Understanding the IZ Gateway and how to implement it within your IIS

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AIRA National Meeting 2021

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Agenda

- What is the IZ Gateway
- Why do we need the IZ Gateway
- How do we implement this in the IIS
- Onboarding

What is the IZ Gateway

- The Immunization (IZ) Gateway is a data exchange hub that enables efficient data exchange between critical immunization information systems across the nation. (1)

- (1) https://www.cdc.gov/vaccines/covid-19/reporting/iz-gateway/information-sheet.html

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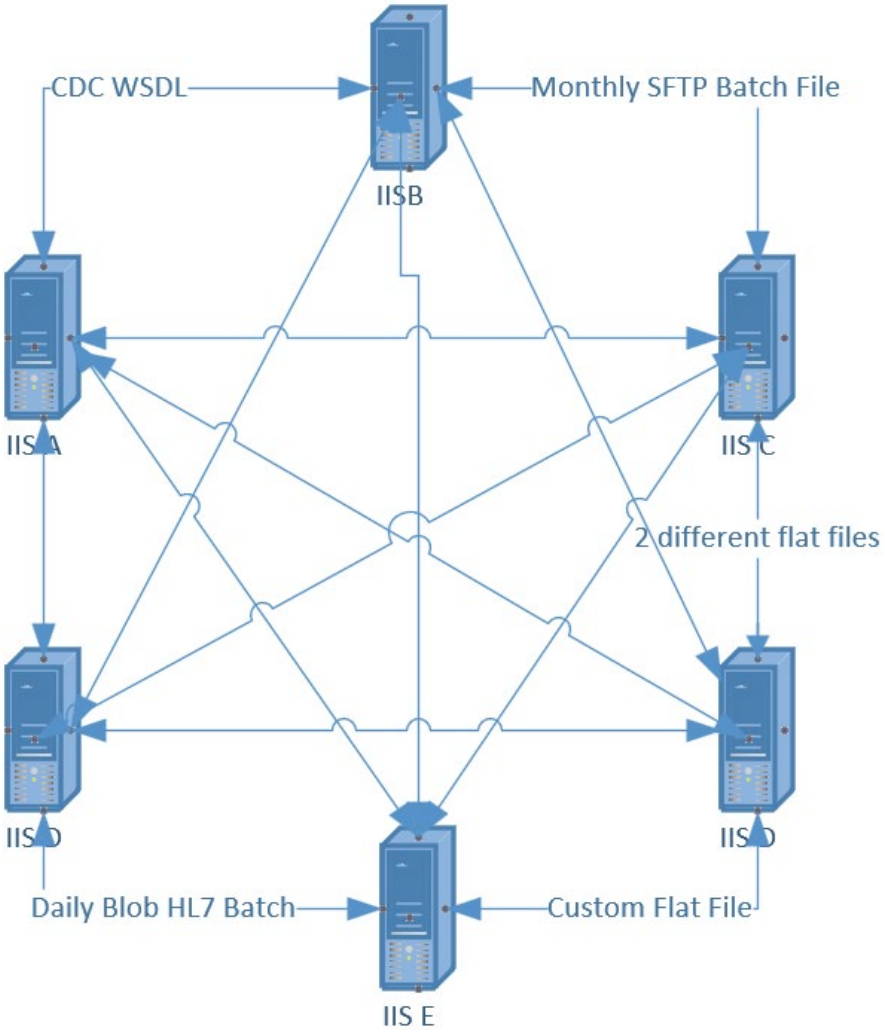
Fully Connected Topology



6 IIS

15 Unique Production Connections

- URLs/Credentials
- HL7/Batch/Flatfile
- SFTP/Blob/SOAP/Rest

30 Unique Production and Test Connections

62 IIS

1,891 Unique Production Connections

3,782 Unique Production and Test Connections

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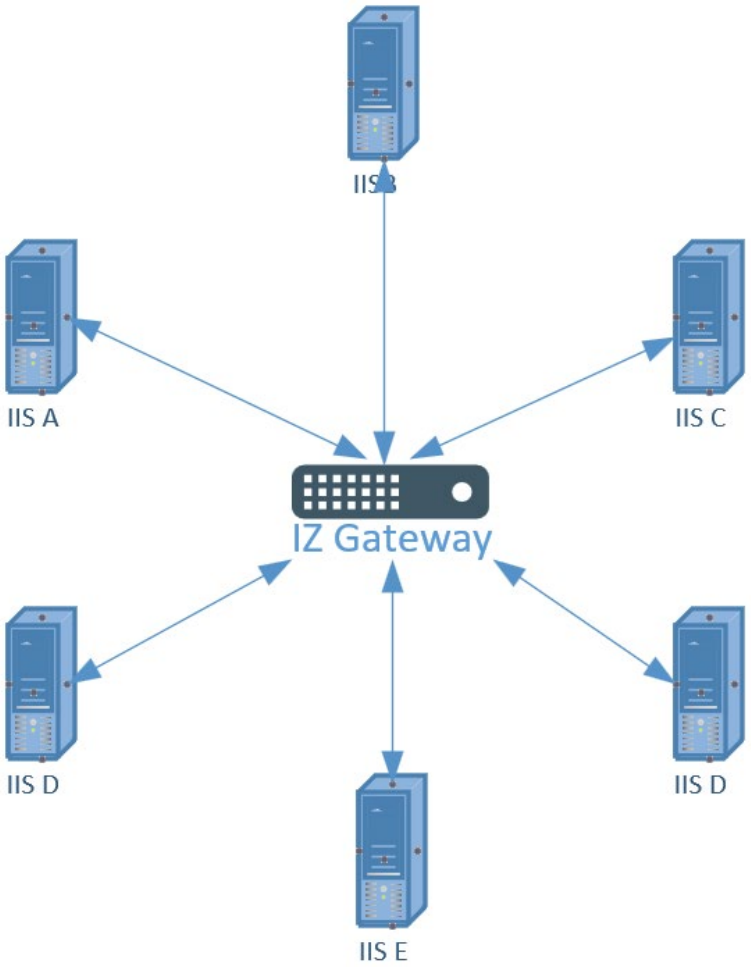
Star Topology



- 6 IIS
  - 6 Unique Production Connections
  - 12 Unique Production and Test Connections
- 62 IIS
  - 62 Unique Production Connections
  - 124 Unique Production and Test Connections

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No exchange of URLs, custom credentials, custom files, etc.

Why do we need the IZ Gateway

- Provides a standardized approach for IIS-to-IIS exchange
- Provides a single connection for Federal Partners
  - Veteran Affairs
  - Federal Bureau of Prisons
  - etc.

- Allows one or more IIS to keep shared patients and immunizations in sync with each other *in near real time*

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How to call the IZ Gateway

- Dev - https://dev.phiz-project.org/IISHubService
- Prod - https://prod.phiz-project.org/IISHubService

- HL7 2.5.1
  - QBP - Query message
  - VXU - Update message

Terms - CDC WSDL

SOAP Envelope

Validate

```
<Envelope xmlns="http://www.w3.org/2003/05/soap-envelope">
   <Header />
   <Body>
      <submitSingleMessage xmlns="urn:cdc:iisb:2011">
         <username>OPTIONAL</username>
         <password>OPTIONAL</password>
         <facilityID>OPTIONAL</facilityID>
         <hl7Message><![CDATA[MSH|^~\&|Test EHR Application|X68||NIST Test Iz Reg|201207010822||VXU^V04^V
PID|1||MR-99922^^^NIST MPI^MR||Montgomery^Lewis^^^^^L||20010821|M
ORC|RE||IZ-783276^NDA
RXA|0|1|20110215||118^HPV^CVX|999|||01^Historical information - source unspecified^NIP001]]>
         </hl7Message>
      </submitSingleMessage>
   </Body>
</Envelope>
```

[HIMSS Immunization Integration Test Suite – SOAP Envelope](https://hl7v2-iz-cdc-testing.nist.gov/iztool/#/soapEnv)
https://hl7v2-iz-cdc-testing.nist.gov/iztool/#/soapEnv

https://www.cdc.gov/vaccines/programs/iis/technical-guidance/soap/downloads/transport-specification.pdf

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Terms - IZ Gateway WSDL

- IZ Gateway WSDL includes the parameters in the CDC WSDL and the following

Header: Destination Parameters

Parameter	Input/Output	Data type	Description
DestinationId	Input/Output	String	IIS destination code assigned by the IZ Gateway indicating the IIS destination or IIS destination hub the message is to be sent/received.

