

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

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Chief Architect

Envision Technology Partners

AIRA National Meeting 2021

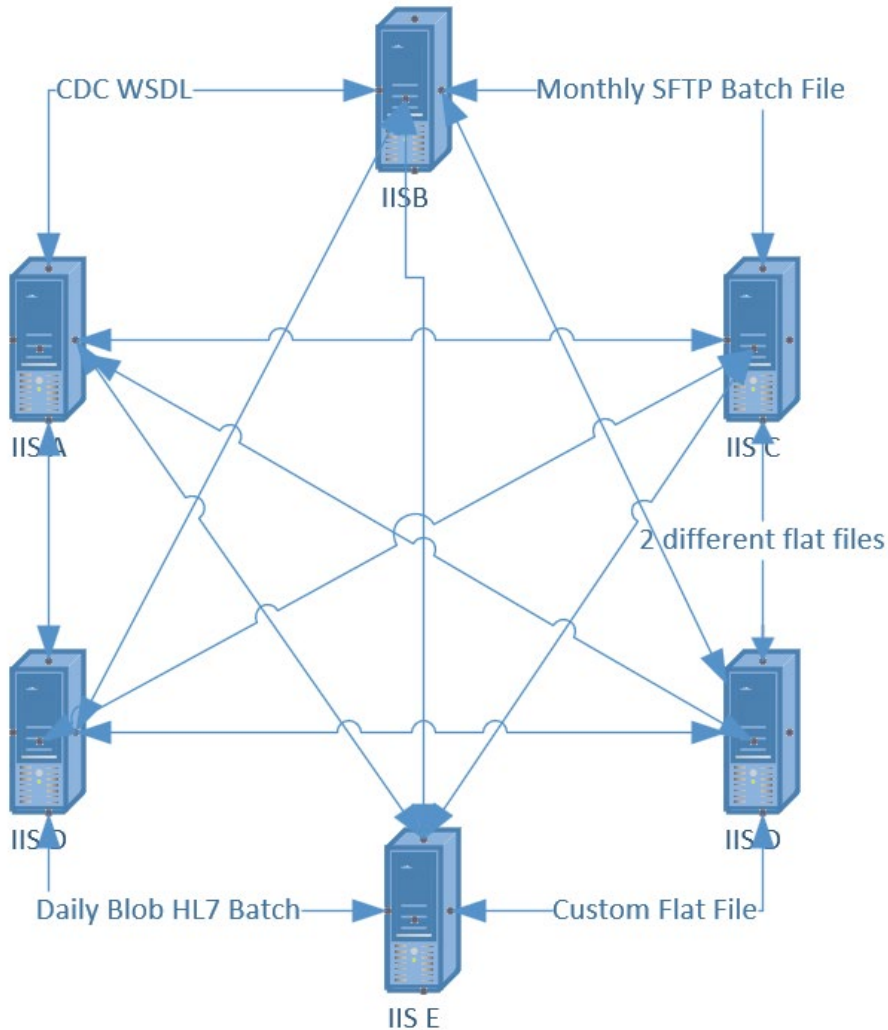
# Agenda

- 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>

# Fully Connected Topology



6 IIS

# 15 Unique Production Connections

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

# 30 Unique Production and Test Connections

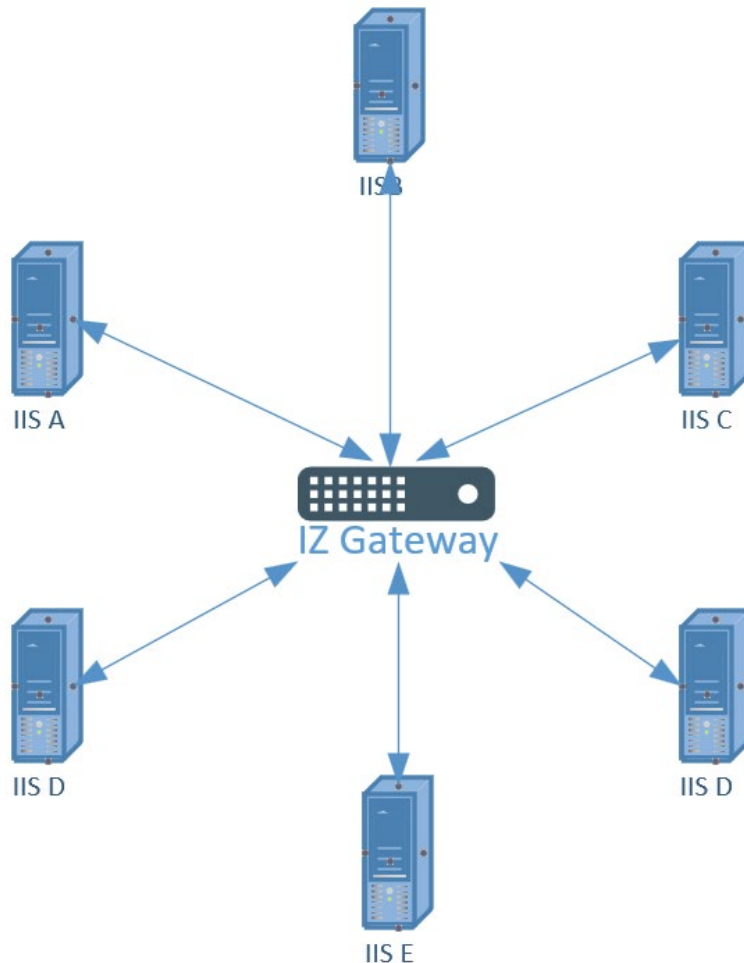
62 IIS

## 1,891 Unique Production Connections

## 3,782 Unique Production and Test

## Connections

# 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

# 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*

# 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

```
1 <Envelope xmlns="http://www.w3.org/2003/05/soap-envelope">
2   <Header />
3   <Body>
4     <submitSingleMessage xmlns="urn:cdc:iisb:2011">
5       <username>OPTIONAL</username>
6       <password>OPTIONAL</password>
7       <facilityID>OPTIONAL</facilityID>
8       <hl7Message><![CDATA[MSH|^~\&|Test EHR Application|X68||NIST Test Iz Reg|201207010822||VXU^V04^V
9 PID|1||MR-99922^^^NIST MPI^MR|Montgomery^Lewis^^^^^L|20010821|M
10 ORC RE|IZ-783276^NDA|
11 RXA|0|1|20110215||118^HPV^CVX|999|||01^Historical information - source unspecified^NIP001]]>
12     </hl7Message>
13   </submitSingleMessage>
14 </Body>
15 </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>



# 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

# 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

