Understanding and Leveraging MU Stage 2 Optional Transports (SOAP)
Agenda

• MU2 Overview and Context

• Applicable Transport Standards for Certification

• Importance of Optional Standards
  • (SOAP & XDR/XDM for Direct)

• XDR and XDM for Direct Messaging

• RTM 1.0

• Discussion and Q/A
Meaningful Use Stage 2 Rule (MU2) Overview and Context

MU2 sets measurable objectives for Eligible Professionals (EPs) or Eligible Hospitals (EHs) / Critical Access Hospitals (CAHs) to obtain CMS incentives (CMS 495.6)

- MU2 objectives are categorized to reflect Health Outcomes Policy Priorities
- Pursuit of certain objectives within Care Coordination category involve using Certified EHR Technology that implements Transport standards

Meaningful Use objectives are the measurable benchmarks that EPs and EHs/CAHs must meet in adopting and using electronic health record (EHR) technology to qualify for Medicare and Medicaid incentive payments.
Summary from CMS Final Rule:

- As part of the Core Set of Measures, EPs, eligible hospitals and CAHs need to “electronically transmit” summary of care record during care transitions. These are further detailed for EPs at §495.6(j)(14)(ii)(A) and eligible hospitals and CAHs at §495.6(l)(11)(ii)(A).

- These objectives discuss the transport standards that are applicable and the corresponding certification criteria from the ONC S&CC 2014 edition.
Summary from ONC S&CC 2014 edition:

- § 170.314(b)(1) (Transitions of care – receive, display, and incorporate transition of care/referral summaries)

- § 170.314(b)(2) (Transitions of care – create and transmit transition of care/referral summaries)

  - **Transport Standards**
    - (Base Minimum) Direct Project Applicability Statement for Secure Health Transport
    - (Optional Standards – 1) Applicability Statement for Secure Health Transport specification and the XDR and XDM for Direct Messaging specification.
• 170.314(b)(1) and 170.314(b)(2) – Transitions of Care Transport Standards

  • (Base Minimum) Direct Project Applicability Statement for Secure Health Transport

  • (Optional Standards – 1) Applicability Statement for Secure Health Transport specification and the *XDR and XDM for Direct Messaging specification*.  

  • (Optional Standards – 2) Simple Object Access Protocol (SOAP)-Based Secure Transport Requirements Traceability Matrix (RTM) version 1.0 standard and the *XDR and XDM for Direct Messaging specification*.  

XDR and XDM for Direct as a Bridge capability

Information Exchange requiring conversion from SMTP + S/MIME to SOAP

Information Exchange requiring conversion from SOAP to SMTP + S/MIME

XDR + XDM for Direct Specification used for conversions
XDR and XDM for Direct as a Bridge capability Cont’d

Incoming SOAP Messages

Systems (HIE’s, HISP’s, EHR’s)
Supporting Direct endpoints

Outgoing SOAP Messages

Direct Endpoint 1

Direct Endpoint 2

Information Exchange requiring conversion from SOAP to SMTP + S/MIME

Information Exchange requiring conversion from SMTP + S/MIME to SOAP

XDR + XDM for Direct Specification used for conversions
Importance of the Optional Transport Standards

- Implementation of the Direct capability will require at a minimum
  - Technical Implementation that consists of conformance to the Direct Applicability statement (STA Implementation)
  - CA and RA Services to manage identities and certificates of Direct end points
  - Policies and processes that facilitate the operational aspects of the overall implementation
- Vendors providing CEHRT may not always provide CA and RA services
- Organizations may procure different services from different vendors
Implementing the optional transport standards enables CEHRT

• To participate in different HIE/HISP eco-systems in an agnostic manner
• Provides multiple deployment options for organizations
• Support multiple edge protocol options for organizations
XDR and XDM for Direct Messaging

Overview

- XDR and XDM for Direct Messaging specifies
  - Transport Conversion requirements to convert between SMTP and SOAP
  - Packaging Conversions requirements to convert from SMTP + S/MIME packages to XDR/XDM packages
  - How the XD* Metadata should be used for Direct Messaging
    - The required and optional metadata elements for XDR and XDM for Direct Messaging is different than the previously existing IHE XDR and XDM profiles
    - The “IHE Support for Limited Metadata Document Sources” is comparable to the XDR and XDM for Direct Messaging metadata requirements.
# XDR and XDM for Direct Messaging