Source: IZ Gateway WSDL Formal Specification
CDC Awardee Sharepoint Site

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Terms - Certificates

- Can be used to trust a site (server)
- Can be used to encrypt communications with a site
- Can be used to verify your identity (client)

- https://tldp.org/HOWTO/SSL-Certificates-HOWTO/x64.html
- https://www.websecurity.digicert.com/security-topics/client-certificates-vs-server-certificates

Certificate Tips

- Start this process early.
  - You need to get some paperwork notarized before you can signup in Digicert
  - From Digicert you can submit a Certificate Signing Request (CSR)

- Certificates expire after 12 months.
  - *Try to submit requests for development and production client certificate at the same time.*

How to call the IZ Gateway

SOAP Envelope

DestinationId +

```
<Envelope xmlns="http://www.w3.org/2003/05/soap-envelope">
   <Header />
   <Body>
      <submitSingleMessage xmlns="urn:cdc:iisb:2011">
         <username>OPTIONAL</username>
         <password>OPTIONAL</password>
         <facilityID>OPTIONAL</facilityID>
         <hl7Message><![CDATA[MSH|^~\&|Test EHR Applicatio
PID|1||MR-99922^^^NIST MPI^MR||Montgomery^Lewis^^^^^L||200
ORC|RE||IZ-783276^NDA
RXA|0|1|20110215||118^HPV^CVX|999|||01^Historical informat
         </hl7Message>
      </submitSingleMessage>
   </Body>
</Envelope>
```

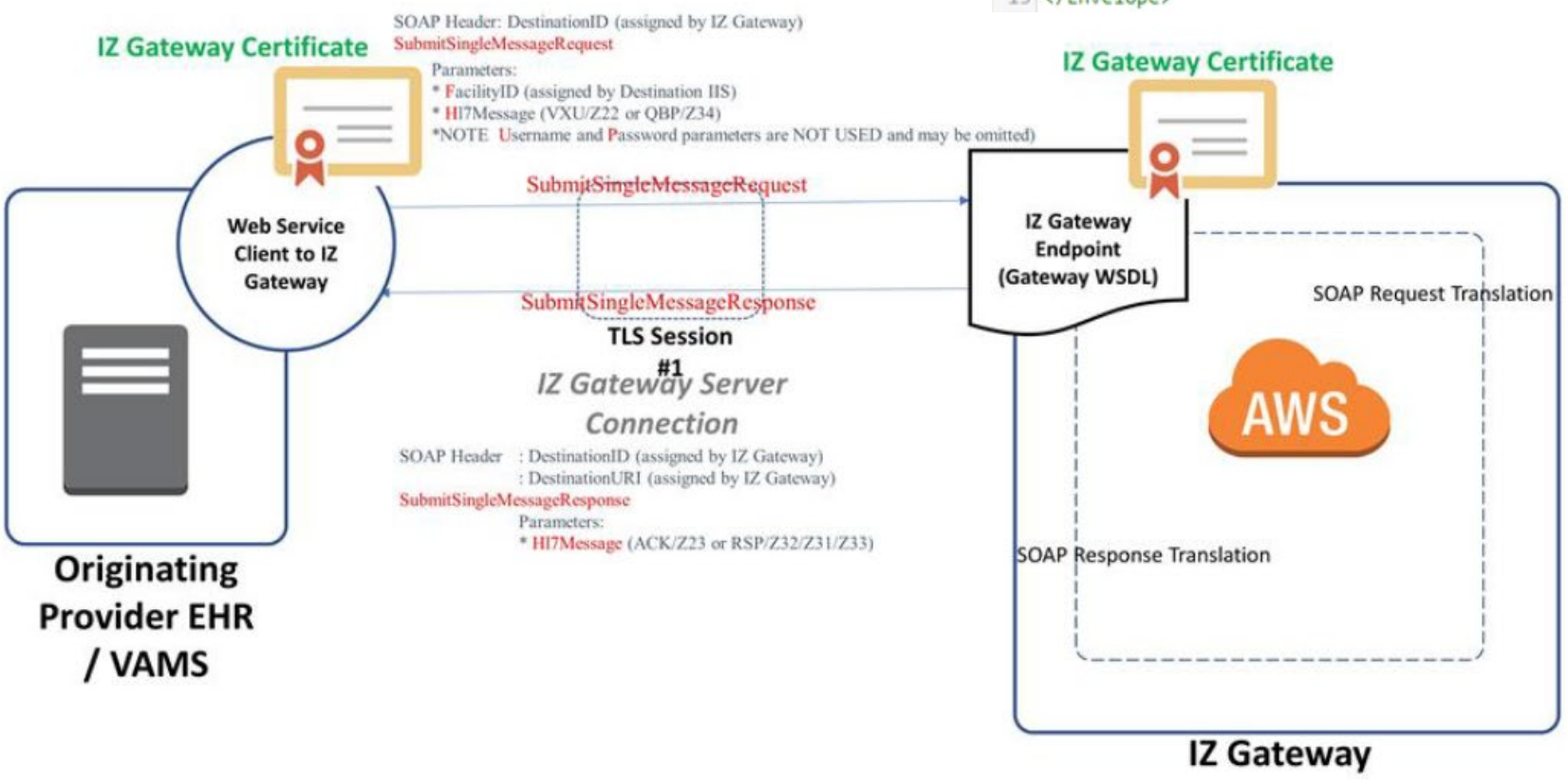

Figure 3: Immunization Message Requests to IZ Gateway Server

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Source: Technical Specifications for Immunization Information Systems (IISs) to Exchange Data via IZ Gateway

How to call the IZ Gateway – Step I - Problems

Client certificate may be expired or permissions lost
Client must trust SSL certificate
IZ Gateway may be down
IZ Gateway server certificate may be expired

Faults
Destination ID is not registered
Unable to invoke destination IIS

- Destination IIS SSL certificate
- IZ Gateway account issues
- IZ Gateway user can not send for the facility yet

