A Shared Service Architecture for Immunization Information System Data Exchange

CDC Health Data Innovation Summit

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Background: Immunization Information Systems (IIS)

- Confidential, population-based systems
- Collect and consolidate immunization data in a given jurisdiction
- Provide actionable information for clinical and public health decision making. (Source: CDC)

IIS Background (continued)

- Although IIS are made up of a mix of different software systems and architectures, they all support standards-based messaging via HL7.
- Inbound data exchange:
  - HL7 version 2 Unsolicited Vaccination Update (VXU)
  - Flat file
  - Interactive web applications
- Outbound data exchange:
  - HL7 version 2 Query/Response (QBP/RSP)
  - Flat file (CDC Data Clearinghouse, HEDIS data, etc.)
  - Interactive web applications

Background: Immunization Gateway (IZ Gateway)

- Centralized data exchange hub
- IIS connect to the hub to exchange HL7 messages with each other and with federal partners
- Leverages the same message and transport standards as point-to-point IIS messaging
- Provides authentication, routing, and onboarding services

What's new from the IIS Perspective?

- Connecting to a broker
- Certification authentication
- Outbound VXU and QBP
- National identifiers and destination IDs
- Need to prevent loops
- Mapping IIS-to-IIS differences
- Testing and auditing requirements

Implementation Options for the IIS

- Traditional Approach:
  - Develop custom outbound VXU and QBP functionality
  - Modify existing HL7 service
  - Implement loop prevention
- Shared Service Layer Approach:
  - Shared service provides inbound and outbound functionality and loop prevention
  - Layer in front of existing HL7 service to intercept inbound messages and modify them to be accepted by existing service

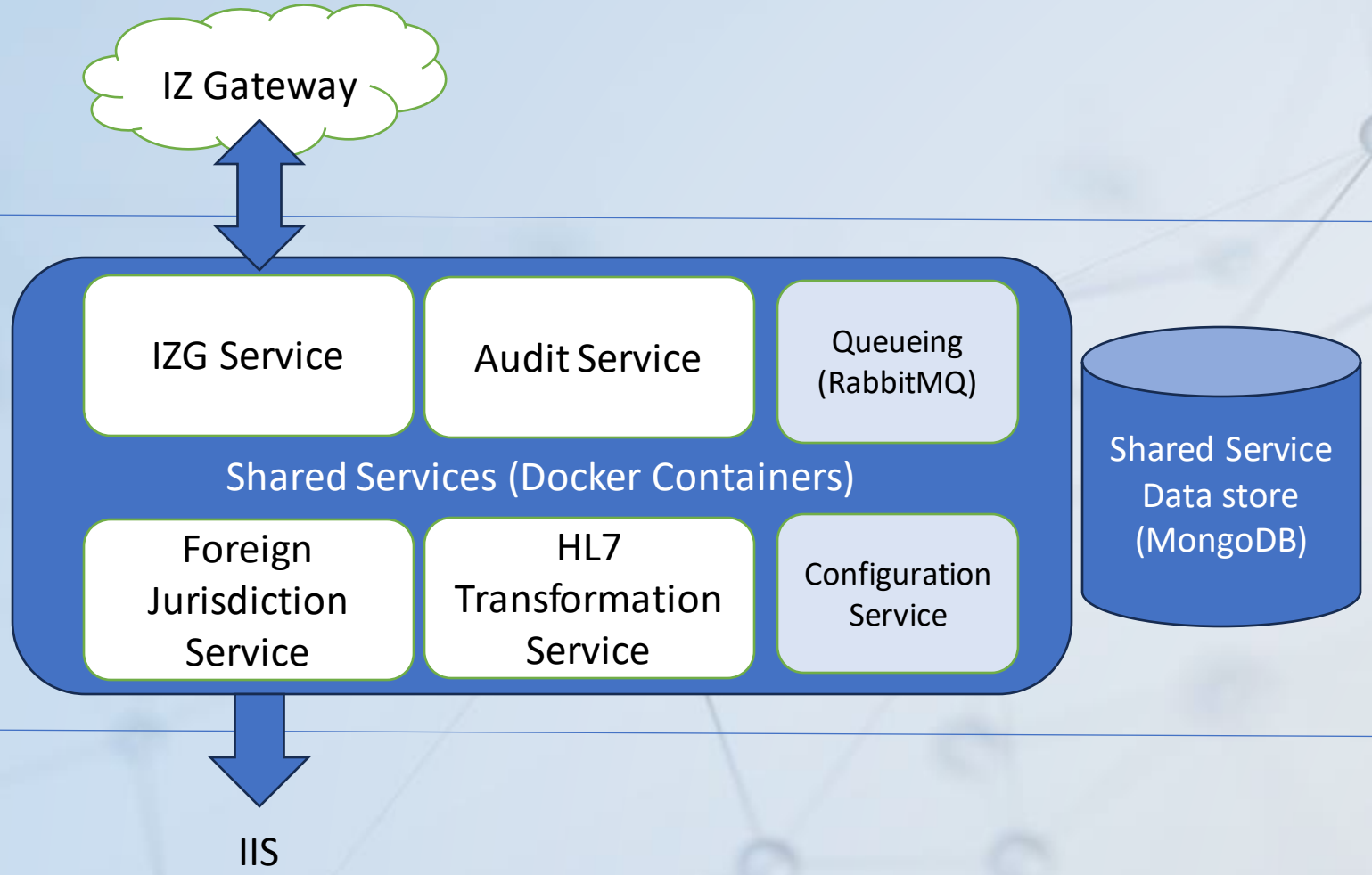
Shared Service Layer Approach

- Layer in front of existing inbound HL7 service:
  - Receive & authenticate messages from IZ Gateway
  - Transform and pass to HL7 service as if from any other partner
- Generates outbound messages
- Audit logging
- Message queueing
- Loop prevention

Shared Service Layer Approach (continued)

- Jointly developed by NYC CIR and RI RICAIR
- Service runs in Docker containers
- Requires no changes to the IIS itself
- Components:
  - IZG Service
  - HL7 Transformation Service
  - Audit Service
  - Foreign Jurisdiction Service
- Uses MongoDB as a data store and RabbitMQ for queueing

Shared Service Layer Architecture



Results

- Service Layer go-live in both jurisdictions mid-2022
- Exchanged hundreds of thousands of messages between NYC and RI, and with the CT, NJ, Philadelphia IISs, and VHA.
- Same software in NYC and RI
  - Automated cloud-based container deployment workflow
  - Enhancements developed for NYC automatically benefit RI, and vice versa.
- Streamlined onboarding process

Thank you!

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  - HLN Rhode Island and NYC teams

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