```

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

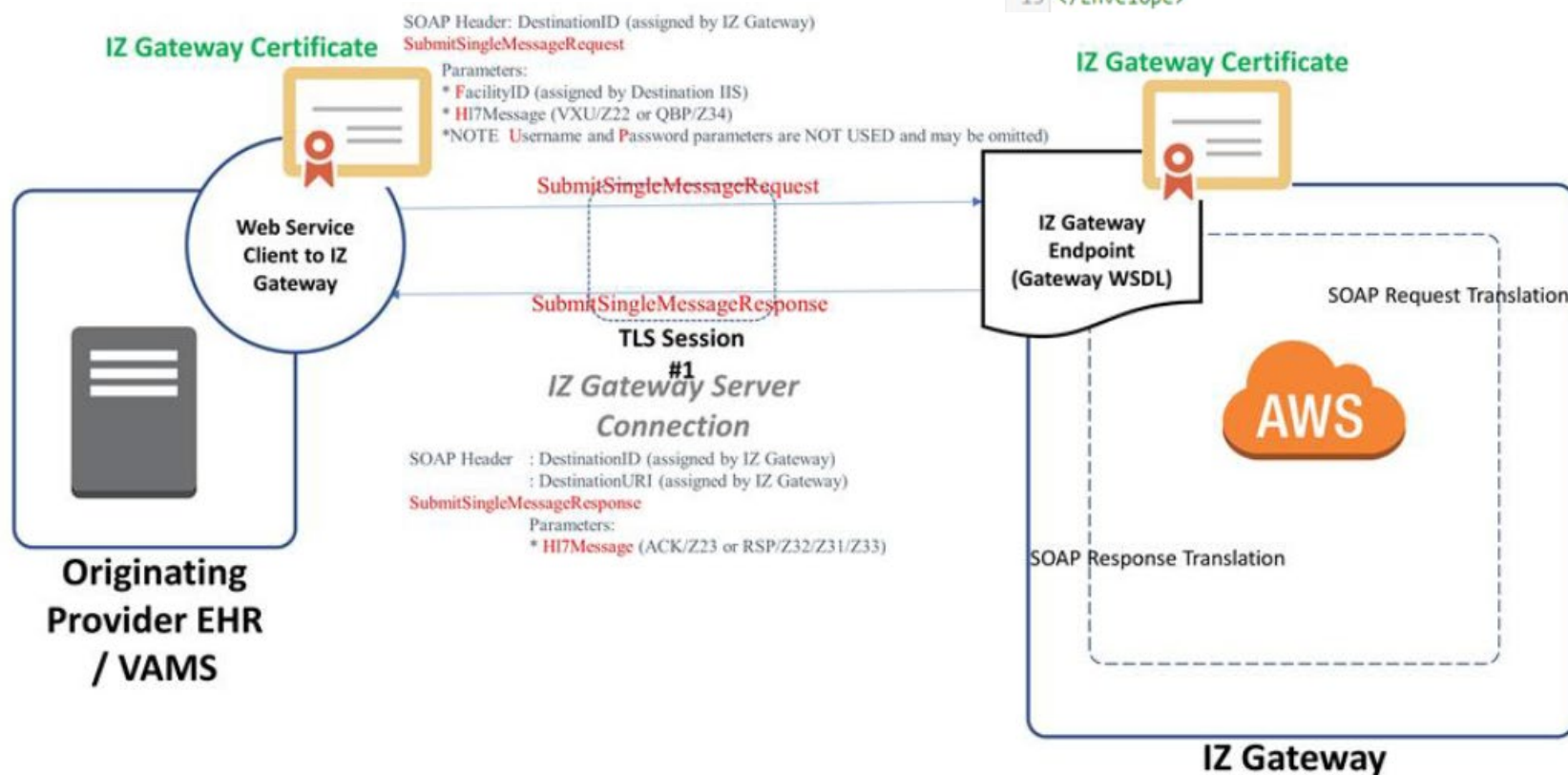


Figure 3: Immunization Message Requests to IZ Gateway Server

# How to call the IZ Gateway – Step I - Problems

Client certificate may be expired or permissions lost    Faults

Client must trust SSL certificate

IZ Gateway may be down

IZ Gateway server certificate may be expired

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

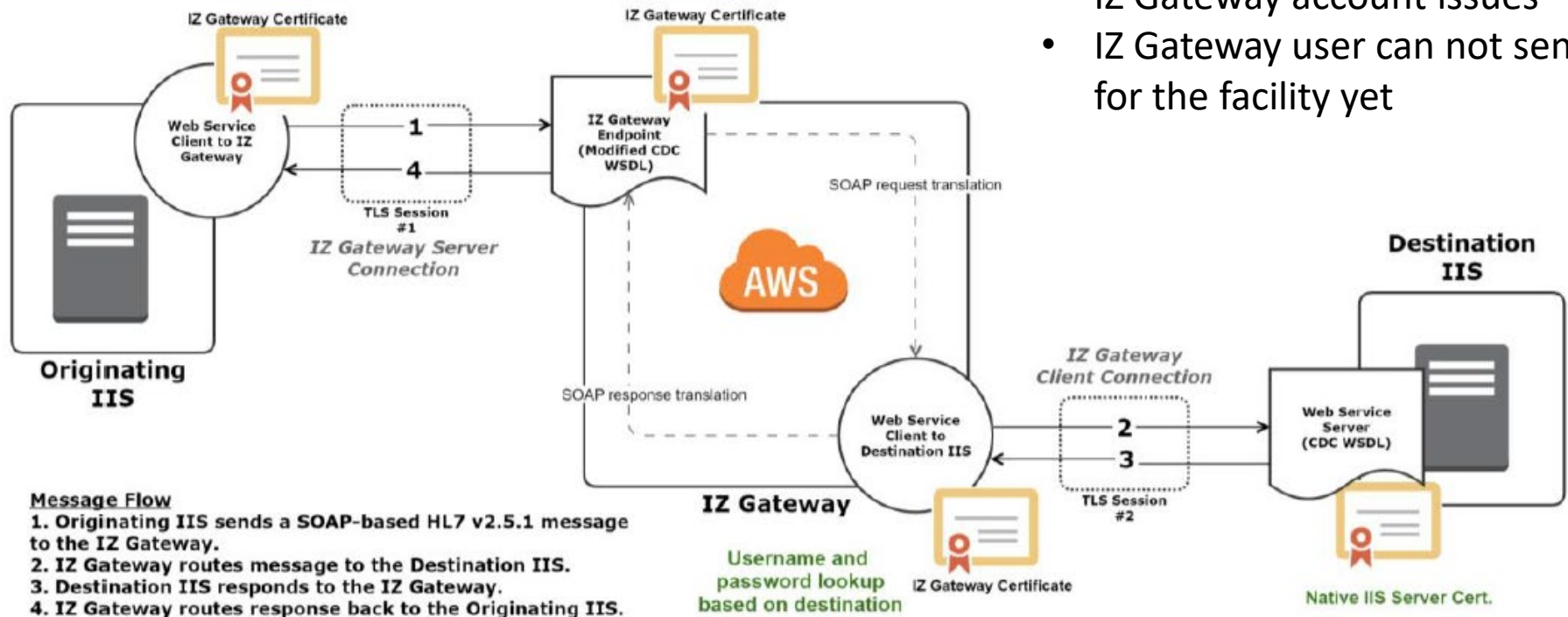


Figure 2: IIS-to-IIS Data Exchange of Vaccination Information through IZ Gateway

# Help diagnose with multiple points of failure

Endpoints by Monitored Method		
HI7EndpointName	ConnectivityTest	Total
⊞ ONC PHIZ Hub - Dev - Client	100.00 %	100.00 %
<b>Total</b>	<b>100.00 %</b>	<b>100.00 %</b>

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

EN

Automated Monitoring

Posts

Files

Wiki

2 more ▾

+

Team

Flow

12/7/2020 9:51 AM

### HL7 Endpoint Test Failure(s)

HL7

**HL7 Monitor Service**

Created 2020-12-07T16:51:40.1702307Z

One or more HL7 Endpoints has failed with the same error every 5 minutes for the last 180 minutes. **Create ticket functionality under development**

Endpoint

New Hampshire Test via IZ Gateway - IZ GATEWAY AAI

Method

SubmitSingleMessage

Error

Received a SOAP fault, we expect a possible security fault I registered. Reason: **IIS destination ID is not registered**. Action: cdc:isb:hub:2014:ILSHubPortType:SubmitSingleMessage Code: System.ServiceModel.FaultCode StackTrace: Server System.ServiceModel.Channels.ServiceChannel.HandleReply operation, ProxyRpc& rpc) at System.ServiceModel.Channels.action,