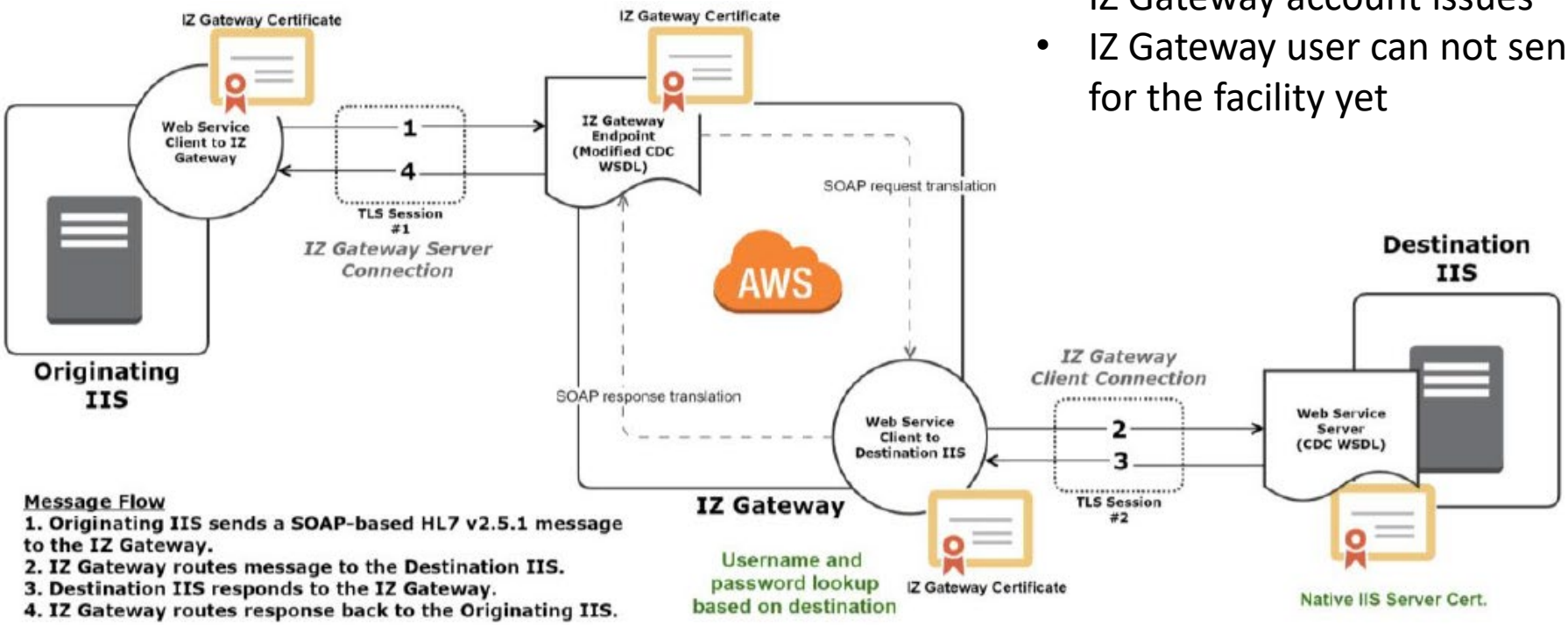

Figure 2: IIS-to-IIS Data Exchange of Vaccination Information through IZ Gateway

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Source: Technical Specifications for Immunization Information Systems (IISs) to Exchange Data via IZ Gateway

Help diagnose with multiple points of failure

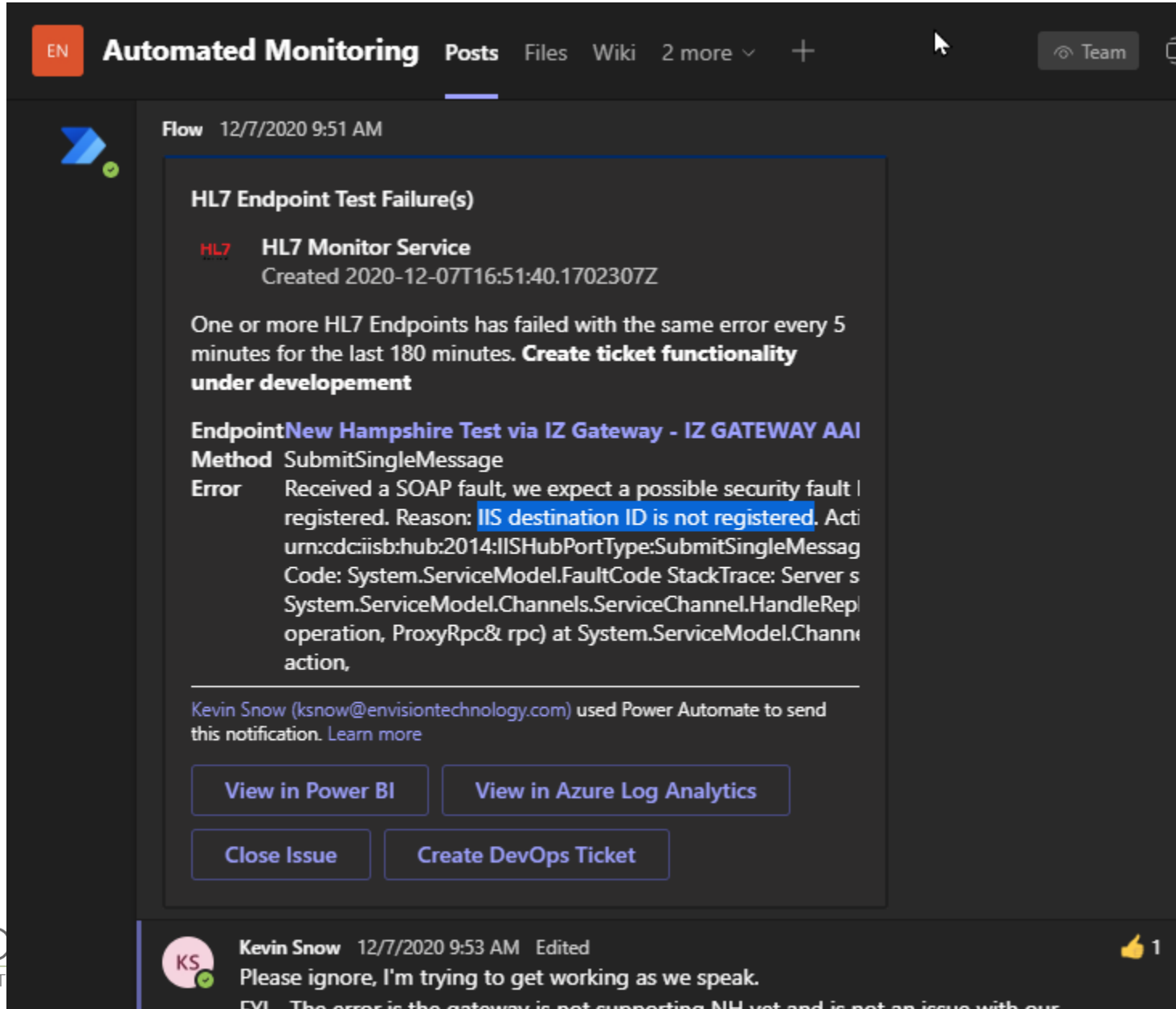
Endpoints by Monitored Method

HI7EndpointName	ConnectivityTest	Total
⊞ ONC PHIZ Hub - Dev - Client	100.00 %	**100.00 %**
Total	**100.00 %**	**100.00 %**

Endpoints by Monitored Method

HI7EndpointName	ConnectivityTest	KeepAlive	SubmitSingleMessage	Total
⊞ Delaware Test CDC	100.00 %			**100.00 %**
⊞ Delaware Test Service.asmx	100.00 %			**100.00 %**
⊞ Delaware Test via IZ Gateway - Automated Connecticut Account			100.00 %	**100.00 %**
⊞ Delaware Test via IZ Gateway - Automated Louisiana Account			100.00 %	**100.00 %**
⊞ Delaware Test via IZ Gateway - Automated Maryland Account			100.00 %	**100.00 %**
⊞ Delaware Test via IZ Gateway - Automated Mississippi Account			100.00 %	**100.00 %**
⊞ Delaware Test via IZ Gateway - Automated Nevada Account			100.00 %	**100.00 %**
⊞ Delaware Test via IZ Gateway - Automated New Mexico Account			100.00 %	**100.00 %**
⊞ Delaware Test via IZ Gateway - Automated Philly Account			100.00 %	**100.00 %**
⊞ Delaware Test via IZ Gateway - Automated West Virginia Account			100.00 %	**100.00 %**
⊞ Delaware Test via IZ Gateway - IZ GATEWAY AART TEST Account			100.00 %	**100.00 %**
⊞ Delaware Test via IZ Gateway - UI Connecticut Account			100.00 %	**100.00 %**

Alert on pinpointed failure



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Outside of scope

- There are HL7 Message specific changes for IIS-to-IIS exchange
  - All Immunizations are passed as historical
    - RXA-11.4 is left empty (Administered At Location.Facility)
  - Each IIS determines their own facility code
    - Registry Facility Code appears in MSH-4 (Sending Facility)
  - If two IIS are state registries, the IIS being called is assigned the Patient Identifier type of State Registry (SR)
    - Not all registries are *State* Registries. Ex. Philadelphia
  - Etc.

