................................................. 8
    30.3.3 Grouping with XDM ............................................................................................. 8
    30.3.4 Grouping with XCA and XCDR ......................................................................... 8

E.11 Deployment Models for XDW ...................................................................................... 10
    E.11.1 Deployment Model for XDW used in an XDR environment ............................. 10
    E.11.2 Deployment Model for XDW used in an XDM environment ............................. 11
    E.11.3 Deployment Model for XDW used in an XDS environment ............................. 12
    E.11.4 Two Deployment Models for XDW used in a Cross-Community environment using
        XCA and XCDR ............................................................................................................ 12
    E.11.4.1 XDW Workflow Documents are stored and updated in the XDS Affinity
        Domain where initially created .............................................................................. 13
    E.11.4.2 XDW Workflow Document are stored and updated in a dedicated XDS
        Affinity Domain .......................................................................................................... 15

80
**Introduction**

This supplement enables the use of XDW in a Cross-community document sharing environment where the XCA and XCDR Profiles are used. This supplement extends the XDW Supplement with a number of additions to enable the support of the Cross-Enterprise Workflow Document (XDW) Profile in Cross-community environments where the XCA and XCDR profiles are used.

Note: The XCDR Profile is issued for Public Comment at the same time as this supplement.

This supplement includes two major parts that are interrelated.

1. The first part extends Cross-Enterprise Document Workflow (XDW) by defining new options explaining grouping with XDR, XCA and XCDR which enables Cross-Community workflows.

2. The second part describes a number of deployment models where multiple communities are interconnected and collaborate to perform Cross-Enterprise Document Workflow.

These two parts are depicted in the figure below, as well as references to the XDW Supplement upon which this supplement builds and the Cross-Community Document Reliable interchange (XCDR) Supplement:

**General Approach**

The figure below depicts an example of cross-community workflow using the XDW Profile. This is one of the deployment models where the XDW document is created in a community A. It is accessed and updated from a remote Community B.
Open Issues and Questions

Cross-Community with XDR and Cross-Community with XCDR Options: The use of two options was analyzed and selected, despite the fact that it provides the ability to support cross-community alone without the ability to operate within an XDS Community which is the most common use of XDW today.

Reviewers are asked if this flexibility may make the deployment of XDW extended from single XDS Communities to cross-community more or less complex.

Status of Deployment Models: Should the actor roles within the deployment models be considered “informative” or “normative” in nature? They have been made normative in this draft for public comment, as it has been considered that the design of the XDW Options has been intended to fit specifically with the support of these two models.

Closed Issues

Deployment models: A number of deployment models have been considered. CLOSED: After analysis, two of them appeared as the two most viable alternatives:

- The deployment model where XDW Workflow Documents are stored and updated in the community where they have been initially created (see Section E.11.4.1)
- The deployment model where all XDW Documents are stored and updated in a dedicated community distinct from the community where they were initially created (see Section E.11.4.2)
Replace the option Table 30.2-1 of the IHE XDW Supplement in Volume 1 by:

### 30.2 Cross-Enterprise Document Workflow Profile Options

Options that may be selected for this Profile are listed in the Table 30.2-1 along with the Actors to which they apply.

<table>
<thead>
<tr>
<th>Actor</th>
<th>Options</th>
<th>Vol. &amp; Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content Creator</td>
<td>Cross-community with XDR Option</td>
<td>ITI TF-1: 30.2.3</td>
</tr>
<tr>
<td></td>
<td>Cross-community with XCDR Option</td>
<td>ITI TF-1: 30.2.4</td>
</tr>
<tr>
<td>Content Consumer</td>
<td>View Option (Note 1)</td>
<td>ITI TF-1: 30.2.1</td>
</tr>
<tr>
<td></td>
<td>Document Import Option (Note 1)</td>
<td>ITI TF-1: 30.2.2</td>
</tr>
<tr>
<td>Content Updater</td>
<td>View Option (Note 1)</td>
<td>ITI TF-1: 30.2.1</td>
</tr>
<tr>
<td></td>
<td>Document Import Option (Note 1)</td>
<td>ITI TF-1: 30.2.2</td>
</tr>
<tr>
<td></td>
<td>Cross-community with XDR Option</td>
<td>ITI TF-1: 30.2.3</td>
</tr>
<tr>
<td></td>
<td>Cross-community with XCDR Option</td>
<td>ITI TF-1: 30.2.4</td>
</tr>
</tbody>
</table>

Note 1: The Actor shall support at least one of these options

Add two new sections 30.2.3 and 30.2.4 in the IHE XDW Supplement in Volume 1:

### 30.2.1 Cross-Community with XDR Option

This option is used to send XDW Workflow documents in a cross-community environment. The Provide and Register Document Set-b [ITI-41] transaction is used to send XDW workflow documents to a target XDR Document Recipient. The target XDR Document Recipient is expected to be grouped with an XCDR Initiating Gateway (See Appendix E11 Section 4.1 and 4.2 for deployment models) in order to forward the document to a remote community using its XCDR responding Gateway.

