



# PHC-Hub

## Installation Guide

### (Non-SSO)

v4.17.3



## Support Services

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# Introduction to PHC-Hub

The primary purpose of PHC-Hub (Public Health Connection Hub) is to establish connections (interfaces) to improve public health. PHC-Hub facilitates the integration between healthcare provider systems and Immunization Information Systems (IIS) by managing HL7 message processing. PHC-Hub can be integrated with *either* the IWeb application or WIR IIS.

PHC-Hub receives inbound HL7 messages, extracts and validates the data, translates coded values, and updates the host system's database with patient and immunization data. In addition to supporting the standard inbound unsolicited HL7 message transaction, PHC-Hub also supports a reciprocal batch interface where new patient immunization activity that may be unknown to the provider is returned using the original inbound connection. PHC-Hub supports HL7 inbound query requests for patient immunization history. Both HL7 versions, 2.3.1 and 2.5.1, are supported. PHC-Hub supports quality reporting and extensive customization of the field level message validation process.

PHC-Hub is available as an integration tool for [IWeb](#) and [WIR](#).

PHC-Hub is divided into the following areas:

- Projects - Allows immunization registry staff and other connecting entities to organize and track interface progress.
- Test - Allows vendors and EHR users to test HL7 messages in a controlled environment.
- Imports - Controls how data for each interface is translated and verified before being accepted into the immunization registry, as well as controls incoming queries.
- Exports - Controls how and when data is exported from the immunization registry.
- Reports - Enables the immunization registry staff and EHR users to run and/or schedule reports to aid in monitoring the data imported and the data quality.

## Supported Platforms

The supported platforms for PHC-Hub are as follows:

What	Supported	Notes
Number of instances	Single	
Java server platform	1.8	Java 1.8 is supported as of the January 2017 release.

What	Supported	Notes
Operating systems	<ul style="list-style-type: none"> <li>Linux</li> <li>Microsoft Windows</li> </ul>	
Minimum RAM	16G+	RAM requirements can vary based on the size of the state, the amount of traffic into the application, and the number of reports run simultaneously.
Minimum disc size	1 TB	
Minimum processor	2 Quad Core 64-bit processors	
Application server	Tomcat 7	
Database	Oracle 12c	
Web browser	Internet Explorer 11	As of January 2016, Internet Explorer 8, 9, and 10 are no longer supported.

*Additional resources:*

- [CDC HL7 Version 2.5.1 Implementation Guide for Immunization Messaging](#)
- [CDC IIS Functional Standards Website](#)
- [HTTPS POST Specification](#)
- [American Immunization Registry Association](#)
- [STC Implementation Guide for HL7 2.5.1](#) (XLSX file)

# PHC-Hub and IWeb Integration

IWeb is an application that provides immunization resource management and administration tools to track patient vaccination status. IWeb helps public health agencies and vaccine providers make informed decisions that improve the health of entire communities, especially children. IWeb is used by public health officials, public health employees, and private providers to enable:

- Vaccinators to view a child's complete vaccination record, thus preventing over- and under-vaccination.
- Health officials to measure and improve vaccination rates by providing a "big picture" perspective through various reports.
- Health officials to send mailings and remind parents of needed vaccinations.
- School nurses to review student vaccination records.

PHC-Hub is directly integrated into IWeb and provides a user interface, while IWeb defines and manages the business logic. PHC-Hub manages the external HL7 interfaces and ensures that all incoming data passes strict data quality checks before it's sent to IWeb for processing. PHC-Hub has several functions that can help administrative users, such as:

- Electronic Health Records (EHR) vendor testing tools to view and test HL7 messages.
- A profile manager to allow configuration on a per-interface basis.
- A data mapping feature to map incoming codes to the correct HL7 values.
- A system that can be customized to watch for specific data quality levels expected for each interface.
- Processing and data quality reports and logs to help in interface management and troubleshooting.

## Public and Private Data

To ensure privacy, IWeb differentiates between public and private data. Changes to public data are visible to all IWeb users while changes to private data are only visible to users in the same organization. An organization can be a single clinic or several clinics that work under a single owning entity.