For the complete list see “Immunization (IZ) Gateway HL7 Implementation Guide”

How to receive messages from the IZ Gateway

1. Provide the IZ Gateway the URL to your CDC WSDL

2. Create a single IZ Gateway username/password

3. Setup the destination IIS and THEIR facility code in your IIS

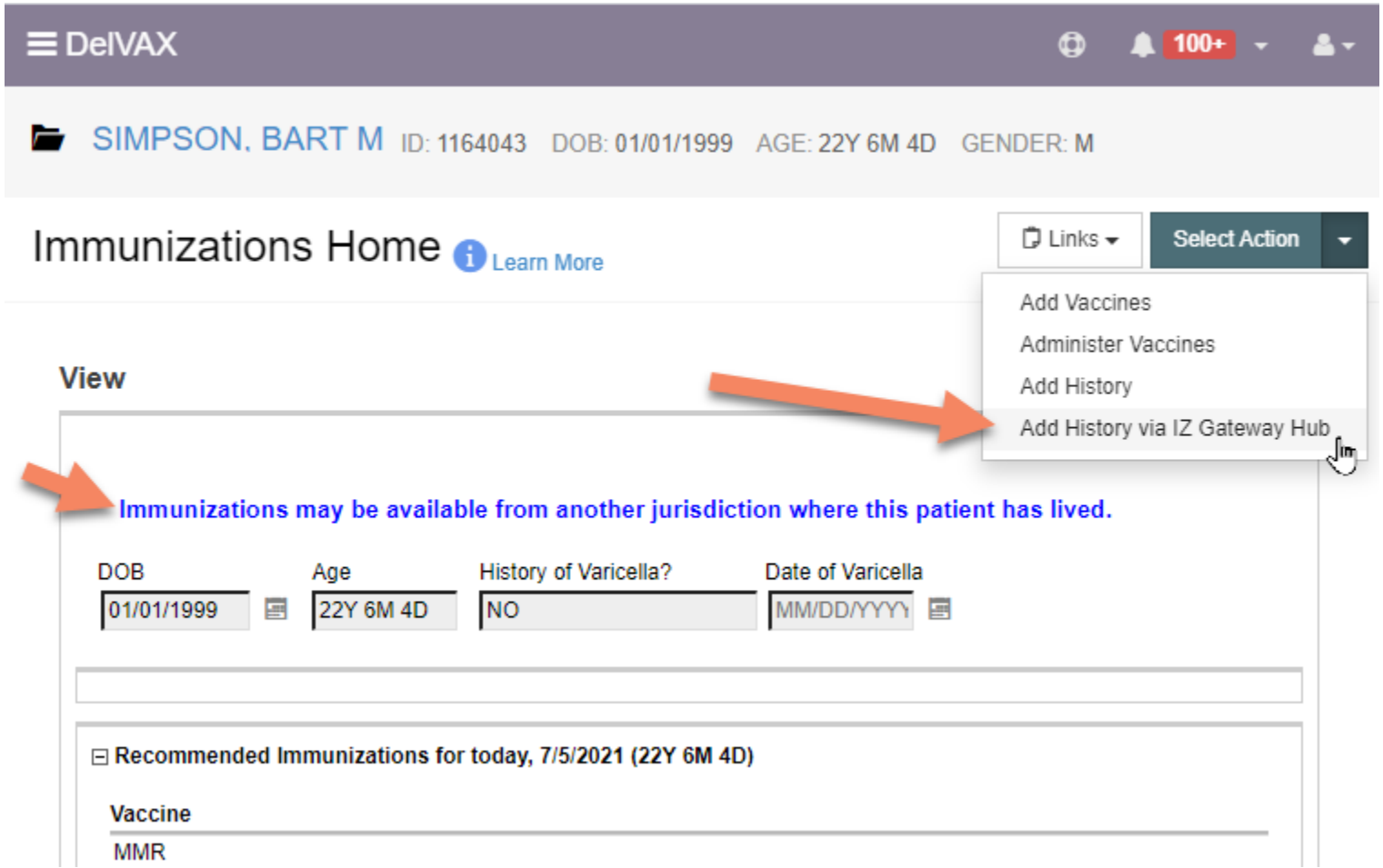
4. Assign which facilities the IZ Gateway is allowed to send for

Manual Query – Demo

- Video
- Screen Shots

Manual Query – Demo (VID)

Manual Query – Demo (Screen Shots 1/6)
If address exists in partner jurisdiction



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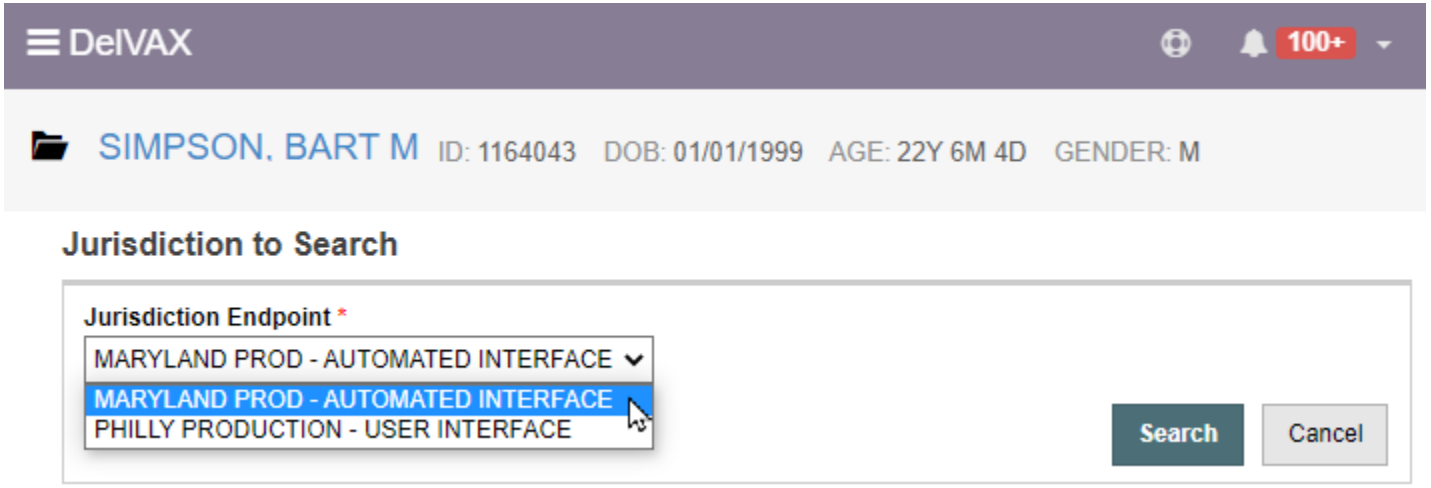
Manual Query – Demo (Screen Shots 2/6)

