Session C2 - Improving Program Readiness for Automated Data Exchange

Engaging Public Health Informatics in the Development of an Interoperability Hub Solution

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Agenda

- What is the PHIX project
- Developing a Standards Based Solution
- Current Use Cases Supported by PHIX
- Emerging Plans for PHIX
- Questions

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What is PHIX project?

ARRA PHLISSA Project Background

- **HITEC Section 3011 of the PHSA was amended by ARRA (recovery act) to include** *improvements and expansion of use of Health IT by public health departments*
- **HITEC Public Health Spend Plan includes 2 components:**
  - Interoperability of Immunization Registries and Electronic Health Records
  - Electronic Laboratory Reporting between Public Health and Clinical Care
    - Infrastructure and Interoperability Support for Hospital and Public Health Laboratories
    - Laboratory Interoperability Solutions and Enterprise Architecture Coordination (***PHLISSA***)
    - Laboratory Technical Implementation Assistance for Public Health
- **Meaningful Use Matrix Priorities:**
  - Improve population and public health
  - Improve quality, safety, efficiency, and reducing health disparities
  - Engage patients and families in their healthcare
  - Improve care coordination

PHLISSA Project Mission

- **Public Health Information eXchange (PHIX) is an interoperable public health solution being developed for demonstration and production pilot purposes**
  - ✓ **EHR meaningful use, ELR, Immunization & Syndromic Surveillance**

- Standards-based architecture and platform to support full interoperability among public and clinical health labs and healthcare providers
- PHLISSA ETOR (Electronic Test Order and Result) will be limited use production pilot involving PH labs and CDC OID Salmonella lab

PHIX Intended Goals

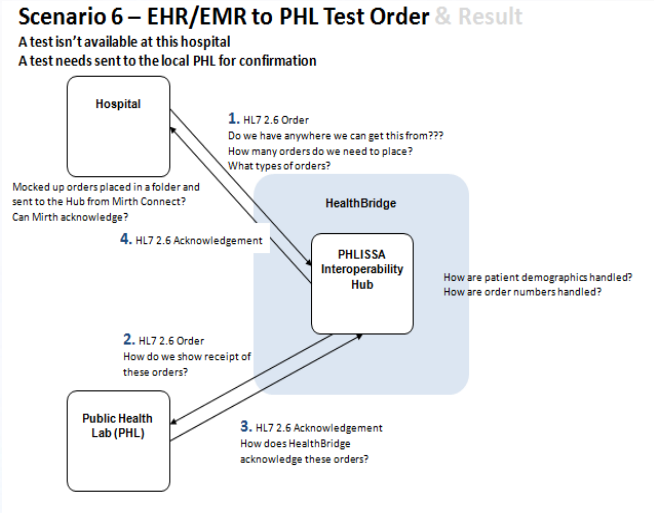
- Maximize prevention using Health Information Exchanges and Health Information Technology
- Increase Informatics capability of public health agencies
- Create opportunities for leveraging the project
  - Develop the Core Hub using Open Architecture components
  - Consider reuse of existing CDC Components where available
- Support ARRA Meaningful Use
- Foster and share new knowledge in public health informatics
  - Evaluate “best” technologies and practices for common HIE services
  - Participate in PHI and public health conferences and demonstrations and publish PHIX documents

Project Highlights - PHIX

- 19 month contract awarded to SAIC and managed by OSELS (July 2011 – Feb 2012)
- Primary stakeholders include CDC OSELS, OID, APHL and HealthBridge
- Notable Activities
  - ✓ Project kick-off: July 21st, 2010
  - ✓ Scope Developed: Oct. 14th, 2010
  - ✓ Technical Presentation: June 22nd, 2011
  - ✓ Deployed PHIX to CDC Portal: Aug. 29th, 2011
  - ✓ Launch Hub in PHITPO OS Lab: Oct. 2011
  - ✓ Deploy PHIX at HealthBridge: Nov. 2011