IWeb also tracks the patient's medical provider by assigning the last facility to update a patient's record as the current owner of the record. Patient ownership primarily impacts IWeb vaccination reports.



# Patient Identification and Matching

IWeb uses two IDs to identify patients: its own internal SIIS ID and the externally defined medical record number (i.e., chart number or patient ID), which must be unique to an organization. A patient in IWeb has one SIIS ID and one or more medical record numbers, one for each organization the patient has an association with. If no medical record number is defined, it defaults to the *SIISCLIENT+SIIS* ID.

## Deduplication

IWeb uses deduplication to identify and merge duplicate patient records. This results in one of three actions:

- If there is a good match for exactly one patient record in the registry, the two records are automatically merged together
- If there is not a good match for any patient records in the registry, it is automatically added as a new patient record
- If there is a possible match with one or more patient records, the records must be reviewed before they can be merged

Most administrators run deduplication nightly which means that updates are not visible in IWeb until the next day. In addition, records marked for manual review by IWeb administrators are not available until they are reviewed, which may take several days. PHC-Hub has responsibility for the message, but doesn't indicate that the message has been processed and merged into IWeb.

PHC-Hub can request automatic deduplication on certain incoming HL7 messages, so that IWeb users don't have to wait to see imported patient information. This has some limitations, such as:

- Most patients are accepted immediately, but some still have to be manually reviewed to determine a proper registry match. Depending on the registry deduplication work queue, this may take several days. The sending systems can reduce the number of records that are affected by ensuring that complete patient records are sent. The more complete a patient record's demographics are, the more likely it is to be confidently matched to other records.
- IWeb runs the primary deduplication process every night which may take several hours. Automatic deduplication requests that are sent during off hours are queued to run after the nightly process. This delay is particularly noticeable after IWeb upgrades when the nightly process runs for long periods of time (sometimes all night) to apply new changes to patient records.

# IWeb User Role Access and Permissions

There are two basic permission checks that are performed in PHC-Hub:

- A login source check determines whether you can access the application the way you are trying to (HL7 Realtime, IWeb, Linkover, Webservice, or Web Interface).

For example, a Facility Client with Upload HL7 access can submit HL7 messages via the Realtime Interface, but cannot log in using the Web Interface. Conversely, a Registry Client user may log in using the Web Interface, but cannot submit message through the HL7 Realtime Server unless they are granted that permission in IWeb.

- A second check determines the user's allowed modes or roles which drive the rest of the behavior primarily for users that logged in via the Web Interface and IWeb Linkover. This check happens via a central mechanism in `Permisison.java` due to each page identifying itself as having a "PermissionId" with "Permission objects" constructed to grant access to IDs based on an array of modes.

For example, an Organization Client user may log in through the Web Interface, but cannot create new import profiles or administer the application because they don't have the Admin role. A Registry Client user can log in through the Web Interface, administer the application settings, and create import/export profiles, but cannot access the Interface Status Manager unless they are granted the Project Tracker permission in IWeb.

The following defines the interaction between IWeb user roles and PHC-Hub permissions:

- **Login** - User can log in to the PHC-Hub user interface (UI).
- **Admin** - User can modify application and profile settings and perform other administrative tasks.
- **Projects** - User can access PHC-Hub Project Tracker functionality.
- **Import** - User can submit HL7 updates (VXU's).
- **Test** - User can access PHC-Hub's HL7 testing/troubleshooting tools.
- **Review** - User can review incoming messages and their associated validation results.
- **WS Export** - User can access PHC-Hub's patient demographic export web service.

Access Level	Login <sup>1</sup>	Admin <sup>2</sup>	Projects <sup>3</sup>	Import <sup>4</sup>	Test	Review	WS Export <sup>5</sup>
Registry Client	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Registry View	Yes	No	No	No	Yes	Yes	Yes
Organization Client	Yes	No	No	Yes	Yes	Yes	No
Organization View	Yes	No	No	No	Yes	Yes	No

Access Level	Login <sup>1</sup>	Admin <sup>2</sup>	Projects <sup>3</sup>	Import <sup>4</sup>	Test	Review	WS Export <sup>5</sup>
Facility Client>	Yes	No	No	Yes	Yes	Yes	No
Facility View	Yes	No	No	No	Yes	Yes	No
No Login	No	No	No	Yes	No	No	Yes

<sup>1</sup>Requires "PHC-Hub Access" permission.