If patient has had a physical address in more than one partner jurisdiction



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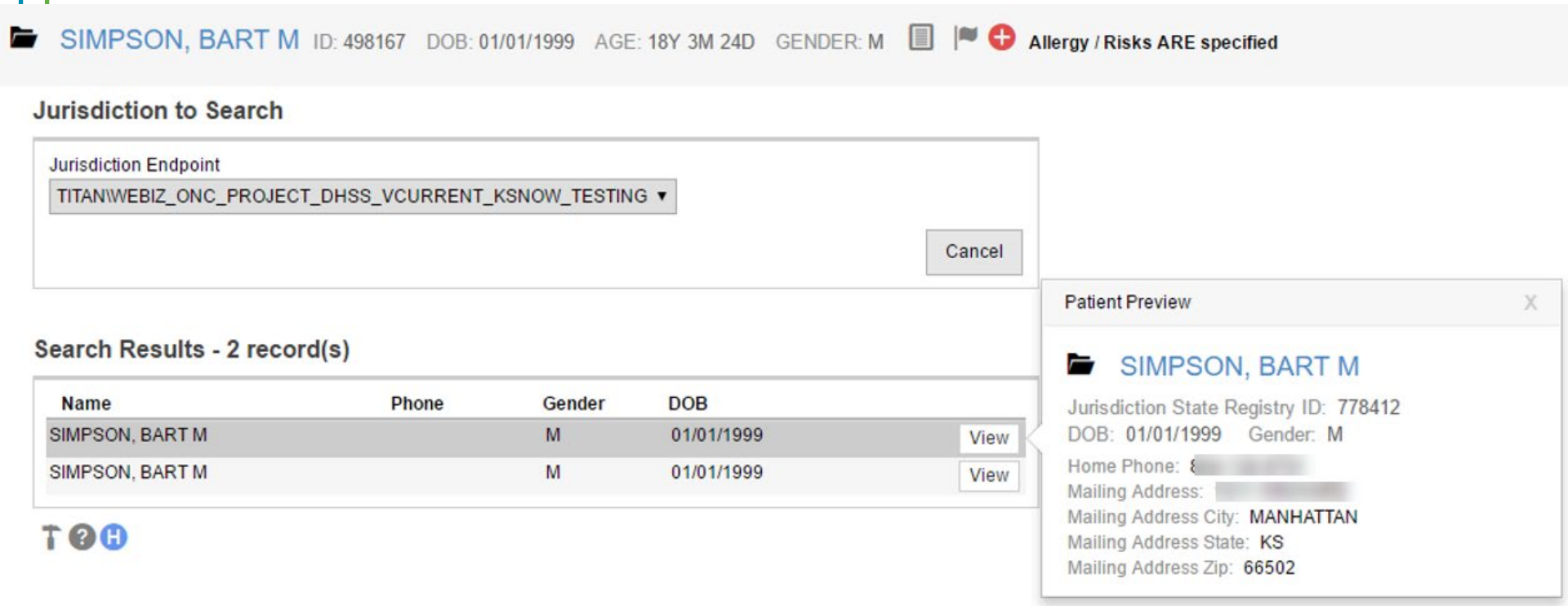
Manual Query – Demo (Screen Shots 3/6)
More than one patient match



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Manual Query – Demo (Screen Shots 4/6)

Single patient match – Select Immunizations

Jurisdiction to Search

Jurisdiction Endpoint

PHILLY PRODUCTION - USER INTERFACE

Cancel

Search Results - 1 record(s)

Name	Phone	Gender	DOB
SIMPSON, BART M		M	01/01/1999

15 Immunization(s)

	Vaccination Date	Vaccination
☐	01/01/1999	Hep B, ped/adol (CVX: 08)
☐	01/30/2015	Influenza InjPF Quad (CVX: 150)
☐	01/01/2016	Hep B, ped/adol (CVX: 08)
☐	09/24/2018	HPV4 (Gardasil) (CVX: 62)
☐	09/24/2018	Hep B, adult (CVX: 43)

Patient Preview X

SIMPSON, BART M

Jurisdiction Local Registry ID: 2287847
DOB: 01/01/1999
Gender: M
Home Phone:
Mother's Maiden Name: SIMPSON
Mailing Address:
Mailing Address City: DOVER
Mailing Address State: DE
Mailing Address Zip: 19901
Physical Address: 1011
Physical Address City: DOVER
Physical Address State: DE
Physical Address Zip: 19901

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Manual Query – Demo (Screen Shots 5/6)

Single patient match – Select Immunizations

☐	03/16/2020	Smallpox (CVX: 75)
☐	04/20/2020	Adenovirus, type 7 (CVX: 55)
☐	04/21/2020	BCG (CVX: 19)
☐	04/21/2020	Rubella/Mumps (CVX: 38)

Import Immunizations

Immunization Preview

Rubella/Mumps (CVX: 38)

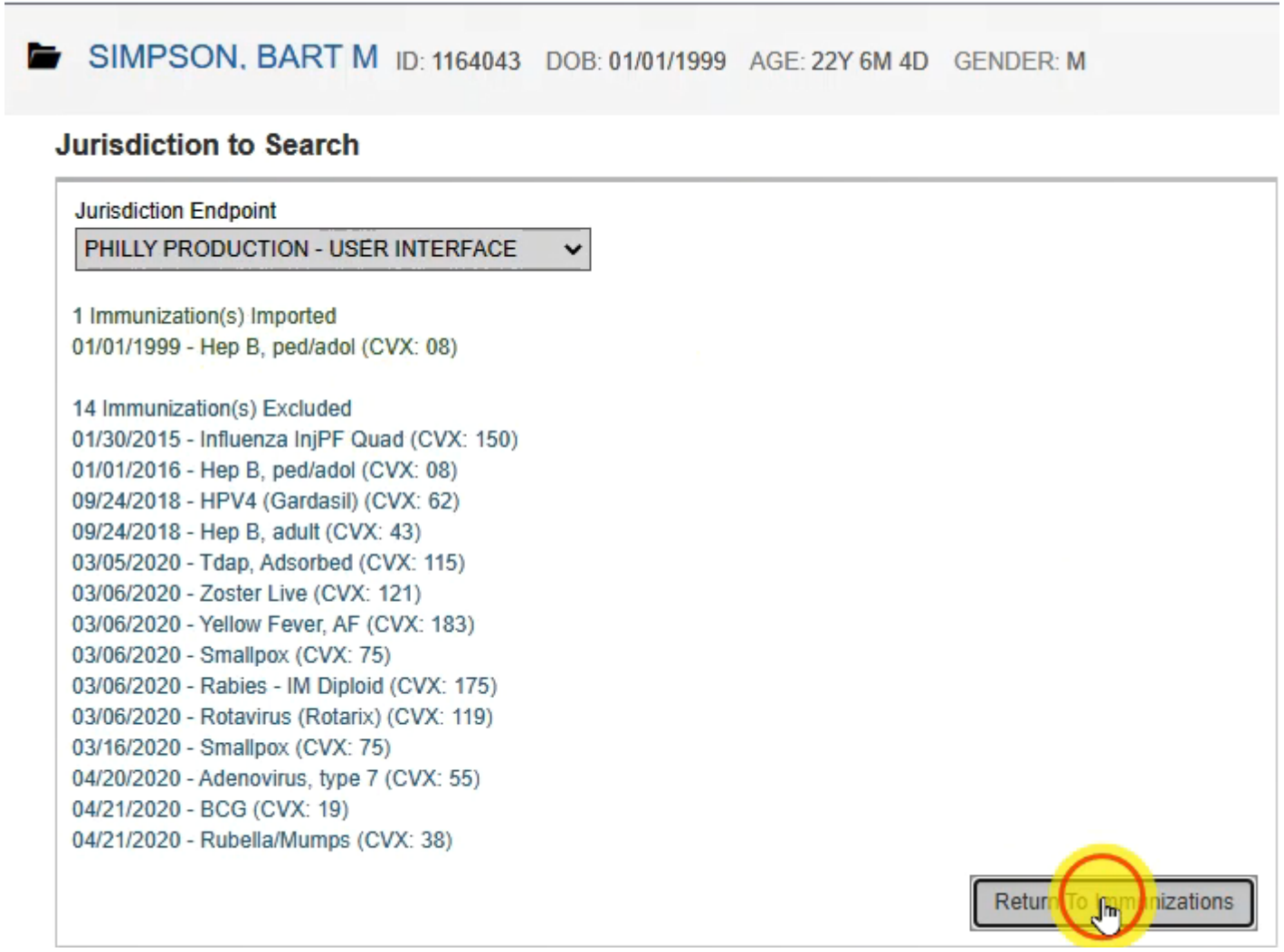
Administered Amount: 999
Substance Manufacturer: MSD
Substance Lot Number: 432423423
System Entry Date: 04/21/2020

Existing Immunization(s)

Vaccination Group	Date(s)
DTaP / TD / Tdap	03/05/2020
Hep B	01/01/1999, 01/01/2016, 09/24/2018
HPV	09/24/2018
Influenza	01/30/2015
MMR	04/21/2020
Other	03/06/2020, 03/08/2020, 03/16/2020, 04/20/2020, 04/21/2020
Rabies	03/06/2020
Rotavirus	03/06/2020
Yellow Fever	03/06/2020
Zoster	03/06/2020