## Overview Cont’d

<table>
<thead>
<tr>
<th>Senders</th>
<th>RFC5322+MIME</th>
<th>RFC5322+XDM</th>
<th>SOAP+XDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>RFC5322+MIME</td>
<td>• No conversion</td>
<td>• No conversion</td>
<td>• Transport Conversion</td>
</tr>
<tr>
<td>RFC5322+XDM</td>
<td>• No conversion</td>
<td>• No conversion</td>
<td>• Transport Conversion</td>
</tr>
<tr>
<td></td>
<td>• Receiver expected to be able to handle MIME packages</td>
<td>• Receiver expected to be able to handle XDM packages</td>
<td>• Metadata created</td>
</tr>
<tr>
<td>SOAP + XDR</td>
<td>• Transport Conversion</td>
<td>• Transport Conversion</td>
<td>• Metadata simply transformed</td>
</tr>
<tr>
<td></td>
<td>• Metadata simply transformed</td>
<td>• Metadata simply transformed</td>
<td>• Package delivered as XDM</td>
</tr>
<tr>
<td></td>
<td>• Package delivered as XDM</td>
<td>• Package delivered as XDM</td>
<td></td>
</tr>
</tbody>
</table>
• In order to support Direct Addressing requirements
  • locating the receivers and senders without opening the contents of the message

• Addressing Headers have been added to the SOAP envelope

Example
<direct:addressBlock xmlns:direct="urn:direct:addressing"
env:role="urn:direct:addressing:destination" env:relay="true">  
  <direct:from>mailto:entity1@direct.example.org</direct:from>  
  <direct:to>mailto:entity2@direct.example.org</direct:to>  
</direct:addressBlock>
### XDR and XDM for Direct Messaging – Transport Conversion Cont’d

**• SMTP to SOAP**

<table>
<thead>
<tr>
<th>Element</th>
<th>SMTP Source Fields</th>
<th>SOAP Destination Fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addressing Lists</td>
<td>SMTP TO command</td>
<td>Each TO address is mapped to a corresponding WS Address (Stored in intendedRecipient field), Optionally added to the (direct:to element in SOAP Header)</td>
</tr>
<tr>
<td></td>
<td>SMTP RCPT FROM command</td>
<td></td>
</tr>
<tr>
<td>Message ID</td>
<td>Message ID</td>
<td>populate the Message Id WS-Addressing Header elements.</td>
</tr>
<tr>
<td>Date</td>
<td>Date</td>
<td>Populate the submissionTime XD* metadata element of the SubmissionSet</td>
</tr>
</tbody>
</table>
### SOAP to SMTP

<table>
<thead>
<tr>
<th>Element</th>
<th>SOAP Source Fields</th>
<th>SMTP Destination Fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addressing Lists</td>
<td>SOAP Header values (direct:from and direct:to elements) if available. Always available in the XD* Metadata elements SubmissionSet.author SubmissionSet.intendedRecipient</td>
<td>SMTP TO command populated from the intendedRecipient field SMTP RCPT FROM command populated from the author field.</td>
</tr>
<tr>
<td>Message ID</td>
<td>Message ID WS-Addressing header</td>
<td>Message ID field</td>
</tr>
<tr>
<td>Date</td>
<td>SubmissionTime XD* metadata element from the Submission Set</td>
<td>Date field</td>
</tr>
</tbody>
</table>
XDR and XDM for Direct Messaging – Packaging Conversion

- RFC5322 to XDR
  - Each part of the RFC5322 message converted to a Document Entry
  - Text Part of the Email should be mapped to classCode Metadata of 56444-3 from LOINC indicating Healthcare communication
  - Base 64 encoded documents should be decoded prior to packaging them with SOAP
  - Create a Single Submission Set with association to each Document Entry
• Conversions from XDM to XDR

  • Construct a single XDR transaction for each XDM directory containing a metadata file

