



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

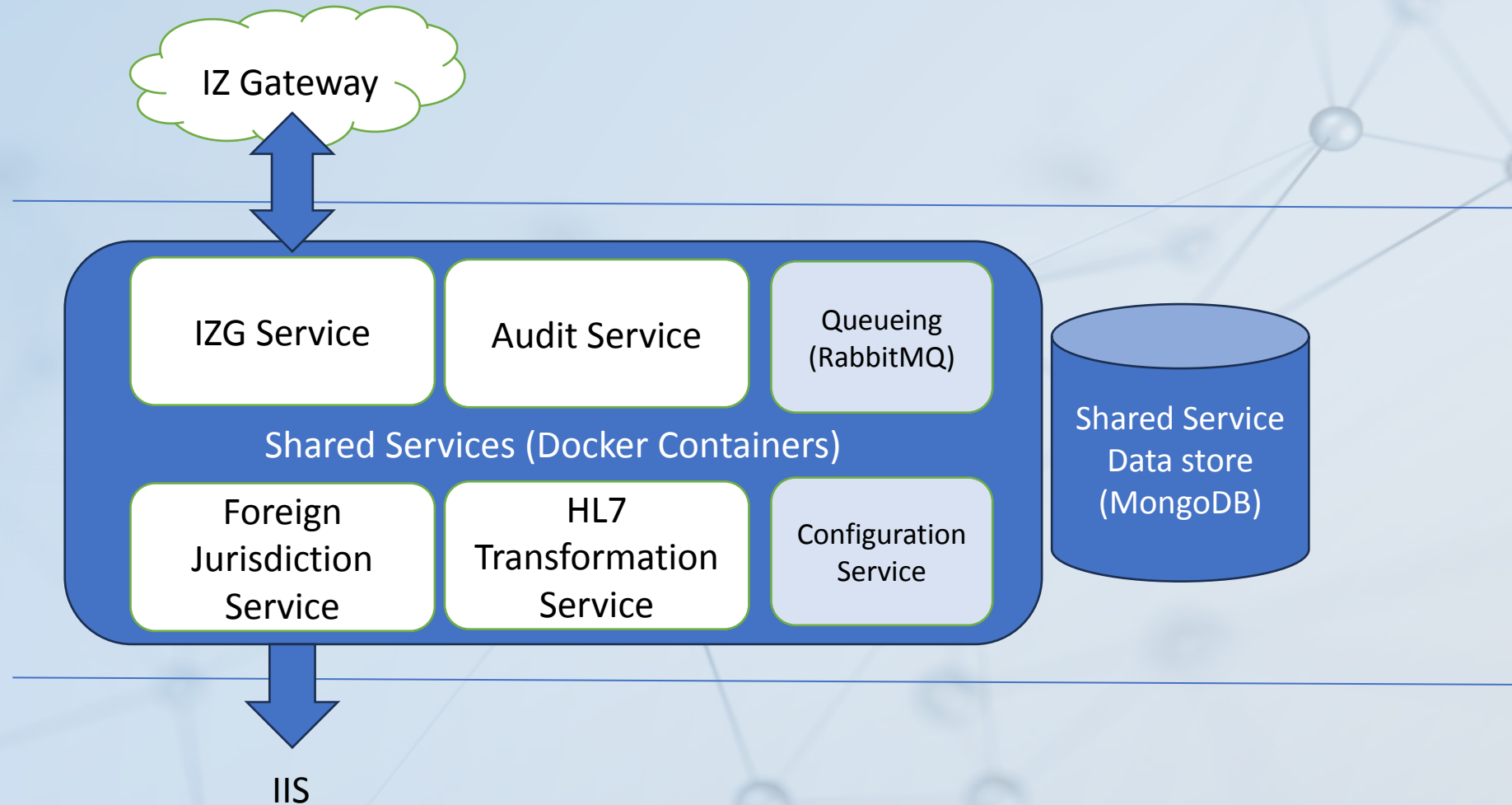
Shared Service Layer Approach

- 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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