HealthBridge HIE Participation

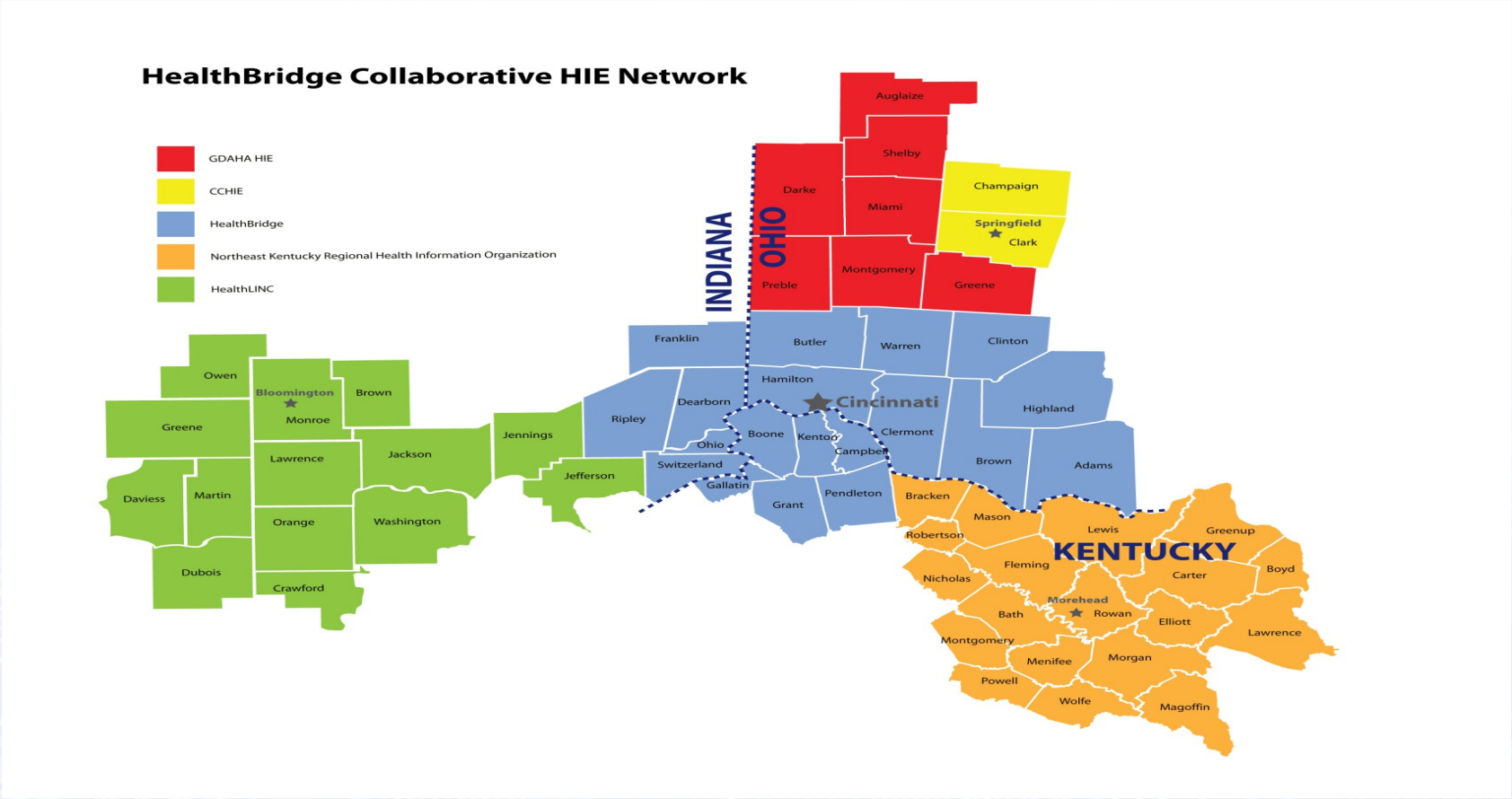
- Use Case Development and Review
- Solution Architecture and Design Review
- Demonstration Scenarios
- Demonstration Message Development



Background - HealthBridge™

- One of the nation's largest and most successful community health information exchanges
- In operation since 1997
- 501c3 Not for Profit
- Successful HIE/RHIOs with cash-positive, sustainable business model
  - (Pre ARRA) 97% of revenue from fees; <3% grants
  - 5-12% annual return for last eight years
  - Deliver more than 3 million clinical messages per month
  - EMR Feeds to 27 different vendors, 60+ versions

