The Public Health Grid (PHGrid) and Nationwide Health Information Network (NHIN) CONNECT: What are they and How can they Support Cancer Surveillance Activities?

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Agenda

- Review Public Health GRID (PHGrid)
  - Background
  - Purpose and Goals
  - Review proposed activities
- Review NHIN’s CONNECT
  - Background
  - Purpose and Goals
  - Overview
  - Technical Architecture
  - Benefits of using CONNECT
  - Comparison to PHINMS
  - CDC and CONNECT
- Conclusion
What is PHGrid?
Public Health Grid (PHGrid) Activities
Goals and Objectives

- Provide a secure, easy-to-use national technical and social infrastructure for solving public health problems
- Develop an extremely low cost grid appliance
- Simplify web services development (drag & drop)
- Simplify data access and data exchange (drag & drop)
- Connect public health grid to other grids, and to other data sources, regardless (in other words, interoperate with everything)
- Recruit local & state health departments, HIEs, RHIOs, academic institutions, national data sources, medical centers, international public health partners, and vendors
Proposed Cancer Services for PHGrid

- Build a .NET / Globus bridge service
  - Cancer tools are written in .NET and Globus is java based. This service would be made generalizeable for other programs to use.
- Filtering tool for pathology and/or physician reporting that will identify reportable cases for Cancer Registries
- Tool for pathology laboratories to map/create a standard HL7 2.x format message from their local systems
- Test messages for existence of required data items
- Map HL7 data elements to North American Association of Central Cancer Registries (NAACCR) data elements
What is CONNECT?
Background

- CONNECT is an open source software
- It is the outcome of a 2008 decision by federal agencies to begin work on connecting their health IT systems into the NHIN
- The federal agencies collaborated through the Federal Health Architecture program to create a single solution that can be reused by each agency within its own environment
Purpose

- To provide a secure, nationwide, interoperable health information infrastructure that will connect providers, consumers, and others involved in supporting health and healthcare
Goals

- To develop capabilities for standards-based, secure data exchange nationwide
- Improve the coordination of care information among hospitals, laboratories, physicians offices, pharmacies, and other providers
- To ensure that appropriate information is available at the time and place of care
- To ensure that consumers’ health information is secure and confidential
- Give consumers new capabilities for managing and controlling their personal health records as well as providing access to their health information from electronic health records (EHRs) and other sources
- Reduce risks from medical errors and supporting the delivery of appropriate, evidence-based medical care
- Lower healthcare costs resulting from inefficiencies, medical errors, and incomplete patient information
All goals are satisfied by using CONNECT!
Technical Architecture
Highlights of CONNECT

- Based on service-oriented architecture design principles and web services
- Individual components can be customized according to the organization’s requirements
- Allows implementation to be hosted on different hardware and software platforms
Technical Details

- Platform independent; tested on Windows XP, Solaris, Linux
- Uses EJBs (integrated development environment)
- GlassFish Enterprise Server 2.1 (Application Server)
- Open Enterprise Server Bus (ESB)
- MySQL Community 5.1 (RDBMS)
Main Components

- Gateway (most likely non-customizable)
- Adapter Layer which includes:
  - Enterprise Service Component (ESC)
  - Universal Client Framework
Gateway

- Implements the core NHIN services
- Has its own core web services and components
- Locates patients at other Health Organizations within the NHIN
- Requests and receives documents associated with the patients
- Records transactions for subsequent auditing by patients and others
- Authenticates network participants
- Formulates and evaluates authorizations for the release of medical information
Adapter Layer

- Is most likely the customizable part to meet the requirements of an organization's existing systems.
- Consists of Enterprise Service Component (ESC) and the Universal Client Framework.
- ESCs provide robust tools for indexing patient identities, maintaining patient health documents, implementing business rules for authorizing the release of medical information and more.
- Universal Client is a client framework for developers to implement enterprise service components.
CONNECT Federal Gateway Overview

NHIN

Data (e.g. CCD conformant to HITSP C.32)

Other NHIN Participant
- HIEs
- Federal
- States
- Local

- IDNs
- Data Banks
- PHRs etc...

NHIN Core Services

AGENCY

Agency-Specific Adapter

Existing Agency Health IT System(s)

Adapter Software Development Kit
Benefits of using CONNECT

- **Public health focused benefits** -
  - Early detection of and rapid response to infectious disease outbreaks around the country
  - Improved tracking of chronic disease management – promotes prevention
  - Evaluation of healthcare based on value enabled by the collection of de-identified price and quality information that can be compared
  - Facilitates health and clinical research and healthcare quality
Benefits of using CONNECT

- **Patient focused benefits** –
  - Improves the coordination of care and information amongst hospitals, laboratories, physician offices and other entities through an effective infrastructure for the secure and authorized exchange of healthcare information
  - Reduces healthcare costs
  - Expand access to affordable care
  - Increase administrative efficiencies and decreases paperwork

- **Promotes a more effective marketplace** -
  - Greater competition
  - Greater systems analysis
  - Increased consumer choice
  - Improved outcomes in healthcare services and efforts to reduce health disparities
### Comparison of CONNECT with PHINMS

<table>
<thead>
<tr>
<th>Area</th>
<th>CONNECT</th>
<th>PHINMS</th>
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<tbody>
<tr>
<td><strong>Goal</strong></td>
<td>To enable exchange of patient identifiable and non patient specific records securely using the Internet</td>
<td>To enable transmittal of secure and reliable messages over the Internet</td>
</tr>
<tr>
<td><strong>Platform</strong></td>
<td>Platform independent</td>
<td>Platform independent</td>
</tr>
<tr>
<td><strong>Technologies used</strong></td>
<td>Uses Java EJBs (integrated development environment), GlassFish Enterprise Server 2.1 (Application Server), Open ESB(Enterprise Service Bus), MySQL Community 5.1 (RDBMS), Tested on Windows XP, Solaris, Linux</td>
<td>Relies on Electronic Business Extensible Markup Language (ebXML), Extensible Markup Language (XML) Extensible Markup Language Encryption (XMLENCC), Extensible Markup Language Digital Signature (XMLDSIG), Simple Object Access Protocol (SOAP) among the main ones; implemented using Java and Java 2 Platform, Enterprise Edition (J2EE) standards</td>
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<tr>
<td><strong>Security</strong></td>
<td>Uses an XML based framework for communicating user authentication, entitlement and attribute information.</td>
<td>Supports automated authentication dialogs for client certificate-based authentication over SSL, basic authentication and form based authentication.</td>
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CDC and CONNECT
CDC’s Progress

- CDC has a live CONNECT Gateway setup
- NPCR-AERRO demonstrated its ability to utilize the CONNECT Gateway at the HIMSS 2010 conference
Improving Public Health Cancer Registry Reporting
Centers for Disease Control and Prevention

Diagram:
- State Cancer Registry System → State NHIN Gateway Adapter* → Adapter SDK → State Health Department NHIN Gateway
- CDC NPCR Existing HIT System → CDC NHIN Gateway Adapter* → Adapter SDK → CDC NHIN Gateway
- NHIN
Conclusion

- PHGrid and CONNECT Software are very comprehensive
- PHGrid and CONNECT provide a way to integrate and securely share data across the healthcare community
- More evaluation and testing of both PHGrid and CONNECT is needed
- Need to test the use of PHINMS with the CONNECT Software
Thank you!
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