A Content Creator or a Content Updater that supports the Cross-Community with XDR Option shall be able to:

- Be grouped with an XDR Document Source supporting the Home Community ID Option
- For a Content Creator, the homeCommunityId value used by the XDR Document Source shall be configurable and set to the Community used to store XDW workflow documents.
• For a Content Updater, The homeCommunityId value used by the XDR Document Source shall be the homeCommunityId of the community from which the XDW Workflow document was retrieved before being updated.

30.2.2 Cross-Community with XCDR Option

This Option is used to send XDW workflow documents in a cross-community environment. The XCDR Cross-Community Document Provide transaction is used to send XDW workflow documents to a target XCDR Responding Gateway. This Gateway may be serving a community that may not be using XDS internally (See Appendix E11 Section 4.1 and 4.2 for deployment models that take advantage of this option).

A Content Creator or a Content Updater that supports the Cross-Community with XCDR Option shall be able to:

• Be grouped with an XCDR Initiating Gateway
• For a Content Creator, the homeCommunityId value used by the XCDR Initiating Gateway shall be configurable and set to the Community used to store XDW workflow documents.
• For a Content Updater, The homeCommunityId value used by the XCDR Initiating Gateway shall be the homeCommunityId of the community from which the XDW Workflow document was retrieved before being updated.

Add at the end of section 30.3 Actor Grouping and Profile Interaction, of the IHE XDW Supplement in Volume 1XDW the following:

30.3 XDW Actor Grouping and Profile Interactions

A XDW Content Creator, Content Updater and Content Consumer shall be grouped with appropriate actors from the XDS, XDM, XDR, XCA and XCDR Profiles to exchange XDW Workflow Documents. The metadata used for document entries in document sharing or interchange has specific relationships or dependencies (which we call bindings, see ITI TF-3:5.4.6) to the content of the clinical document – a XDW Workflow Document.

The reader should be familiar with the various deployment models that may be used for XDW. These are discussed in ITI TF-1: Appendix E.11.

30.3.1 Grouping with XDS

When XDW is used in conjunction with XDS:

• an XDW Content Creator shall be grouped with:
  • an XDS Document Source;
• an XDW Content Updater shall be grouped with:
• an XDS Document Source with the Document Replacement Option;
• an XDS Document Consumer;
• an XDW Content Consumer shall be grouped with:
  • an XDS Document Consumer.

30.3.2 Grouping with XDR
When XDW is used in conjunction with XDR:
• an XDW Content Creator shall be grouped with:
  • an XDR Document Source
• an XDW Content Updater shall be grouped with:
  • an XDR Document Source
  • an XDR Document Recipient
• an XDW Content Consumer shall be grouped with:
  • an XDR Document Recipient.

30.3.3 Grouping with XDM
When XDW is used in conjunction with XDM:
• an XDW Content Creator shall be grouped with:
  • an XDM Portable Media Creator
• an XDW Content Updater shall be grouped with:
  • an XDM Portable Media Creator
  • an XDM Portable Media Importer
• an XDW Content Consumer shall be grouped with:
  • an XDM Portable Media Importer.

*Note: The support of Workflow spanning XDS, XDR and XDM environments is not explicitly addressed.*

30.3.4 Grouping with XCA and XCDR
When XDW is used in conjunction with XCA and XCDR, the XDW Content Creator and XDW Content Updater Actors shall support the cross-community options as specified below (See ITI TF-1: Appendix E.11.4 for the corresponding deployment models that may be used for XDW in cross-community environments).
When the XDW Content Creator Actor declares the **Cross-community with XDR Option**:  
- This enables the support of the ITI TF-1: Appendix E.11.4.4.2 deployment model  
- The XDW Content Creator shall be grouped with an XDR Document Source with the **Transmit Home Community ID Option**  
- Newly created XDW Documents are sent by the grouped Content Creator/Document Source to an XDR Document Recipient grouped with the XCDR Initiating gateway of the community  
- Any documents referenced by newly created XDW documents shall be available for query and retrieve from an XCA Responding Gateway.  
  
