Introduction to the HL7 Conformance Testing Program

Immunization Pilot & Developers Integration Lab

April 2014
Outline

- Overview of HL7 Testing Program
  - Rob Savage, PHER Workgroup & American Immunization Registry Association (AIRA)
- Overview of Conformance and Interoperability
  - Mario Hyland, AEGIS.net
- Getting Started in the DIL
  - Gretchen Hudson, AEGIS.net
- Executing Tests
- Reviewing Test Results
- Q&A Session
Data Exchange History

- In the beginning there were flat files
  - Many formats
  - Many value sets
  - No ability to query for records
  - Most data were entered via user interface
- IIS Community and CDC determined that one standard was needed
  - Standard structure for formatting data
  - Standard vocabulary
- HL7 was the standard chosen
  - an existing international standard
Adopting HL7 Had Big Impact

- Moved IIS to standard vocabulary and compatible data structure
- Improved data quality
- Increased participation by clinicians because
  - more patients were in the IIS
  - EHR sends immunization history to IIS
  - Consolidated record
Consolidation of Immunization

Patients with at least 1 immunization from Dane County Health Department, Wisconsin
Immunization Implementation Guide History
New Implementation Guide in May 2010

- CDC developed a new Implementation Guide to correct problems
- Provided full-time staff support
- Engaged American Immunization Registry Association (AIRA)
- Balloted through HL7 organization (For Comment)
- Based on HL7 Version 2.5.1
- Meaningful Use initiative selected the new Implementation Guides as one standard
Release 1.4 Published 8/1/12
### CMS survey of HL7 Activity

<table>
<thead>
<tr>
<th></th>
<th>Can Accept 2.5.1</th>
<th>Received VXU into production (2.3.1 or 2.5.1)</th>
<th>Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 2013</td>
<td>39</td>
<td>38</td>
<td>53</td>
</tr>
<tr>
<td>May 2013</td>
<td>41</td>
<td>39</td>
<td>53</td>
</tr>
<tr>
<td>June 2013</td>
<td>42</td>
<td>40</td>
<td>53</td>
</tr>
</tbody>
</table>

34 of 53 were able to accept VXU using CDC SOAP WSDL
Challenges facing Standards Adoption

*Definition of Interoperability (let’s agree to use IEEE).*

- Participants and Systems Not Ready for Interoperability, Certification or Accreditation
  - Dependence on Self-Attestation
- Understanding the Standards and Specifications
  - Common (or Consensus based) Interpretation.
- Conformance vs Interoperability
- Syntactic vs Semantic Interoperability
- Interoperability vs Continuous Interoperability
Conformance & Interoperability

- HL7 is offering a way to Mitigate Conformance and Interoperability Risk
  - Experience demonstrates Interoperability Challenges will be encountered

- Conformance & Interoperability Strategies
  - Standards based Testing (provide feedback loop to the WG)
  - Test Early and Test Often
  - Infuse Quality thru Testing into the Development Cycles thru TDD (Test Driven Development)
  - Embrace the goal of Continuous Interoperability thru process
Overview of HL7 Testing Program

- Provide the HL7 community with a 24/7, 365-days-per-year testing service
- Focuses on the Immunization message (VXU)
- Provide a technical proof of concept that demonstrated how the Developer’s Integration Lab (DIL) application will support testing of HL7 profiles
Overview of HL7 Testing Program

- Duteau Design Inc (DDI), with input from the PHER workgroup and AIRA, designed and documented twelve (12) test cases for the Immunization Profile
  - Use Case 1: Send Immunization History
  - Use Case 8: Acknowledge Receipt
  - Use Case 9: Report Error
Overview of HL7 Testing Program

- For the Pilot Phase, focus is on configuring the four (4) mandatory test cases
  - Each test case has approximately 200 automated rules configured that will analyze the message for conformance to the specifications.
  - In addition, approximately 50 rules specific to the test data prescribed in each test case will be configured.
Introduction to the DIL

- The Developers Integration Lab (DIL) allows for automated, internet-based interoperability testing against the HL7, IHE, and NwHIN specifications, compliant gateway implementations, and other gateway implementations as well.

- The DIL tests interoperability with other gateway implementations, hosting multiple gateway implementations for a user to send test messages using multiple testing scenarios.

- DIL Users have access to detailed test results as well as the messages evaluated as part of the test.
Introduction to the DIL

- The DIL provides for highly flexible and easily configurable test cases and rules.

- Test cases can be configured to test against any implementation guide. For example, a filter template can be created to test a specific element against the V2 standard and another filter template can be created to test the same element against the CDC Implementation Guide.
Getting Started in the DIL

- Key Steps for getting started with HL7 testing in the DIL are
  - Send an email to HL7_Support@aegis.net indicating interest in the testing program
  - Support staff will create an account in the DIL and distribute the target endpoint for the HL7 demo environment
  - For HTTP transport, no certificates are needed.
  - For HTTPS transport, AEGIS will generate the required certificates and send them to the testing organization along with instructions for installation
Executing Tests

- The basic steps for executing any test in the DIL are
  - Click “Set Up Test”: You must first identify the Service Set that contains the test(s) you wish to execute
  - Click “Test Execution”: This screen lists the Scenarios (groups of Test Cases) within the Service Set.
  - Click the hyperlink of the scenario that contains the test(s) you wish to execute
  - Execute the Scenario Case
  - Review the results
Getting Started with Testing

- Visit the HL7 website and click on the Conformance Testing link for details on
  - Testing readiness
  - Registering in the DIL
  - Test case documentation
Set Up Test
Test Execution – Initiator
# Test Execution – Initiator

## DIL Lab Platform

### HL7 Test Participant - Active Results

#### Scenario Execution Details

- **Scenario:** HL7: Immunization Test Case 11 – Basic Immunization - Single New Administration
- **Execution Unique Identifier:** 320140218.192312.504.3012
- **Service Set:** HL7: Immunization Test Case 1
- **Activated On:** Feb 18, 2014 04:25 PM
- **Last Test Executed:** [Missing]
- **Progress:** Pending

#### Test Results

The below listed Test Cases must be initiated by the Lab Participant. Refresh the page to view updated test results.