HealthBridge – Coverage Area



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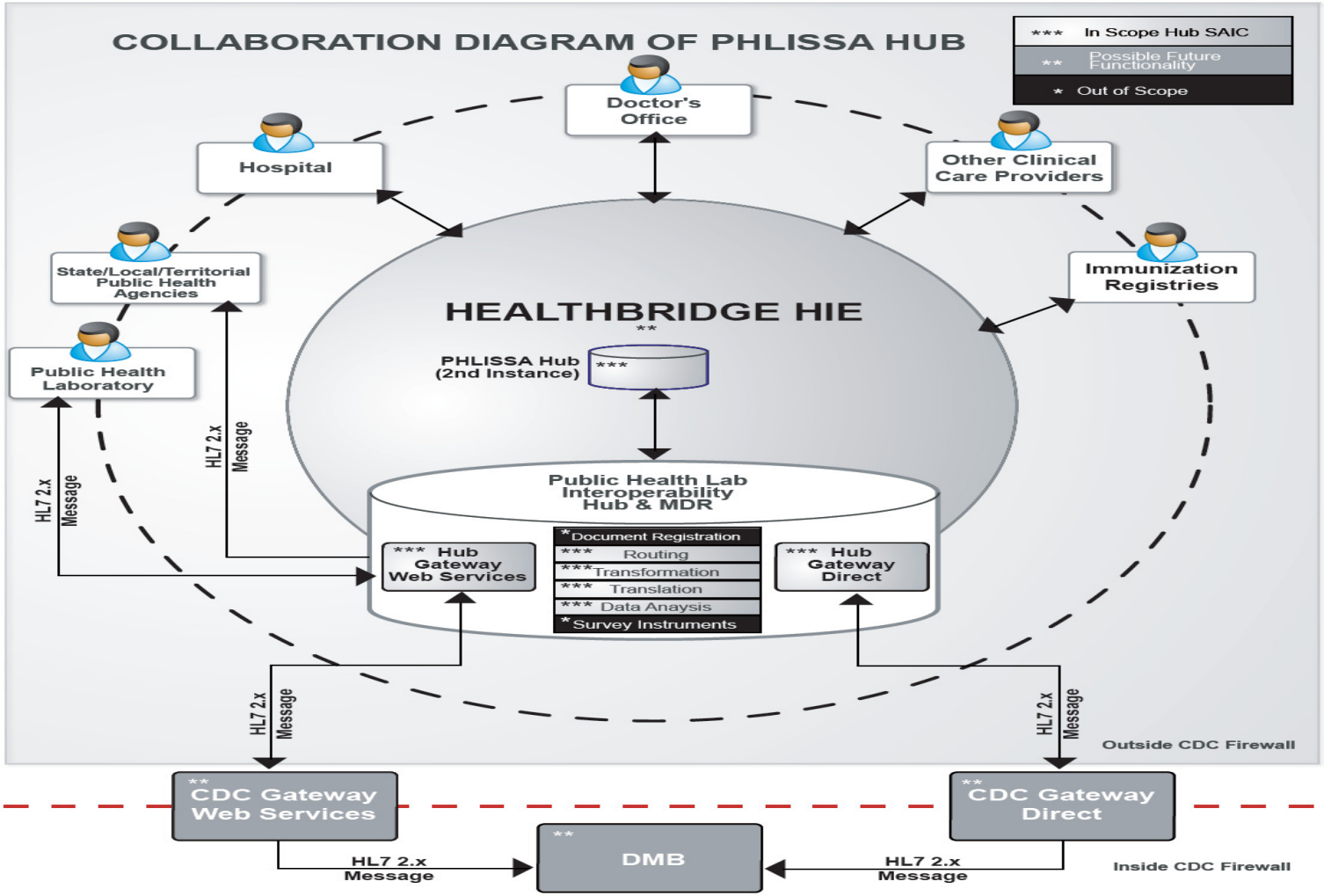
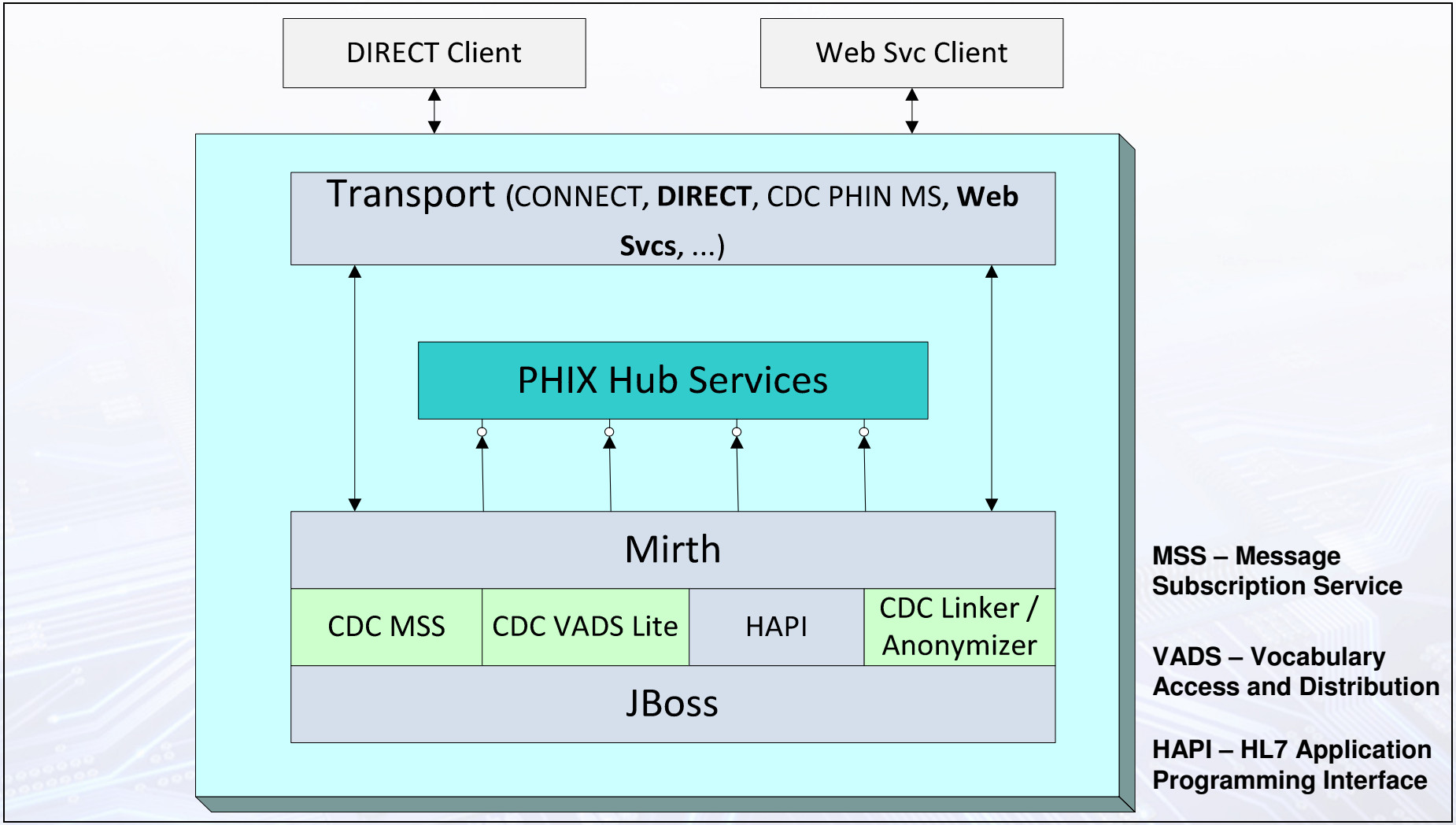
Developing a Standards Based Solution

