

New Jersey Architecture

Version 4

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1. Introduction

The following document describes the architecture that MiHIN is standing up for the New Jersey Health Information Network (NJHIN). This document is intended as a living document to describe the high level architecture of the various subsystems, their interactions, and the machines associated with those subsystems.

The following major systems are part of this document:

1. TOC Service – Used for ADT transmission
2. Rhapsody – used for VXU Query, and VXU Submission
3. ACRS Service – Used by the TOC service for querying active care relationships
4. Health Directory/Informatica – Used to manage delivery preferences.
5. Common Key Service – Used to create, query, and assign common keys
6. MiDIGATE – Used to accept DIRECT secure messaging, detach HL7v2 attachments, and send those HL7v2 messages to Rhapsody (VXU Submission), or the TOC service (ADT).

For more details on each subsystem, see the corresponding design documentation for each service.

2. Transitions of Care Service

Transitions of Care (TOC) Notification Service receives HL7 Admission-Discharge-Transfer (ADT) and other similar messages from hospitals, urgent care, and other senders and delivers those messages to the patients care team.

TOC service is made up of several reusable technologies, components, and services deployed on the Mule Enterprise Service Bus (ESB) platform.

Figure 1 depicts the high-level architecture for TOC and how it interacts with external systems.

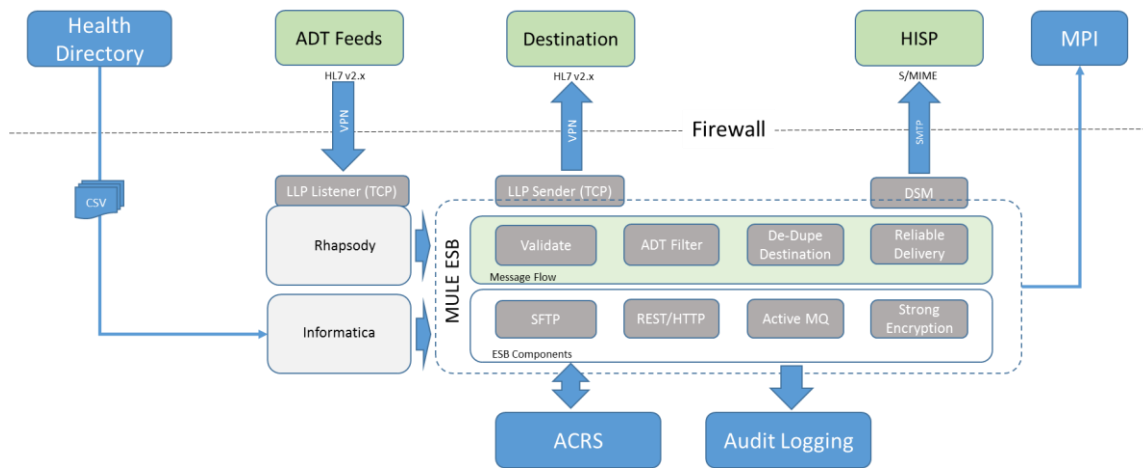


Figure 1. TOC Service

Production Machines:

Machine Name	Machine IP	Machine Purpose
NJHN-BSCY-NJ-TOCMULE-FIP-01		Transition of Care Service
NJHN-BSCY-NJ-TOCINF-FIP-01		Informatica Server
NJHN-BSCY-NJ-TOCSQL-FIP-01		Audit Logging Server
NJHN-BSCY-NJ-TOCACRS-FIP-01		Active Care Relationship Service
HPD		Delivery Preferences
NJHN-BSCY-NJ-RHAP-FIP-01		Filtering/Normalizing inbound ADT for sending to TOC service

Pre-Production Machines:

Machine Name	Machine IP	Machine Purpose
NJHN-BSCY-NJ-TOCMULE-FOC-01		Transition of Care Service
NJHN-BSCY-NJ-TOCINF-FOC-01		Informatica Server
NJHN-BSCY-NJ-TOCSQL-FOC-01		Audit Logging Server
NJHN-BSCY-NJ-TOCACRS-FOC-01		Active Care Relationship Service
HPD		Delivery Preferences
NJHN-BSCY-NJ-RHAP-FOC-01		Filtering/Normalizing inbound ADT for sending to TOC service

3. Rhapsody

The Rhapsody server is a commercial solution that is used for the routing and transformation of VXU submission, VXU query, and receives ADT feeds for normalization and conformance reporting before sending to the TOC service.