Manual Query – Demo (Screen Shots 6/6)

Single patient match – Import Immunizations Confirmation



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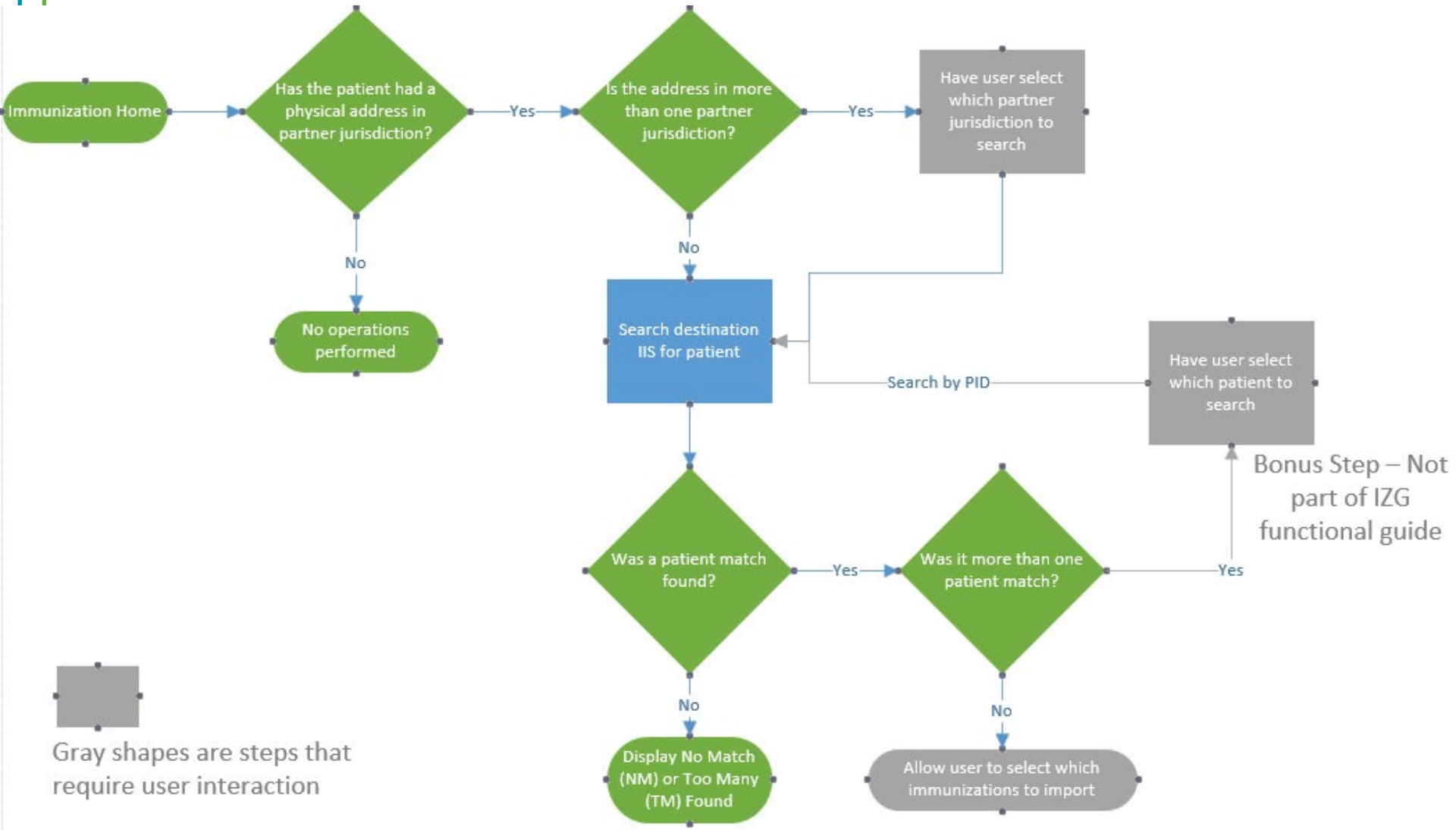
Manual Query - Flows



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Manual Query - Summary

- Pros
  - Provides user control over decisions
  - Makes IIS-to-IIS testing easier
- Cons
  - More flows = More work
  - Can be redundant

Automated Exchange

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IZ Gateway Hub Endpoint

Endpoint Name *
MARYLAND PROD - AUTOMATED INTERFACE

Active ☑
Poison ☐

Description
THIS IS THE ENDPOINT THAT WILL BE USED BY THE AUTOMATED INTERFACE TO CALL MARYLAND

Display Order *
10

Comments
THIS IS THE ENDPOINT SETUP WE WILL USE IN THE AUTOMATED INTERFACE TO CALL MARYLAND
ENDPOINT BEING SET TO POISONED DUE TO MORE THAN 10 FAILURES IN THE LAST 2 MINUTE(S). LAST

Environment

Assigned Hub *
PHIZ PRODUCTION HUB

Assigned Application *
/DELVAX

Assigned Environment *
PRODUCTION

Endpoint State *
MARYLAND

Endpoint City (CSV format)