Collaboration Diagram – PHIX



PHIX Architecture Overview



PHIX Components

Information Exchange – Mirth integration engine consuming a collection of discrete internal web services to validate, transform, translate, and produce notifications for HL7 messages.
Anonymizer/Linker- Stores patient identifiable data in a secure database, generates a key required for later re-identification and retrieval, and erases patient identifiable data from outgoing messages. Solution includes a secure web portal for later re-identification. Source: BioSense, with Mirth custom configuration and PostgreSQL database port by PHIX team.
Code Translation Service – Augments localized vocabulary with standardized vocabulary (e.g., LOINC, SNOMED, CVX). Source: MSS (Apache Derby database port).
Code Validation Service- Uses VADS Lite version of PHINVADS to determine validity of fields containing standardized vocabulary (e.g., LOINC, SNOMED, CVX). Source: MSS (Apache Derby database port), VADS Lite (Apache Derby port).
Component Routing Service - Determines routing and which components will be called based on message type, trigger event, HL7 version, and sending and receiving organizations. Configuration information stored in the information exchange PostgreSQL database, but accessed by Mirth via web service calls during runtime message processing. Transport-agnostic component that was custom developed for PHIX.

PHIX Components (cont.)

Email notification- Utilizes Mirth to send automated responses to preconfigured recipients when notifiable conditions are detected. PHIX custom configuration.
Runtime Translation – Mirth based field-to-field copying and segment additions based on differences between source and destination message versions. PHIX custom configuration.
Subscription Service- Evaluates specified files containing numeric, textual, or coded results for conditions that are considered "notifiable" and therefore require public health notification. Source: MSS (Apache Derby database port).
Structural Validation Service- Uses HAPI to determine structural validity based on an HL7 message and a constrained conformance profile. PHIX custom component.

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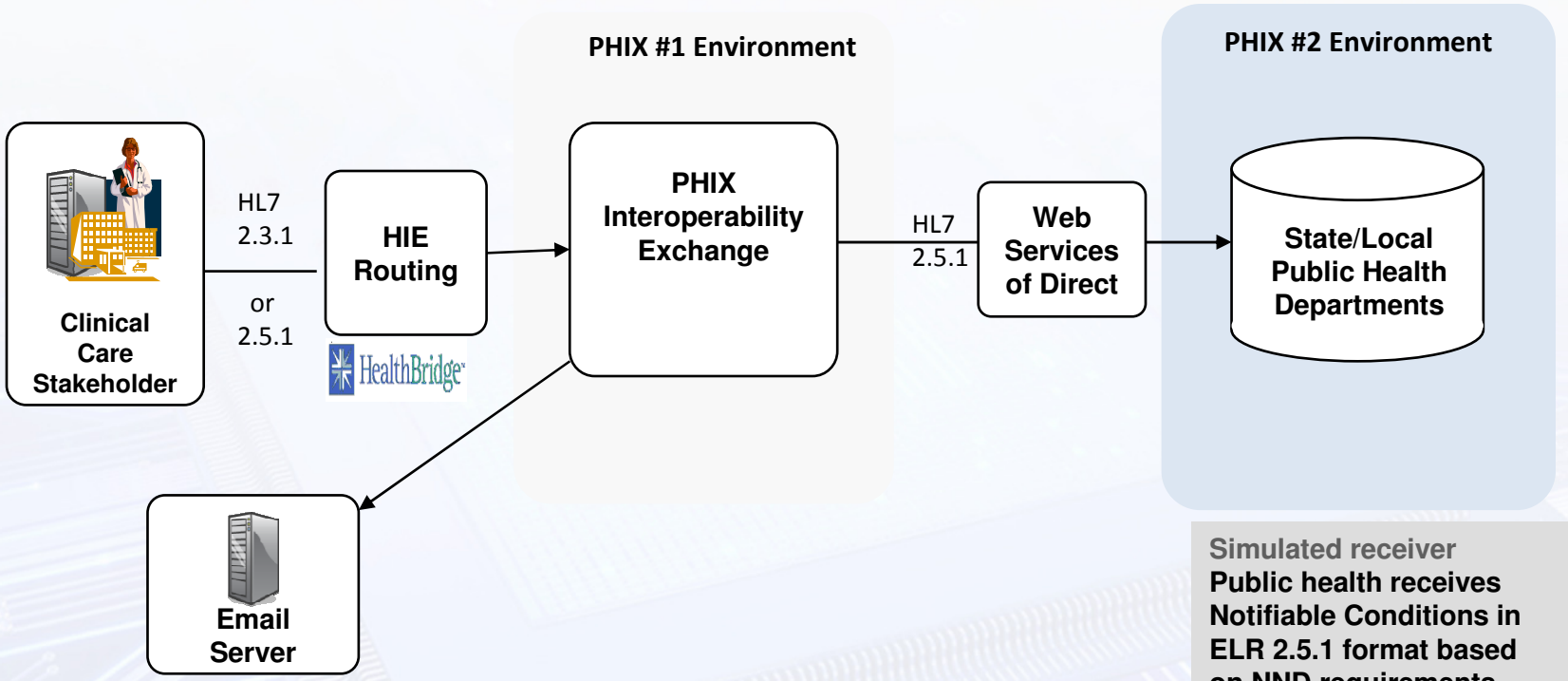
Current Use Cases Supported by the PHIX