Queuing, Replaying and Alerts:

Queuing messages are used in a situation where a message is sent to a destination and no ACK is received back from destination system. Rhapsody will automatically queue the undelivered messages and will continue to retry sending the messages every 5 minutes for 24 hours. After 24 hours an alert is generated notifying stakeholders that the receiving system is unresponsive.

Replaying messages are used in a situation where it may be required to initiate a replay of messages based on a date range or other criteria. The current NJ Rhapsody message store is set to 30 days. The Rhapsody archive can be searched and messages replayed directly using the web management console.

Alerts are generated if an inbound connection is idle for more than one hour. The idle time can be adjusted as required. As soon as the receiving connection has been reestablished and messages are being received the alert state is cleared.

Production Machines:

Machine Name	Machine IP	Machine Purpose
NJHN-BSCY-NJ-TOCMULE-FIP-01		Receives ADT from MiHIN Rhapsody
NJHN-BSCY-NJ-MIDI-FIP-01		Delivers native HL7v2 VXU and HL7v2 ADT to Rhapsody over LLP that are sent as DIRECT Attachments.
NJ DOH Data Hub		Receives VXU, QBP originating from HIO's through MiHIN Rhapsody.
NJHN-BSCY-NJ-RHAP-FIP-01		Receives VXU, QBP, ADT from HIE

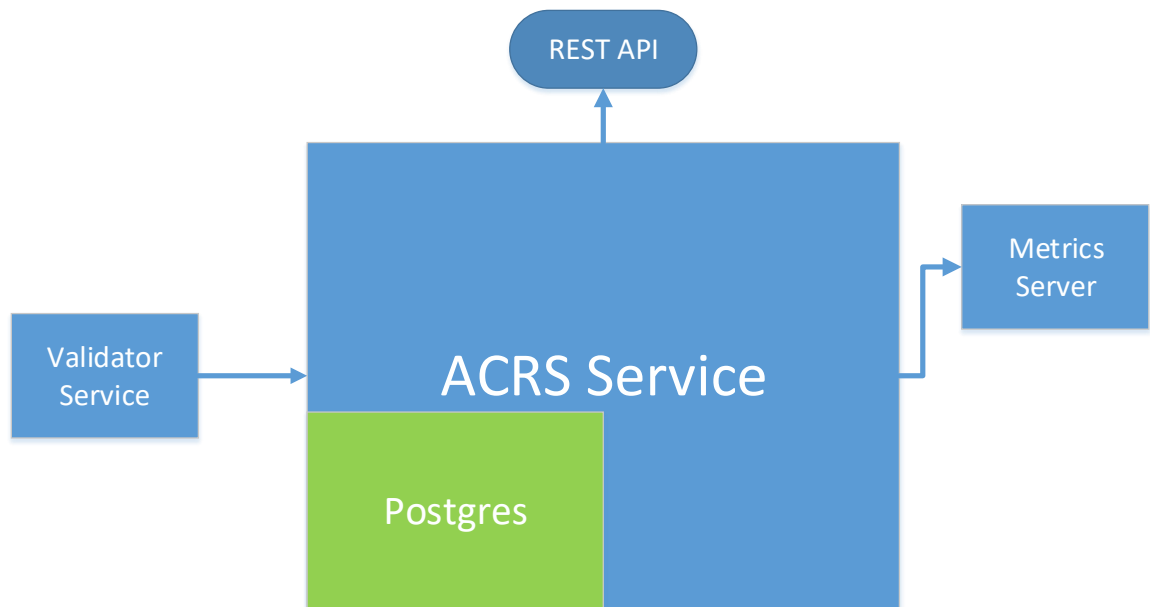
Pre-Production Machines:

Machine Name	Machine IP	Machine Purpose
NJHN-BSCY-NJ-TOCMULE-FOC-01		Receives ADT from MiHIN Rhapsody
NJHN-BSCY-NJ-MIDI-FOC-01		Delivers native HL7v2 VXU and HL7v2 ADT to Rhapsody over LLP that are sent as DIRECT Attachments.