  Note: There are no restrictions regarding which communities the documents referenced by XDW Document are stored.  
  
  Note: It is expected that most implementations of XDW Content Creators would also support an XDS Document Source to operate both within a community (See Grouping with XDS Section 3.3.1) and across federated communities in the Model specified in ITI TF-1: Appendix E.11.4.4.2.

When an XDW Content Updater declares the **Cross-Community with XDR Option**:  
- This enables the support of both the ITI TF-1: Appendix E.11.4.4.1 and the ITI TF-1: Appendix E.11.4.4.2 deployment models  
- The XDW Content Updater shall be grouped with an XDR Document Source with the **Transmit Home Community ID Option**  
- Updated XDW Documents are sent by the grouped Content Updater/Document Source to an XDR Document Recipient grouped with the XCDR Initiating Gateway of the community  
- Any documents referenced by updated XDW documents shall be available for query and retrieve from an XCA Responding Gateway.  
  
  Note: There are no restrictions regarding which communities the documents referenced by XDW Document are stored.  
  
  Note: It is expected that most implementations of XDW Content Updaters would also support an XDS Document Source to operate both within a community (See Grouping with XDS Section 3.3.1) and across federated communities in the Model specified in ITI TF-1: Appendix E 11.4 4.1.

When an XDW Content Creator declares the **Cross-Community with XCDR Option**,  
- This enables the support of ITI TF-1: Appendix E.11.4.2 deployment model  
- The XDW Content Creator shall be grouped with an XCDR Initiating Gateway.  
- Any documents referenced by newly created XDW documents shall be available for query and retrieve through an XCA Responding Gateway.  
  
  Note: There are no restrictions regarding which communities the documents referenced by XDW Document are stored.  

When an XDW Content Updater declares the **Cross-Community with XCDR Option**:  

---

Rev. 1.0 – 2015-01-05   Copyright © 2015: IHE International, Inc.
This enables the support of both the ITI TF-1: Appendix E.11.4.4.1 and the ITI TF-1: Appendix E.11.4.2 deployment models.

The XDW Content Updater may be grouped with an XCDR Initiating Gateway.

Any documents referenced by updated XDW documents shall be available for query and retrieve through an XCA Responding Gateway.

Note: There are no restrictions regarding which communities the documents referenced by XDW Documents are stored.

---

**E.11 Deployment Models for XDW**

The Cross-Enterprise Document Workflow (XDW) Profile is a content profile that may be deployed over many diverse document sharing environments supported by a variety of XDR, XDM, XDS, XCDR and XCA profiles. Each one of these environments varies in complexity and they may be combined in a variety of architectures. Several of these environments are analyzed in this Appendix to allow the reader to better understand deployment models where XDW actors and actors from the underlying profiles are combined to support an architectural goal.

This appendix is normative.

**E.11.1 Deployment Model for XDW used in an XDR environment**

In this deployment model the XDW Document is communicated to the Content Consumer along with the input and output documents referenced in the XDW Document.
E.11.2 Deployment Model for XDW used in an XDM environment

In this deployment model the XDW Document is communicated to the Content Consumer along with the input and output documents referenced in the XDW Document as an XDM Zip Package.
E.11.3 Deployment Model for XDW used in an XDS environment

In this deployment model the XDW Document Creator or Updater Actor is grouped with an XDS Document Source to share XDW Workflow Instance by storing them in a Repository and indexing them in the XDS Document Registry.

Also, XDW Content Consumer or Content Updaters may query and retrieve XDW Documents along with the input and output documents referenced. The workflow may be updated and the corresponding updated XDW Document along with new referenced input or output document may be provided and registered in the XDS Repository and Registry. Finally another XDW Document Consumer may query and retrieve XDW Documents along with the input and output documents referenced.

E.11.4 Two Deployment Models for XDW used in a Cross-Community environment using XCA and XCDR

In these deployment models the XDW Document Creator or Updater Actor is grouped with an Actor that enables submission and/or access across communities. The two deployments models differ on the approach to the storage location of XDW Workflow Documents:

- XDW Workflow Documents are stored and updated in the community where they have been initially created (see E.11.4.1)
- All XDW Documents are stored and updated in a dedicated community distinct from the community where they were initially created (see E.11.4.2)
Each of these models is analyzed independently. Although not discussed in detail in this Appendix, these two models may be combined. At the time of configuration and deployment the XDW Actors are set up to support the chosen deployment model.