Scenario 1 – Report Notifiable Laboratory Results

Notifiable Results Reporting

- Define 3 Disease Conditions for demonstration purposes
  1) Hepatitis C; 2) Influenza (H1N1); 3) Salmonellosis
- Transform v2.3.1 messages to ELR 2.5.1 format and create SPM and SFT segments
- NND triggers based on LOINC Codes and various result data



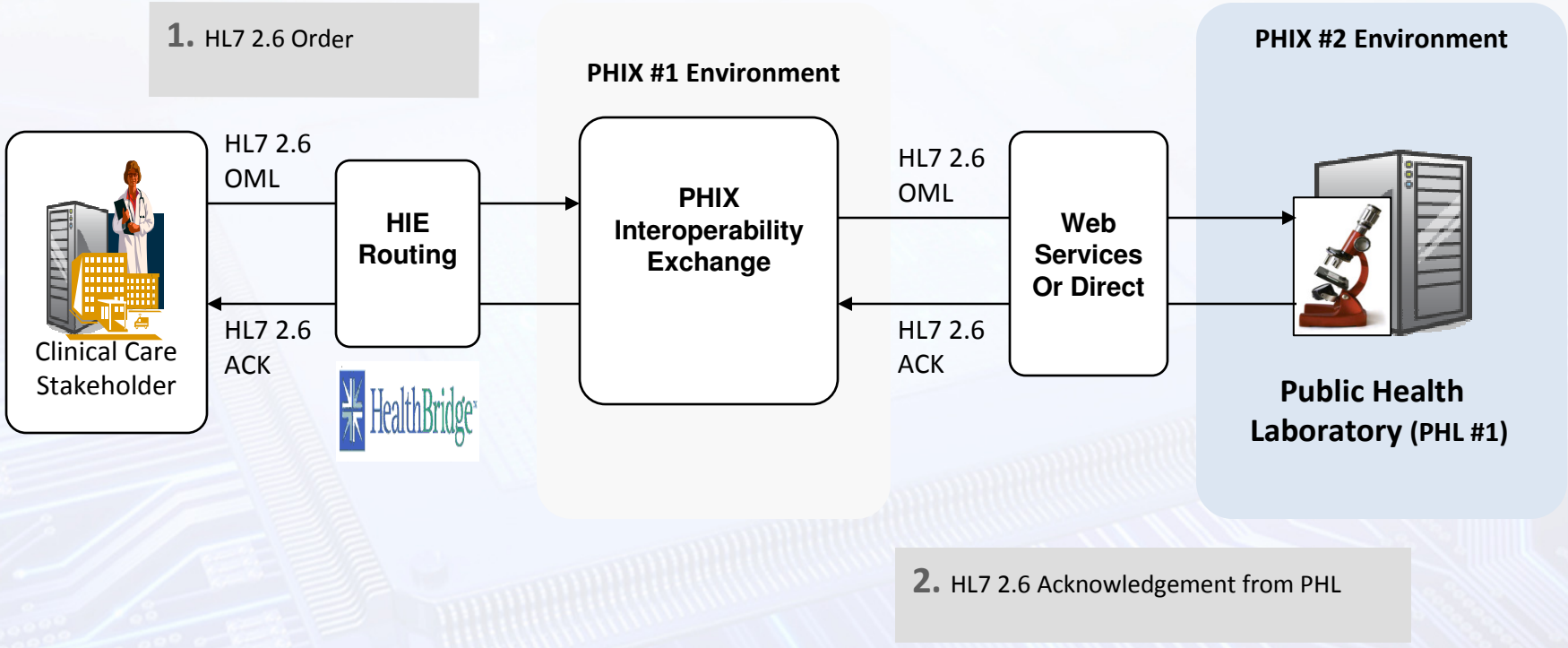
Simulated receiver
Public health receives Notifiable Conditions in ELR 2.5.1 format based on NND requirements

Case Rpt Notification
Exchange provides an email notification indicating that a Notifiable Disease Condition has been detected to serve as a prompt to initiate Case Reporting procedures.