NJ DOH Data Hub		Receives VXU, QBP originating from HIO's through MiHIN Rhapsody.
NJHN-BSCY-NJ-RHAP-FOC-01		Receives VXU, QBP, ADT from HIE

4. ACRS Service

The MiHIN Active Care Relationship Service (ACRS) is a high speed service that can be queried via a REST API for a patients care team given a set of patient demographics. The TOC service calls this service to determine the care team for patient discharge. The service is a Java application, with a Postgres database backend. The architecture is below.



Production Machines:

Machine Name	Machine IP	Machine Purpose
NJHN-BSCY-NJ-TOCACRS-FIP-01		The FIP Server
NJHN-BSCY-NJ-METRICS-FIP-01		The Metrics server that is used for logging of real time metrics for operational monitoring
NJHN-BSCY-NJ-VALIDATOR-FIP-01		Where received ACRS files are validated prior to loading into the ACRS service.

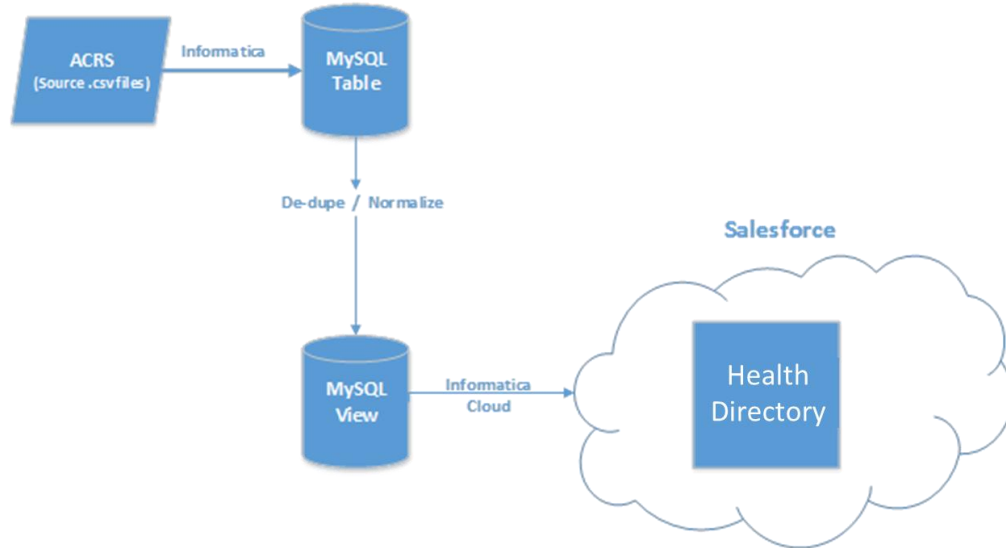
Pre-Production Machines:

Machine Name	Machine IP	Machine Purpose
NJHN-BSCY-NJ-TOCACRS-FOC-01		The FIP Server

NJHN-BSCY-NJ-METRICS-FOC-01		The Metrics server that is used for logging of real time metrics for operational monitoring
NJHN-BSCY-NJ-VALIDATOR-FOC-01		Where received ACRS files are validated prior to loading into the ACRS service.

5. Health Directory and Informatica

Health Directory is located in Salesforce. It manages all delivery preferences for providers in TOC. These delivery preferences are downloaded from Salesforce using the Informatica server.