Connectivity

Endpoint URL *
https://immunet.dhmh.maryland.gov/IISHubService/hub_Service?wsdl

Use in Automated Interface ☑
Use in User Interface ☑

Destination Id *
md

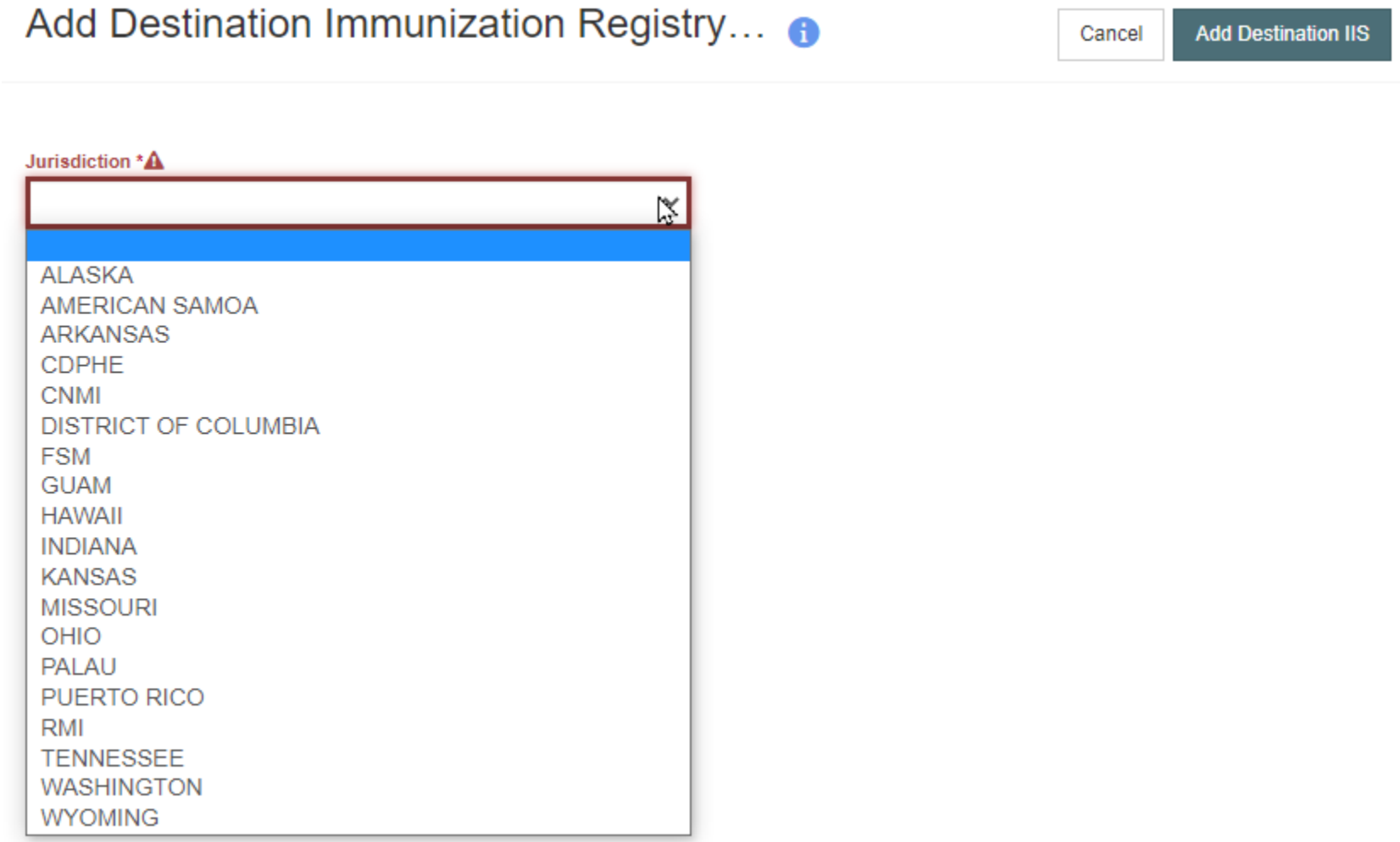
HI7 Facility Code *

Value Override For Sending Facility

Value Override for SOAP Facility Id

Max Messages Per Minute (0 for no limit)
0

Vendor Tip - Templates



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Automated Exchange - Jobs

Job Types

Non Job Logs

IZ GATEWAY - HL7 MESSAGE QUEUE - POPULATE	MAKE A CALL TO POPULATE THE QUEUE WITH PATIENTS THAT NEED TO BE PUSHED/PULLED	BETWEEN 08:00 AM AND 05:59 PM, ONLY ON MONDAY, TUESDAY, WEDNESDAY, THURSDAY, AND FRIDAY	YES	COMPLETE *07/06/2021*		Job Type Detail
IZ GATEWAY - HL7 MESSAGE QUEUE - PROCESS	PROCESS THE QUEUE WHICH SHOULD ATTEMPT TO AUTOMATICALLY PUSH/PULL HL7 MESSAGES VIA THE IZ GATEWAY	AT 30 MINUTES PAST THE HOUR, BETWEEN 09:00 AM AND 04:59 PM, ONLY ON MONDAY, TUESDAY, WEDNESDAY, THURSDAY, AND FRIDAY	YES	COMPLETE *07/06/2021*		Job Type Detail

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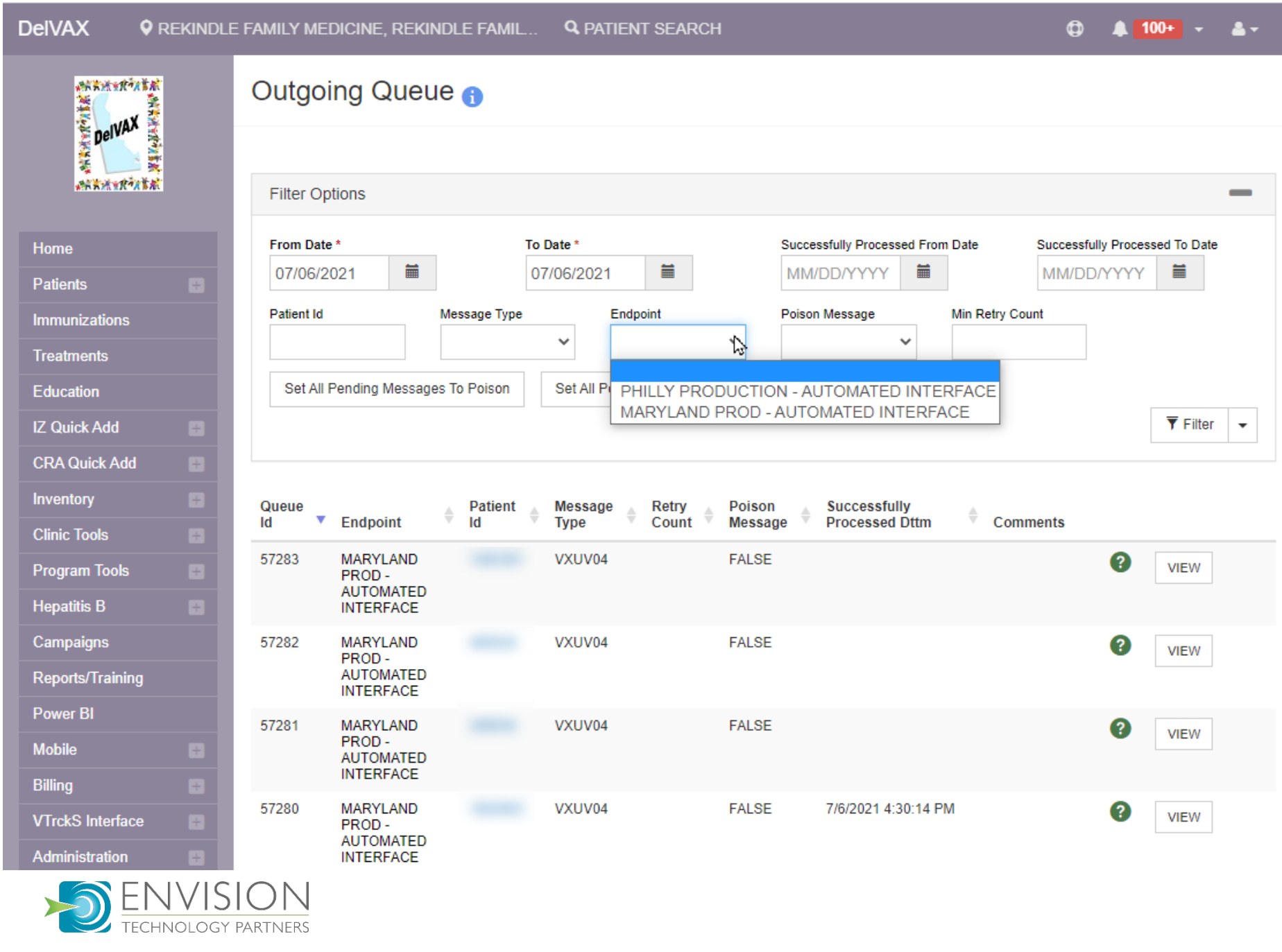
Tips

- Running the exchange during standard business hours to help avoid scheduled downtime

- Transform a single patient match RSP (Query Response) into a VXU to import the data from the query results