Scenario 2 (parts 1 & 2) – EHR/EMR to PHL Test Order & Results

PHL Test Order/ACK

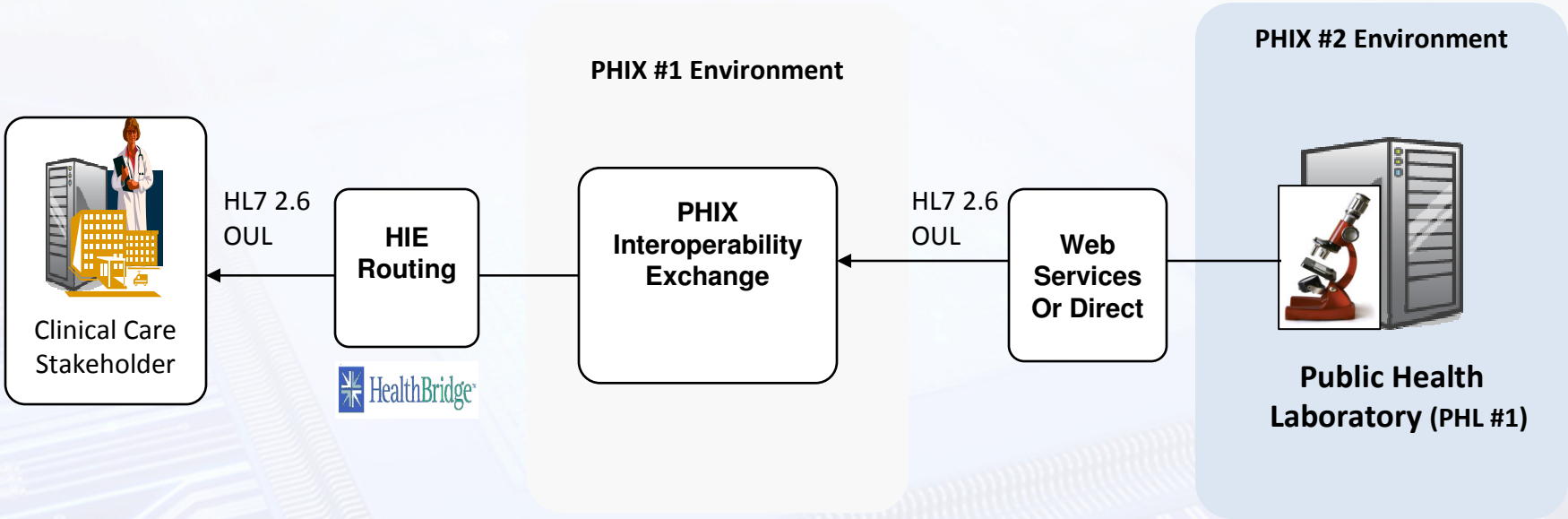
- **Send HL7 2.6 OML message to PHL for identification/confirmation of Salmonella organism**
- **Patient demographics are provided in PID, PV1 and PV2 segments**
- **MSH Control Id field used to identify ACK message**
- **PHL provides order Acknowledgement (ACK) to clinical care stakeholder**
- **Used for validation of initial identification or confirmation of disease condition**