Production Machines:

Machine Name	Machine IP	Machine Purpose
NJHN-BSCY-NJ-TOCINF-FIP-01		Informatica server to load ACRS information into the HPD and to download delivery preference files from HPD in Salesforce
NJ HPD		The Health Provider Directory manages delivery preferences for providers.

Pre-Production Machines:

Machine Name	Machine IP	Machine Purpose
NJHN-BSCY-NJ-TOCINF-FOC-01		Informatica server to load ACRS information into the HPD and to download delivery preference files from HPD in Salesforce
NJ HPD Sandbox		Staging area for testing of uploads prior to deployment

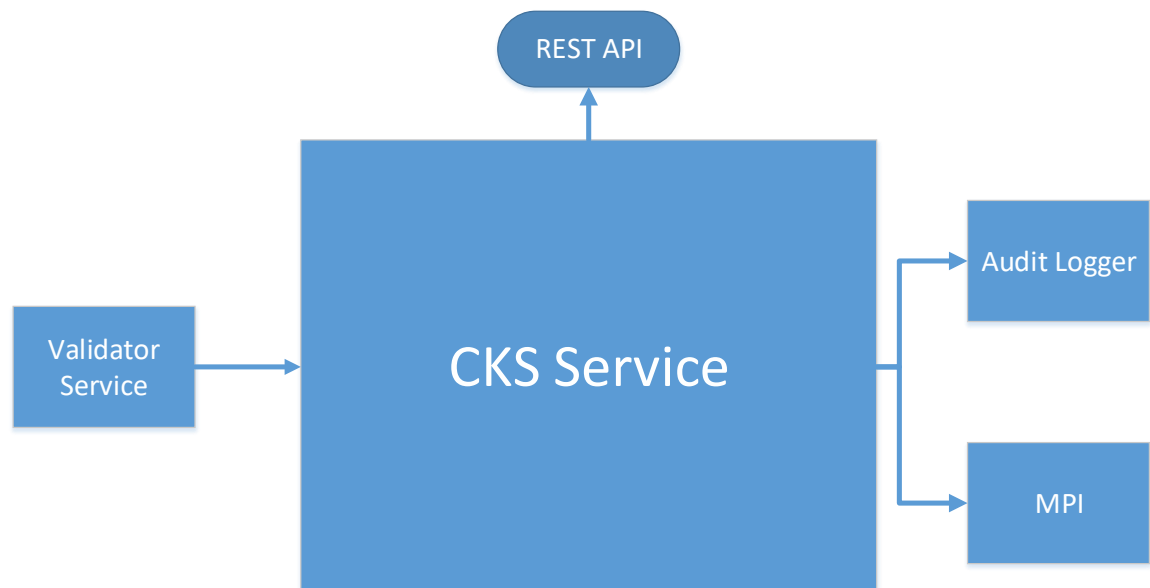
6. The Common Key Service (CKS)

The common key service enables a strong identifier (the common key) to be shared amongst disjoint health care organizations in order to improve patient matching. The common key service leverages an MPI (4Medica) to assign unique common keys to patients.

The common key service performs several major functions

1. Generates secure tamper resistant common keys for the MPI to assign to unique individuals
2. Manages messaging changes to common keys to listening clients
3. Takes FHIR REST demographic queries for common keys and interacts with the MPI to return results.
4. Supports batch (via ACRS files) and real time communication methods

The Architecture is below



Production Machines:

Machine Name	Machine IP	Machine Purpose
NJHN-BSCY-NJ-CKS-FIP-01		The Common Key Service server

MPI		The 4Medica MPI is leveraged for storing, determining unique individuals, and for query of common keys
NJHN-BSCY-NJ-VALIDATOR-FIP-01		Validated ACRS files are processed for the CKS service to assign common keys.

Pre-Production Machines:

Machine Name	Machine IP	Machine Purpose
NJHN-BSCY-NJ-CKS-FOC-01		The Common Key Service server
MPI		The 4Medica MPI is leveraged for storing, determining unique individuals, and for query of common keys
NJHN-BSCY-NJ-VALIDATOR-FOC-01		Validated ACRS files are processed for the CKS service to assign common keys.