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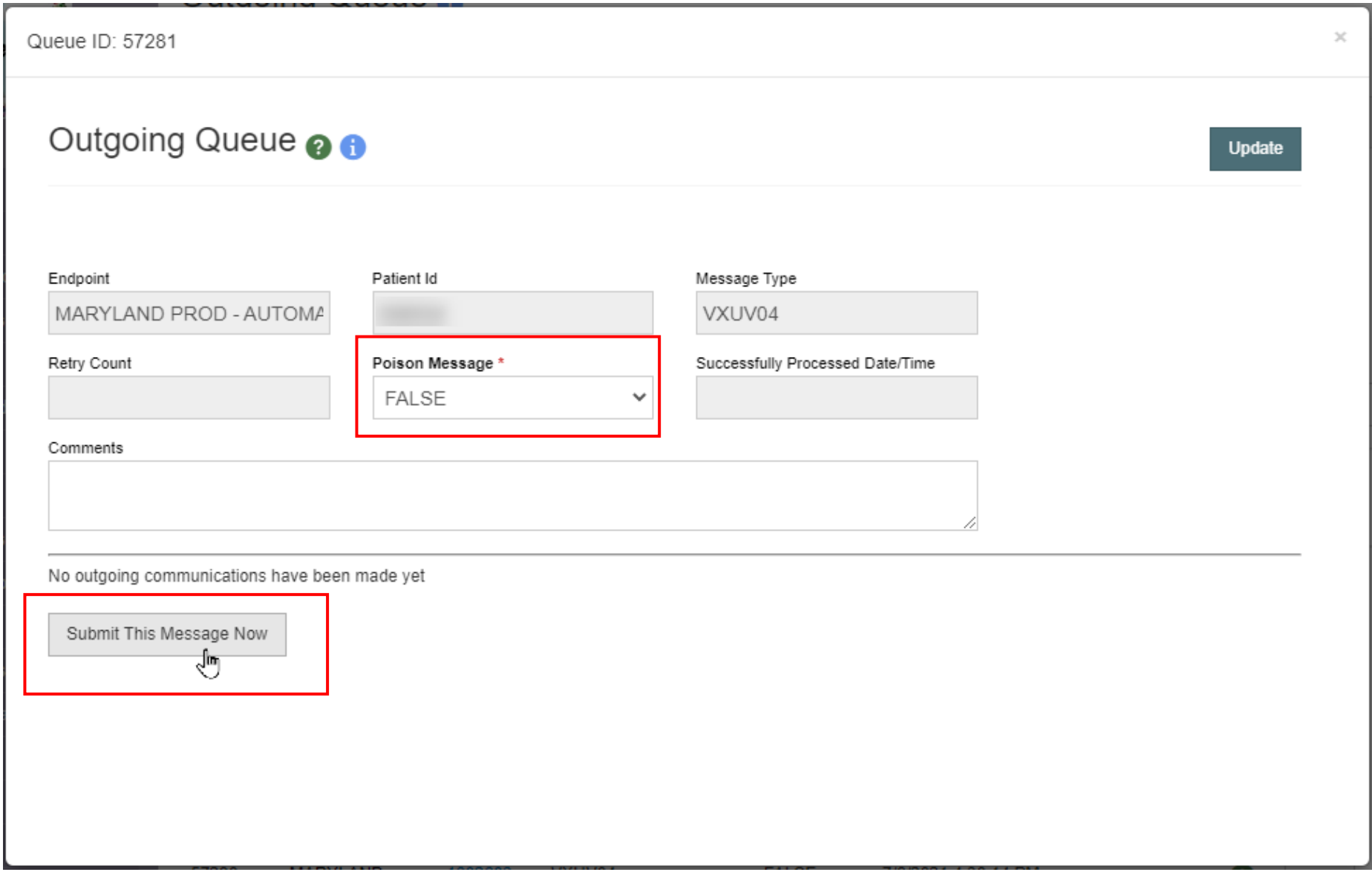
Ability to manage all aspects of working with the IZ Gateway with-in the registry



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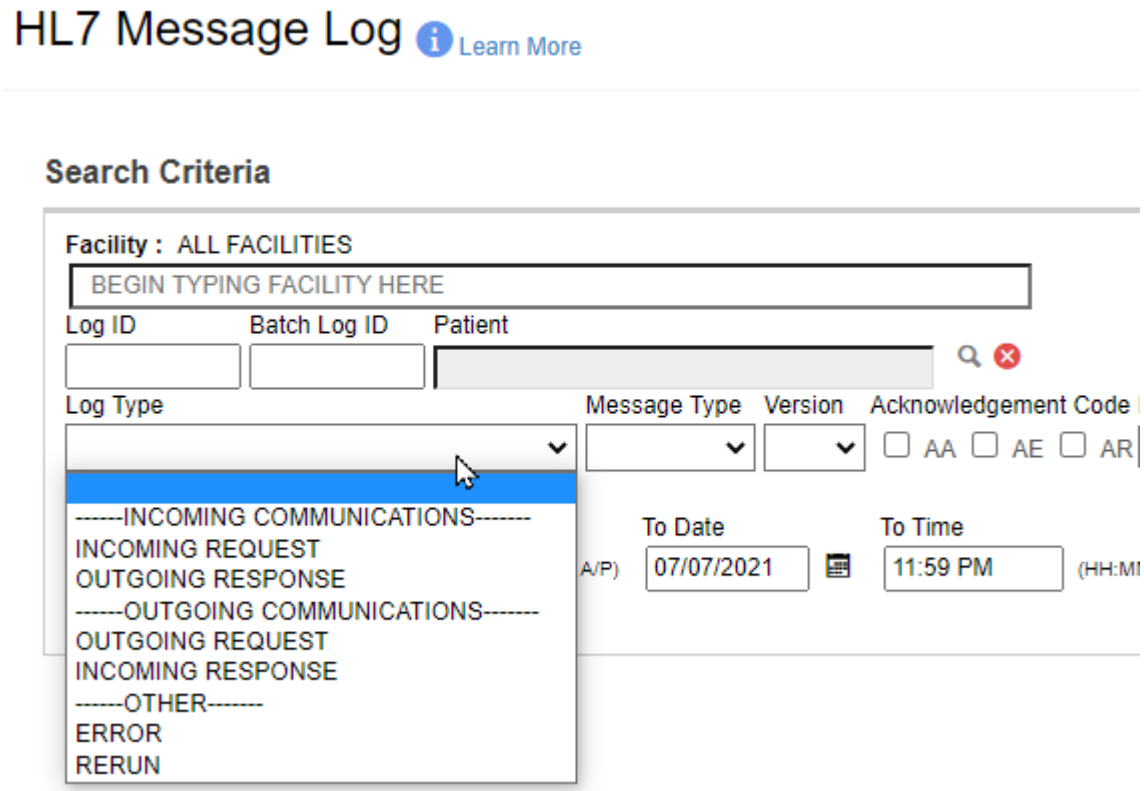
Logging

- Have a clean way of identifying IZ Gateway traffic for reports, etc.



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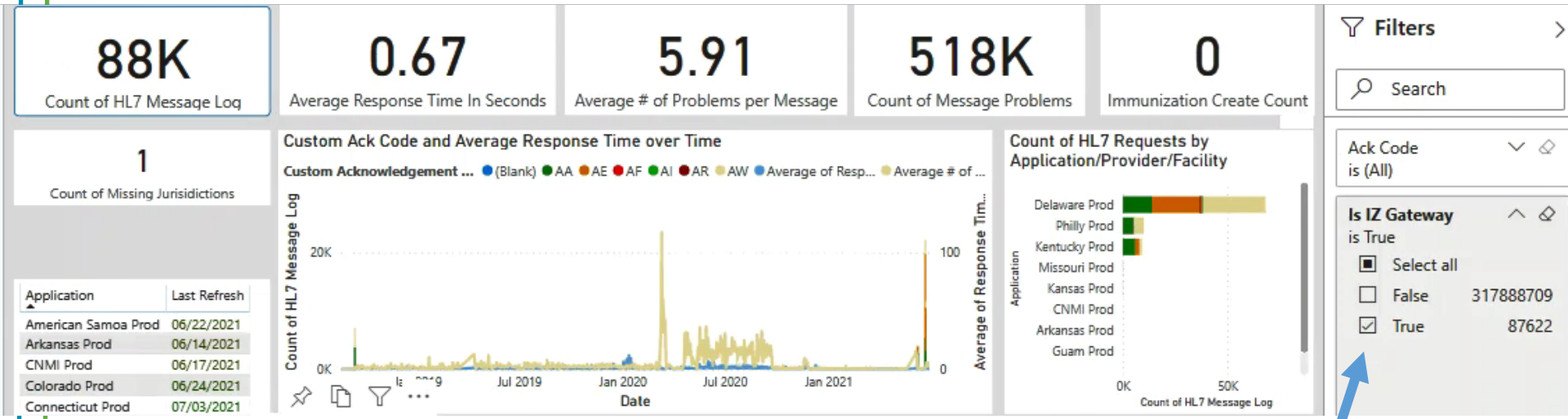
Identify IZ Gateway Traffic



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Onboarding

- Published Document: IIS to IIS Exchange Onboarding Checklist and Test Plan

Onboarding Tips

1. If you have a queue initially populate it to give your partner IIS an idea of what to expect
2. Send just one or two messages of both VXU and QBP to verify everything is working
3. Send a small chunk of messages to check for HL7 message context issues
4. Gradually progress up to a full historical exchange
5. Turn on the real time interface

Q&A

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