Kevin Snow (ksnow@envisiontechnology.com) used Power Automate to send this notification. [Learn more](#)

View in Power BI

View in Azure Log Analytics

Close Issue

Create DevOps Ticket

Kevin Snow

12/7/2020 9:53 AM

Edited

Please ignore, I'm trying to get working as we speak.

EVL The error is the gateway is not supporting NH yet and is not an issue with our

1

# 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

DeIVAX 100+

**SIMPSON, BART M** ID: 1164043 DOB: 01/01/1999 AGE: 22Y 6M 4D GENDER: M

Immunizations Home [Learn More](#)

**View**

Immunizations may be available from another jurisdiction where this patient has lived.

DOB: 01/01/1999 Age: 22Y 6M 4D History of Varicella? NO Date of Varicella: MM/DD/YYYY

Recommended Immunizations for today, 7/5/2021 (22Y 6M 4D)




Vaccine
MMR


**Select Action**

- Add Vaccines
- Administer Vaccines
- Add History
- Add History via IZ Gateway Hub

# Manual Query – Demo (Screen Shots 2/6)

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

100+

 **SIMPSON, BART M** ID: 1164043 DOB: 01/01/1999 AGE: 22Y 6M 4D GENDER: M

**Jurisdiction to Search**

**Jurisdiction Endpoint \***

MARYLAND PROD - AUTOMATED INTERFACE ▼

MARYLAND PROD - AUTOMATED INTERFACE





PHILLY PRODUCTION - USER INTERFACE

Search

Cancel

# Manual Query – Demo (Screen Shots 3/6)

## More than one patient match

 **SIMPSON, BART M** ID: 498167 DOB: 01/01/1999 AGE: 18Y 3M 24D GENDER: M    Allergy / Risks ARE specified

**Jurisdiction to Search**

Jurisdiction Endpoint  
TITAN\WEBIZ\_ONC\_PROJECT\_DHSS\_VCURRENT\_KSNOW\_TESTING ▼