Scenario 2 (part 3) – EHR/EMR to PHL Test Order & Result

PHL Test Result

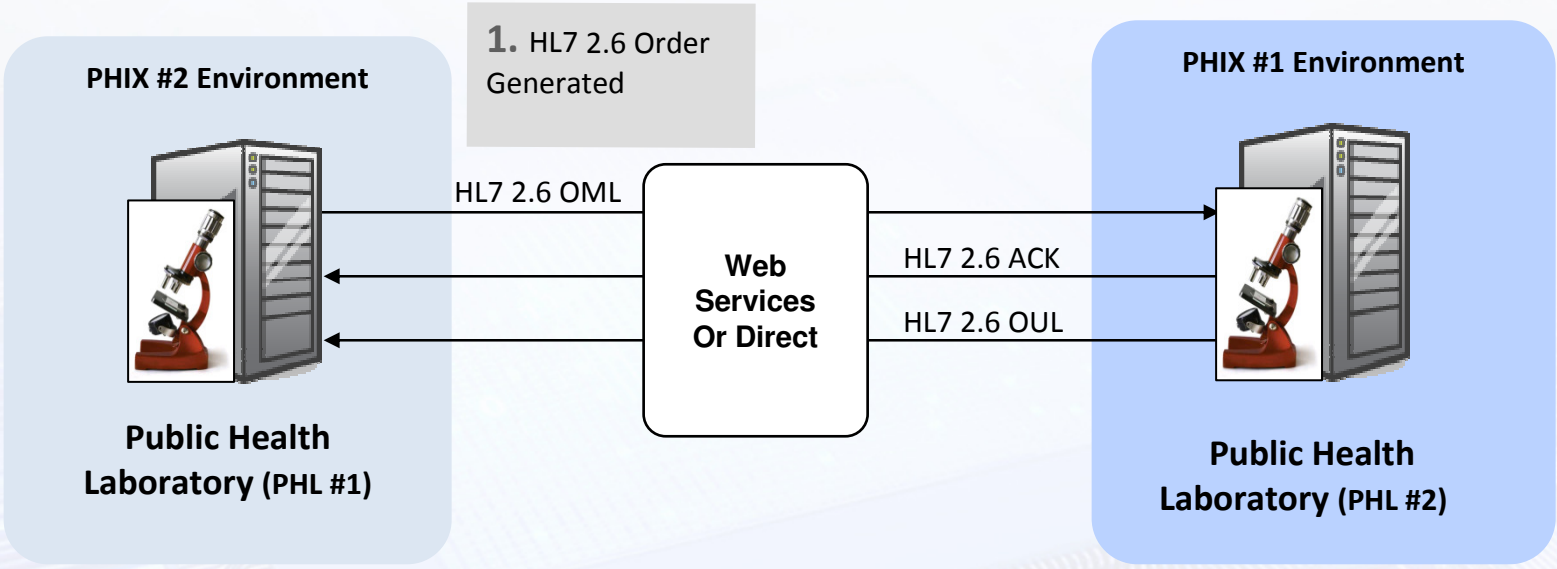
- **HL7 2.6 result. Hub facilitates routing results to HIE/Clinical Care Stakeholder**



3. HL7 2.6 Result
Results based on orders from prior slides.

Scenario 3 – PHL to PHL Test Order & Result

- Send HL7 2.6 OML message to PHL for identification/confirmation of Salmonella organism
- Patient demographics are provided in PID, PV1 and PV2 segments
- MSH Control ID used to identify ACK message
- PHL provides order Acknowledgement (ACK) to ordering PHL
- Used in the event of workload capacity overflow and testing availability

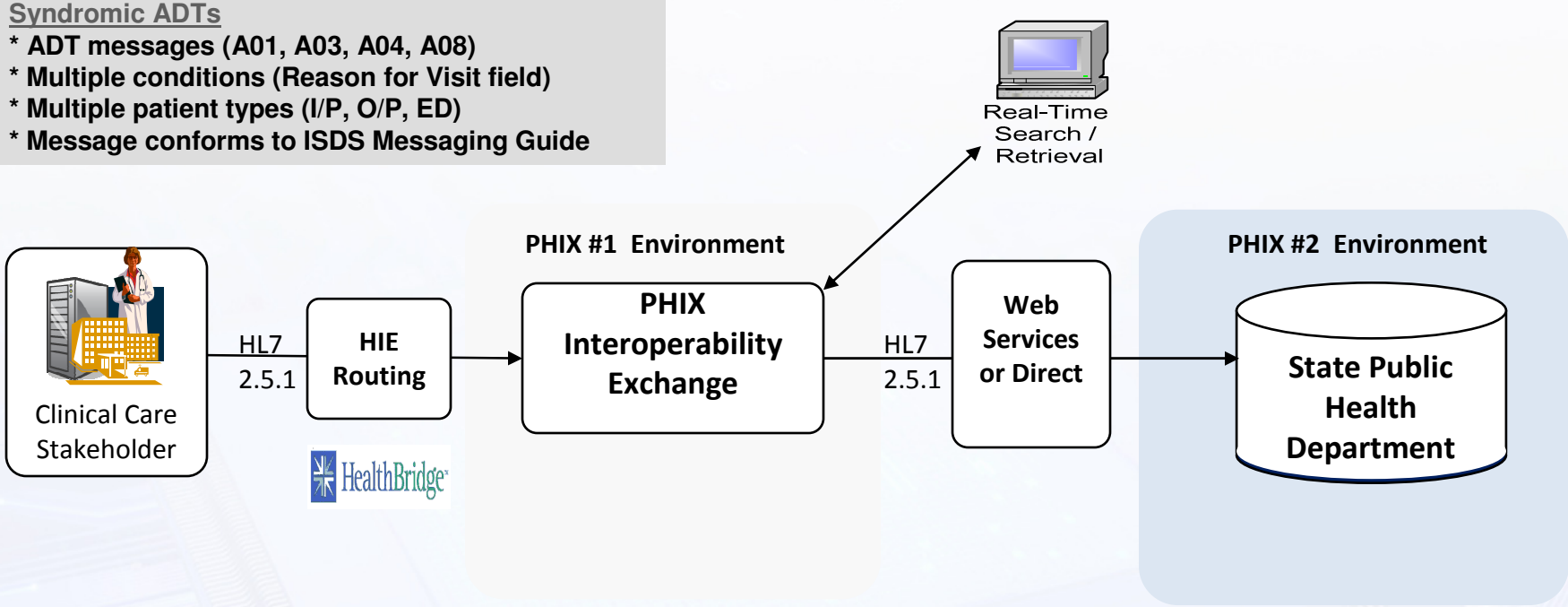


2. HL7 2.6 Acknowledgement from PHL

3. HL7 2.6 Result from PHL, based on prior orders received by PHL#1

Scenario 4 – Send Unsolicited ADT Messages (Syndromic Surveillance)