7. MIDIGATE

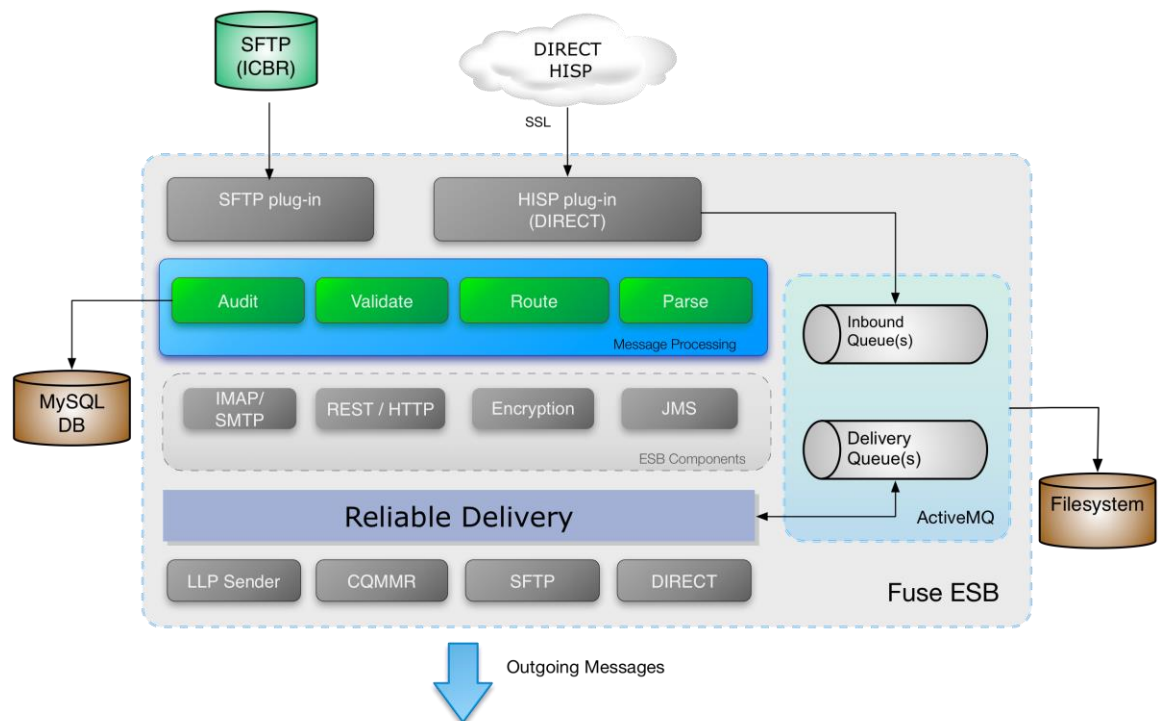
MIDIGATE catches DIRECT secure message with health care data attached, detaches the health care data, and routes it to the appropriate destination

The DIRECT addresses used for NJ that will have their attachments caught, detached, and routed are below:

immunization.nj@direct.mihin.org - Routed to RHAPSODY VXU port

adt.nj@direct.mihin.org - Routed to RHAPSODY TOC port.

A diagram of the solution is below.



Production Machines:

Machine Name	Machine IP	Machine Purpose
NITOR HISP		The HISP that MiDIGATE communicates with
NJHN-BSCY-NJ-MIDI-FIP-01		The MiDIGATE service
NJHN-BSCY-NJ-RHAP-FIP-01		Receives VXU and ADT's sent over DIRECT.

Pre-Production Machines:

Machine Name	Machine IP	Machine Purpose
NITOR HISP		The HISP that MiDIGATE communicates with
NJHN-BSCY-NJ-MIDI-FOC-01		The MiDIGATE service
NJHN-BSCY-NJ-RHAP-FOC-01		Receives VXU and ADT's sent over DIRECT.