Cancel

**Search Results - 2 record(s)**

Name	Phone	Gender	DOB	
SIMPSON, BART M		M	01/01/1999	<a href="#">View</a>
SIMPSON, BART M		M	01/01/1999	<a href="#">View</a>

T ? H

**Patient Preview** X

 **SIMPSON, BART M**

Jurisdiction State Registry ID: 778412  
DOB: 01/01/1999 Gender: M

Home Phone: {REDACTED}

Mailing Address: {REDACTED}

Mailing Address City: MANHATTAN  
Mailing Address State: KS  
Mailing Address Zip: 66502

# 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)

<input type="checkbox"/>	Vaccination Date	Vaccination
<input type="checkbox"/>	01/01/1999	Hep B, ped/adol (CVX: 08)
<input type="checkbox"/>	01/30/2015	Influenza InjPF Quad (CVX: 150)
<input type="checkbox"/>	01/01/2016	Hep B, ped/adol (CVX: 08)
<input type="checkbox"/>	09/24/2018	HPV4 (Gardasil) (CVX: 62)
<input type="checkbox"/>	09/24/2018	Hep B, adult (CVX: 43)

### Patient Preview



**SIMPSON, BART M**

Jurisdiction Local Registry

ID: 2287847

DOB: 01/01/1999

Gender: M

Home Phone: [REDACTED]

Mother's Maiden

Name: SIMPSON

Mailing Address: [REDACTED]

Mailing Address City: DOVER

Mailing Address State: DE

Mailing Address Zip: 19901

Physical Address: 1011

[REDACTED]

Physical Address City: DOVER

Physical Address State: DE

Physical Address Zip: 19901

# Manual Query – Demo (Screen Shots 5/6)

## Single patient match – Select Immunizations

<input type="checkbox"/>	03/16/2020	Smallpox (CVX: 75)
<input type="checkbox"/>	04/20/2020	Adenovirus, type 7 (CVX: 55)
<input type="checkbox"/>	04/21/2020	BCG (CVX: 19)
<input type="checkbox"/>	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

 **SIMPSON, BART M** ID: 1164043 DOB: 01/01/1999 AGE: 22Y 6M 4D GENDER: M

### Jurisdiction to Search

Jurisdiction Endpoint

PHILLY PRODUCTION - USER INTERFACE ▼

#### 1 Immunization(s) Imported

01/01/1999 - Hep B, ped/adol (CVX: 08)

#### 14 Immunization(s) Excluded

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)

03/05/2020 - Tdap, Adsorbed (CVX: 115)

03/06/2020 - Zoster Live (CVX: 121)

03/06/2020 - Yellow Fever, AF (CVX: 183)

03/06/2020 - Smallpox (CVX: 75)

03/06/2020 - Rabies - IM Diploid (CVX: 175)

03/06/2020 - Rotavirus (Rotarix) (CVX: 119)

03/16/2020 - Smallpox (CVX: 75)