Syndromic ADTs
* ADT messages (A01, A03, A04, A08)
* Multiple conditions (Reason for Visit field)
* Multiple patient types (I/P, O/P, ED)
* Message conforms to ISDS Messaging Guide

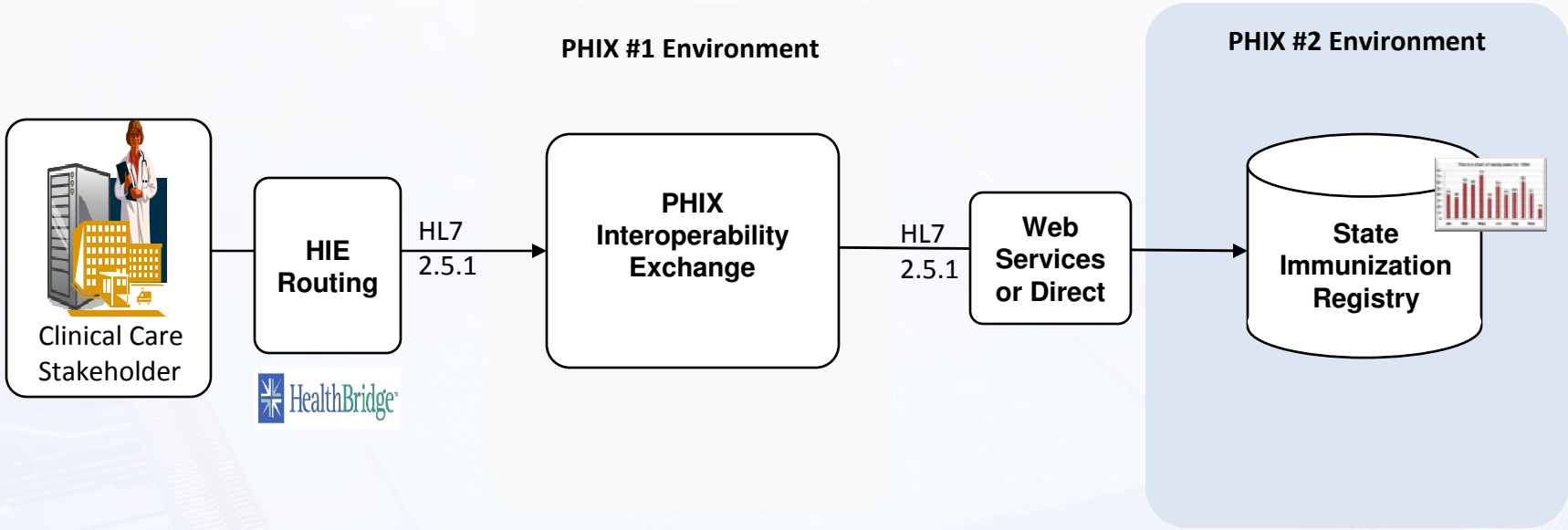


- Exchange sends all results to State Public health as anonymized data.
- Ideally HIE would provide filtering if required.
- Patient re-identification functionality (public health emergency) supported

* Simulated receiver
- 2nd PHIX instance provides receiver support.
- PH departments define natural language processing rules to put data in correct syndromic category

Scenario 5 – Send Unsolicited Vaccination Messages

Unsolicited Vaccinations
* **HL7 VXU 2.5.1 messages**
* **3 – 4 different vaccines across the messages with code validation**



- **Messages provided by Clinical Care Stakeholder and retrieved by the exchange.**
- **Inpatient, Outpatient and ED patient data from hospital**
- **Unsolicited messages only. No queries.**

- **Provides Secure web services or Direct out of PHIX**
- **Supports emerging immunization specification HL7 2.5.1**

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Emerging Plans for the PHIX

Next Steps for Open Source PHIX Portal

- Aug 2011: PHIX has been installed in the CDC IR&D Laboratory to produce a robust product with sample messages
- Oct 2011: PHIX Open Source Community Portal will be launched in PHITPO Open Source Laboratory to provide sound tooling and support community access
- Oct 2011: Complete product hardening activities and enhancements for PHIX in Portal
- Nov 2011: Deploy PHIX at HealthBridge in a pilot production effort with state/local public health departments in Ohio

To learn more about the PHIX…

- Contact
  - Gautam Kesarinath gfk0@cdc.gov
  - Mike Trebatoski trebatoskim@saic.com
- Go to http://phlissa-hub.phiresearchlab.org/ to access the PHIX Hub Open Community Portal and view additional information
- Go to http://code.phiresearchlab.org/ to visit the CDC Informatics Research & Development Portal
- Attend PHIX demonstrations at the SAIC booth

Questions