  • Read and interpret the Metadata.xml file of XDM package

  • Locate all document entries and correlate the URI property of the Document Entry to the corresponding source document

  • Reconstruct the Mime multipart documents using the source

  • Package the source documents as an XDR transaction
XDR and XDM for Direct Messaging – Packaging Conversion Cont’d

• Conversions from XDR to XDM
  
  • Extract the documents and SubmitObjectsRequest XML element
  
  • Construct INDEX.HTM and README.TXT following XDM guidelines
  
  • Create the IHE_XDM directory with a valid subdirectory containing all the XDR transaction contents
  
  • Each source file is placed in the directories with a unique file name and package multi-part documents as folders
  
  • Setup the URI property for each file to point to the appropriate file
  
  • Serialize the SubmitObjectsRequest XML element as METADATA.xml file
  
  • Finally package the structure as a zip file
XDR and XDM for Direct Messaging – Using XD* Metadata

- Metadata is used within XDR transactions to describe the content of the message to enable integration into workflows of CEHRT

- Metadata conformance Levels
  - Full XDS Metadata as described by the IHE specifications
  - Minimal metadata

- Conversion process should indicate the level of conformance using the SOAP header element
  - `<direct:metadata-level>minimal</direct:metadata-level>` or
  - `<direct:metadata-level>XDS</direct:metadata-level>`
## XDR and XDM for Direct Messaging – Document Entry Metadata

<table>
<thead>
<tr>
<th>Metadata Attribute</th>
<th>XDS Source (Full Metadata)</th>
<th>Minimal Metadata Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>author</td>
<td>R2</td>
<td>R2</td>
</tr>
<tr>
<td>classCode</td>
<td>R</td>
<td>R2</td>
</tr>
<tr>
<td>confidentialityCode</td>
<td>R</td>
<td>R2</td>
</tr>
<tr>
<td>creationTime</td>
<td>R</td>
<td>R2</td>
</tr>
<tr>
<td>entryUUID</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>formatCode</td>
<td>R</td>
<td>R2</td>
</tr>
<tr>
<td>healthcareFacilityTypeCode</td>
<td>R</td>
<td>R2</td>
</tr>
<tr>
<td>languageCode</td>
<td>R</td>
<td>R2</td>
</tr>
<tr>
<td>mimeType</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>patientId</td>
<td>R</td>
<td>R2</td>
</tr>
<tr>
<td>practiceSettingCode</td>
<td>R</td>
<td>R2</td>
</tr>
<tr>
<td>sourcePatientId</td>
<td>R</td>
<td>R2</td>
</tr>
<tr>
<td>sourcePatientInfo</td>
<td>R2</td>
<td>R2</td>
</tr>
<tr>
<td>typeCode</td>
<td>R</td>
<td>R2</td>
</tr>
<tr>
<td>uniqueId</td>
<td>R</td>
<td>R</td>
</tr>
</tbody>
</table>
## Metadata Attribute Extensions for Submission Set

<table>
<thead>
<tr>
<th>Metadata Attribute Extensions for Submission Set</th>
<th>XDS Source</th>
<th>Minimal Metadata Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>author subattribute: authorTelecommunication</td>
<td>N/A</td>
<td>R</td>
</tr>
<tr>
<td>intendedRecipient</td>
<td>O</td>
<td>R</td>
</tr>
</tbody>
</table>
RTM 1.0 - Overview

- [http://modularspecs.siframework.org/SOAP+based+Secure+Transport+Artifacts](http://modularspecs.siframework.org/SOAP+based+Secure+Transport+Artifacts)
  - Requirements Traceability Matrix

  - Architecture and Design Documents
  - Reference Implementation and Source Code
  - Demo bundles
  - Test Cases and Test Scripts

- RTM only specifies
  - Transport, Messaging and Security requirements (TLS, SAML, SOAP Envelope etc)
  - RTM does not specify any content requirements
  - RTM does not require any additional profiles
Discussion and Q/A


Google Groups: [nhindirect-discuss@googlegroups.com](mailto:nhindirect-discuss@googlegroups.com)

Implementers can post questions to [nhindirect-discuss@googlegroups.com](mailto:nhindirect-discuss@googlegroups.com)