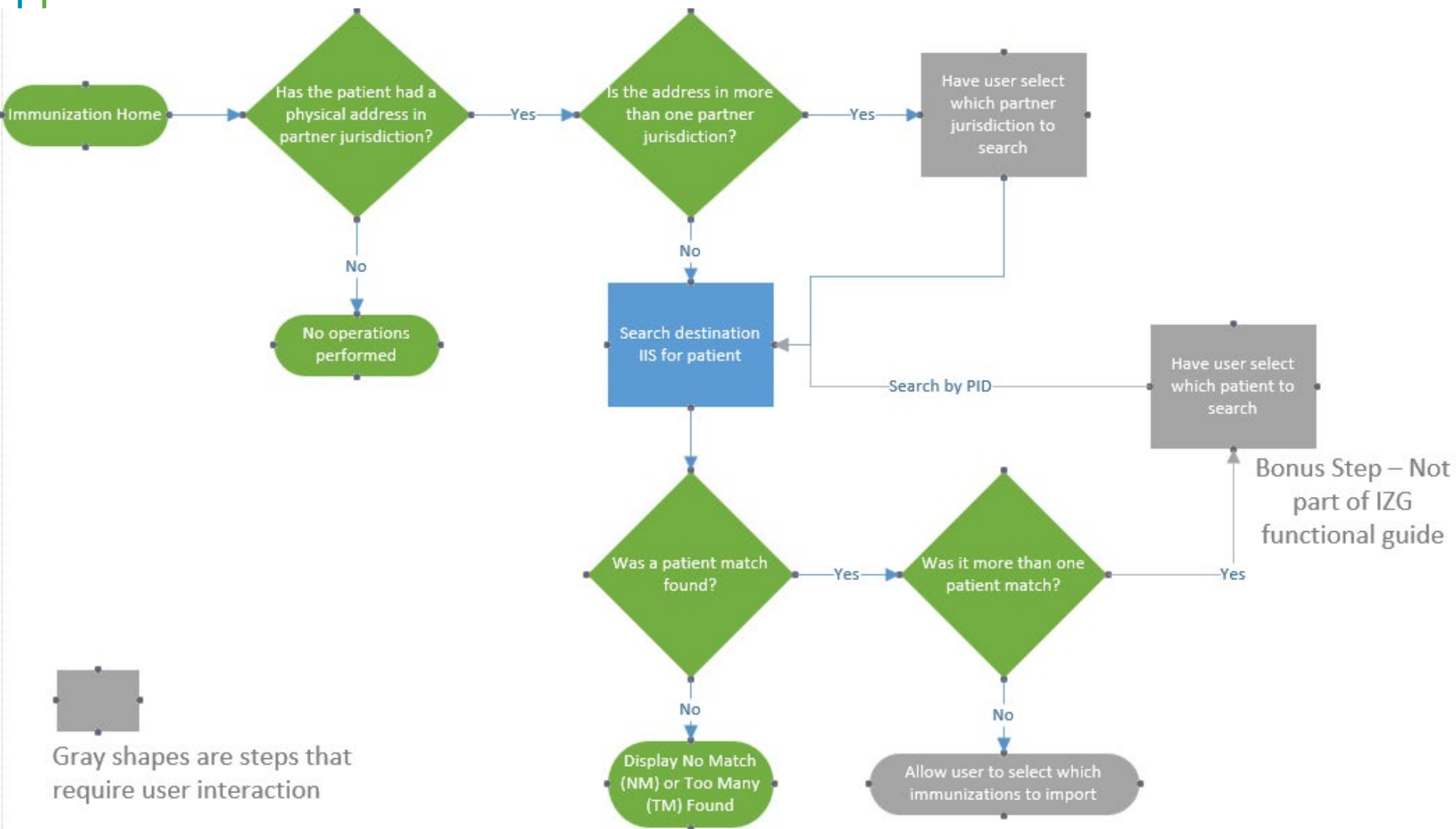
04/20/2020 - Adenovirus, type 7 (CVX: 55)

04/21/2020 - BCG (CVX: 19)

04/21/2020 - Rubella/Mumps (CVX: 38)

[Return To Immunizations](#)

# Manual Query - Flows



# 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

# 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.dhmmh.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

Add Destination Immunization Registry... 

Cancel

Add Destination IIS





Jurisdiction \* 

ALASKA  
AMERICAN SAMOA  
ARKANSAS  
CDPHE  
CNMI  
DISTRICT OF COLUMBIA  
FSM  
GUAM  
HAWAII  
INDIANA  
KANSAS  
MISSOURI  
OHIO  
PALAU  
PUERTO RICO  
RMI  
TENNESSEE  
WASHINGTON  
WYOMING