**E.11.4.1 XDW Workflow Documents are stored and updated in the XDS Affinity Domain where initially created**

In this deployment model, XDW Workflow Documents are stored and updated in the community where they have been initially created (A in Figure E.11.4.1-1). If systems supporting workflow participants from another community (B in Figure E.11.4.1-1) desire to engage in the workflow, these systems need the cross-community ability (from A to B in Figure E.11.4.1-1) to replace and deprecate the XDW Workflow Document in the community (A in Figure E.11.4.1-1) where they have been initially created.

- When an XDW document is initially created (along with referenced documents), the XDW document remains under the control of a single XDS Registry for its entire life-cycle (replacement, folder if used, race condition detection).

- A document consumer in another XDS Affinity Domain discovers a workflow of interest through the XCA Profile (steps 1 through 7 in the figure below). The document consumer may also access referenced documents using XCA.

- The XDS document source in XDS Affinity Domain B may create a new document (8) which is stored and registered in XDS Affinity Domain B and referenced in an updated XDW document.

- The Content Updater in XDS Affinity Domain B replaces (9) the previous XDW document using the Cross-gateway Provide and Register (10 and 11), storing it in XDS Affinity Domain A. All instances of the XDW document related to this workflow initiated in XDS Affinity Domain A remain under the control of the XDS Affinity Domain A XDS Registry for their entire life-cycle (including deprecation and replacement).

- A XDW Workflow Document may reference documents that have been created, stored and registered in any community. This may be documents that have been stored and registered in the same community as the one where the workflow document was initially created (A in Figure E.11.4.1-1), or from another community where systems supporting workflow participants from another community have engaged in the workflow (B in Figure E.11.4.1-1). Access to such documents is performed through the Cross Community Access Profile (XCA).
Figure E.11.4.1-1: XDW Workflow Documents are stored and accessed from the affinity domain where initially created

Transaction 10 relies on the Cross-Community-Document Reliable interchange (XCDR) Profile. The XCDR Profile extends the Provide and Register Document Set-b [ITI-41], to a Cross-Community environment. The inclusion in Transaction 9 of the homeCommunityId (pointing at XDS Affinity Domain A) allows the Initiating Gateway to route the request via the XCDR Profile to the correct XCDR Responding Gateway in order for the storage and registration in the Community A of the updated XDW Workflow Document.

It is important to note that an XDW Content Updater Actor in a community such as community B has to be grouped not only with an XDR Document Source as shown by the transactions from the above Figure E.11.4.1-1 to update XDW document created in other communities, but also with an XDS Document Source to update documents created in its own XDS Affinity Domain.

This is not exposed in Figure E.11.4.1-1 where the XDW Content Updater and the XDR Document Source, XDS Document Source and other actors are collapsed in a single swim lane.
E.11.4.2 XDW Workflow Document are stored and updated in a dedicated XDS Affinity Domain

In this deployment model XDW Workflow Documents are stored and updated in a dedicated community (XDS Affinity Domain C in Figure E.11.4.2-1) distinct from the community where they were initially created (A & B in Figure E.11.4.2-1). All systems, supporting workflow participants in another community desiring to engage in the workflow, need the cross-community ability to replace and deprecate the XDW Workflow Document in the community where it has been initially created.

XDW workflow documents are queried (4, 4b, 4c) and retrieved (5, 6, 6b) from XDS Affinity Domain C along with the referenced documents (7, 7b, 8, 9a, 9b and 9c).

These XDW workflow documents are created (1, 2 and 3) and updated (11, 12 and 13) using the Cross Gateway Document Provide transaction of the XCDR Profile.

Figure E.11.4.2-1: XDW Documents are stored and updated in a dedicated community distinct from the community where they were initially created.

Transactions (1 & 11) rely on XDR and transactions (2 and 12) rely on XCDR.
The inclusion in Transaction (1 and 11) of the homeCommunityId (pointing at XDS Affinity Domain C) allows the XCDR Initiating Gateway to route the request to the correct XCDR Responding Gateway in order for the storage and registration in the Community C of the updated XDW Workflow Document.

It is important to note that an XDW Content Creator (see community A) and the XDW Content Updater Actor (see community B) that would be designed to operate both in these two deployment model as well as within a single XDS Affinity Domain would have to be designed so that it may be configurable to operate grouped either with:

- an XDR Document Source as shown by the transactions from the above Figure E.11.4.2-1 to create and update XDW documents in community C
- an XDS Document Source to create or update XDW Documents manages within its own XDS Affinity Domain.