<table>
<thead>
<tr>
<th>Test Case</th>
<th>Current Result</th>
<th>Patient Id</th>
<th>Ris</th>
<th>Description</th>
<th>Action</th>
<th>Log Messages</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>HL7_Immunization Test Case 1</td>
<td>Pending</td>
<td>0000000001</td>
<td>RI0000</td>
<td>Test system</td>
<td>Clear Result</td>
<td><a href="#">Attach Document</a></td>
<td><a href="#">Specification</a></td>
</tr>
</tbody>
</table>

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[1]: [AEGIS.net, Inc. - Powerful Results. Delivered.SM](#)
Test Execution – Initiator

![DIL Lab Platform](image)

### Test Results

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<th>Current Result</th>
<th>PatientId</th>
<th>Ris</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HL7.CP.IZ-001-1 Basic VXX Single New Admin</td>
<td>Fail</td>
<td>0000000001</td>
<td>R00000 Testsystem</td>
<td>Demo: English (male), born 2015-05-14 was brought in by Mother Sally English for well child visit. They live at 9875 Fells Avenue, Evansville, IN 13402. Nurse Slicer at Dalihia Clinic (OCD/OH) administered the following on 2014-01-12: DTV &amp; Hep B HPV (Pediatric) lot # 393359 IM. The vaccinations were ordered by Dr. Mary Pediatrician who belongs to [add contact info].</td>
</tr>
</tbody>
</table>
Review the Results

![Gateway Exchanges](image-url)

**Case Result Details**

- **Service Set:** HL7:CP-I.001.1 Basic V3J Single New Admin
- **Scenario:** HL7:CP-I.001.1 Basic V3J Single New Admin - CP-I.001.1 Basic Immunization - Single New Administration
- **Test Case Name:** HL7:CP-I.001.1 Basic V3J Single New Admin
- **Description:** Davis Engil is male, born 10/14/2013 to her mother Sally Engil for a well child visit. They live at 9875 Felix Avenue, Evansville, IN 1...
- **Patient Id:** 0000000001
- **Execution Unique Identifier:** 3.20140325.160741.343.3012
- **Executed on:** Mar 25, 2014, 05:25:04 PM
- **Executed By:** HText
- **Current Status:** Fail

**Gateway Exchanges**

<table>
<thead>
<tr>
<th>Gateways</th>
<th>Message</th>
<th>Detail</th>
<th>Outcome</th>
<th>Ritter Template</th>
</tr>
</thead>
<tbody>
<tr>
<td>HL7 TestParta</td>
<td>R00000</td>
<td>Request</td>
<td>Fail</td>
<td>MSH1_Field Separator Validation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>MSH2_Encoding Characters Validation</td>
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<td></td>
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<td>MSH3_Sending Application Validation</td>
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<td>MSH4_Sending Facility Validation</td>
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<td></td>
<td>MSH5_Receiver Application Validation</td>
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<td></td>
<td></td>
<td>MSH6_Receiver Facility Validation</td>
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<td></td>
<td></td>
<td>MSH10_Message Control ID Validation</td>
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<td></td>
<td></td>
<td>MSH11_Processing ID Validation</td>
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<td></td>
<td>MSH12_Version ID Validation</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>MSH14_Continuation Pointer Validation</td>
</tr>
</tbody>
</table>

**Ritter Output**

- Valid value of I found for Field Separator (MSH-1).
- Value valid of "W" found for Encoding Characters (MSH-2).
- Value of "HL7TEST_SYSTEM" found for Sending Application.
- Value of "HL7TEST", "2.16.840.1.113883.3.609.16.2101", "IS0" found for Sending Facility, HL7TEST.
- Value of "DIL1101", "2.16.840.1.113883.3.609.16.1101", "IS0" found for Receiving Application.
- Value of "DIL1", "2.16.840.1.113883.3.609.14.1101", "IS0" found for Receiving Facility, HL7TEST.
- Found "MSG-20140204-204427-0747" for Message Control ID (MSH-10).
- Value of "P" found for Processing ID.
- Value of "2.5.1" found for Version ID.
- MSH-14 Optional field, Message Continuation Pointer, not found.
Review the Results
DIL Statistics

- The DIL provides **objective analysis** of health information standards implementation and exchange problem areas:

  DIL execution data record the root cause(s) of conformance/interoperability failures:
  - System/product failures
  - Test case definition defect
  - Specification lacks sufficient implementation guidance
Q & A Session
Survey

Dave Hamill will be sending a link to all attendees for a survey regarding this webinar. We greatly appreciate your feedback.

Thank you!
Contact Us

HL7_Support@aegis.net

Mario Hyland
Senior Vice President
mario.hyland@aegis.net
(703) 893–6020 x707
(301) 529–5466 (c)

David Hamill
Director
Project Management Office
dhamill@hl7.org
(734) 677–7777 x142