# 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 

# 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





Home

Patients +

Immunizations

Treatments

Education

IZ Quick Add +

CRA Quick Add +

Inventory +

Clinic Tools +

Program Tools +

Hepatitis B +

Campaigns

Reports/Training

Power BI

Mobile +

Billing +

VTrckS Interface +

Administration +

Outgoing Queue i

## Filter Options

From Date \*

07/06/2021

To Date \*

07/06/2021

Successfully Processed From Date

MM/DD/YYYY

Successfully Processed To Date

MM/DD/YYYY

Patient Id

Message Type

Endpoint

Poison Message

Min Retry Count

Set All Pending Messages To Poison

Set All P

PHILLY PRODUCTION - AUTOMATED INTERFACE  
MARYLAND PROD - AUTOMATED INTERFACE

Filter

Queue Id	Endpoint	Patient Id	Message Type	Retry Count	Poison Message	Successfully Processed Dttm	Comments
57283	MARYLAND PROD - AUTOMATED INTERFACE		VXUV04		FALSE		<span>?</span> <a href="#">VIEW</a>
57282	MARYLAND PROD - AUTOMATED INTERFACE		VXUV04		FALSE		<span>?</span> <a href="#">VIEW</a>
57281	MARYLAND PROD - AUTOMATED INTERFACE		VXUV04		FALSE		<span>?</span> <a href="#">VIEW</a>
57280	MARYLAND PROD - AUTOMATED INTERFACE		VXUV04		FALSE	7/6/2021 4:30:14 PM	<span>?</span> <a href="#">VIEW</a>

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

Queue ID: 57281 ✕

## Outgoing Queue ? i

Update

Endpoint

MARYLAND PROD - AUTOMA

Patient Id

Message Type

VXUV04

Retry Count

Poison Message \*

FALSE ▼

Successfully Processed Date/Time

Comments

No outgoing communications have been made yet

Submit This Message Now

# Logging

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

HL7 Message Log [i Learn More](#)

## Search Criteria

Facility : ALL FACILITIES

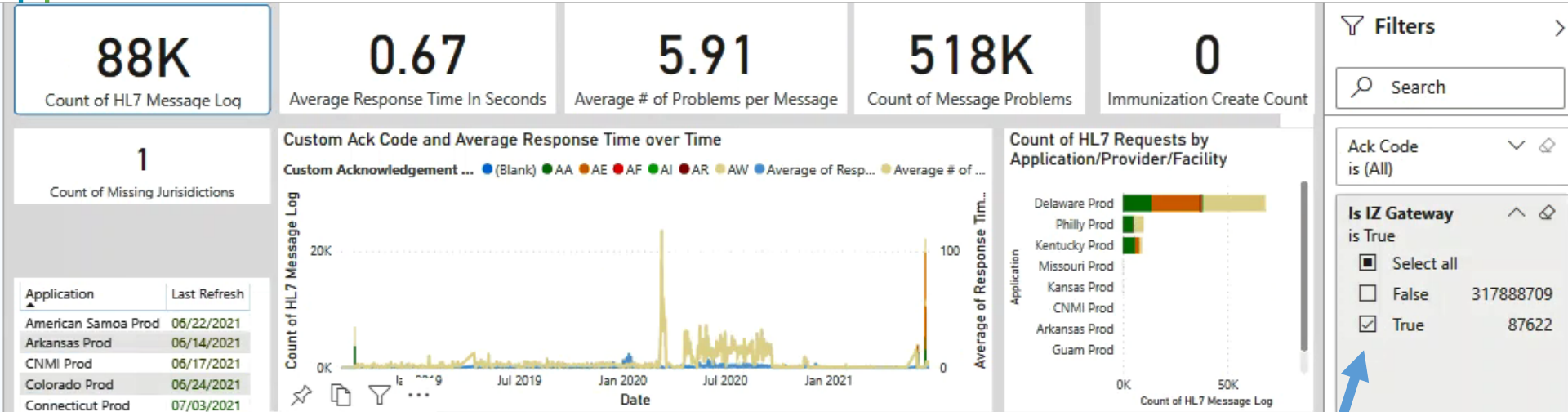
Log ID  Batch Log ID  Patient 🔍✖

Log Type   
-----INCOMING COMMUNICATIONS-----  
INCOMING REQUEST  
OUTGOING RESPONSE  
-----OUTGOING COMMUNICATIONS-----  
OUTGOING REQUEST  
INCOMING RESPONSE  
-----OTHER-----  
ERROR  
RERUN

Message Type  Version   
☐ AA ☐ AE ☐ AR

To Date  To Time  (HH:MM)

# Identify IZ Gateway Traffic



# 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