<sup>2</sup>Requires "System Administrator" permission.

<sup>3</sup>Requires "Project Tracker Access" permission.

<sup>4</sup>Requires "Upload HL7 Access" permission.

<sup>5</sup>Requires "PHC-Hub Run Web Service Export" permission.

<sup>6</sup>Review access is limited to the data/reports appropriate to the access level and the providers the logged in user is associated with.

# PHC-Hub and WIR Integration

PHC-Hub integrates with the Wisconsin Immunization Registry (WIR) Immunization Information System (IIS) to manage HL7 messages. When HL7 messages are received and validated, the patient and immunization content is stored in a set of staging tables in the WIR database. The WIR HL7 interface daemon (called ADIM) continuously polls the staging tables for new activity and processes, runs deduplication, and merges the incoming data into the existing IIS patient population.

PHC-Hub references the WIR database to perform field level validation and translation on coded fields from inbound HL7 messages. Inbound HL7 query requests search the WIR database for qualifying patients and immunization data to include in the response. Users, organizations, and facilities are all defined in the WIR IIS for use in PHC-Hub.

## WIR User Role Access and Permissions

PHC-Hub limits access to various features by showing/hiding their associated menu items. Non-menu based functionality, like inbound HL7 message authentication, is also supported. Each feature is associated with one of the following modes:

- **PROFILE\_ADMINISTRATOR\_MODE** - Read/Write access to import/export profiles.
- **SYSTEM\_ADMINISTRATOR\_MODE** - Read/Write access to application settings.
- **IMPORT\_MODE** - User may have access. Coupled with EXPORT\_MODE.

The logic to verify that the user is associated with a single organization only happens if the role the user is associated with contains IMPORT\_MODE.

- **EXPORT\_MODE** - User may have access. Coupled with IMPORT\_MODE.
- **PROJECTS\_MODE** - Enables project tracker.
- **TEST\_MODE** - All users have access.
- **GENERAL\_MODE** - All users have access.
- **REVIEW\_MODE** - All users have read-only access to import profiles and errors.

WIR Role	PHC-Hub Mode
PHC_HUB ORG LEVEL PERMISSION	<ul style="list-style-type: none"><li>• GENERAL_MODE</li><li>• TEST_MODE</li><li>• REVIEW_MODE</li></ul>
PHC-HUB REGISTRY LEVEL PERMISSION	<ul style="list-style-type: none"><li>• GENERAL_MODE</li><li>• TEST_MODE</li><li>• REVIEW_MODE</li><li>• PROFILE_ADMINISTRATOR_MODE</li></ul>

WIR Role	PHC-Hub Mode
PHC-HUB SITE LEVEL PERMISSION	<ul style="list-style-type: none"> <li>GENERAL_MODE</li> <li>TEST_MODE</li> <li>REVIEW_MODE</li> </ul>
PHC-HUB REGISTRY & PROJECT_TRACKER_ACCESS	<ul style="list-style-type: none"> <li>PROJECTS_MODE</li> </ul>
PHC-HUB UPLOAD_HL7_ACCESS PERMISSION	<ul style="list-style-type: none"> <li>IMPORT_MODE</li> <li>EXPORT_MODE</li> </ul>
PHC-HUB ADMINISTRATOR PERMISSION	<ul style="list-style-type: none"> <li>SYSTEM_ADMINISTRATOR_MODE</li> </ul>
PHC-HUB REG_AND_UPLOAD	<ul style="list-style-type: none"> <li>GENERAL_MODE</li> <li>TEST_MODE</li> <li>REVIEW_MODE</li> <li>PROFILE_ADMINISTRATOR_MODE</li> <li>IMPORT_MODE</li> <li>EXPORT_MODE</li> </ul>
PHC-HUB ALL_IN_ONE	<ul style="list-style-type: none"> <li>GENERAL_MODE</li> <li>TEST_MODE</li> <li>REVIEW_MODE</li> <li>PROFILE_ADMINISTRATOR_MODE</li> <li>IMPORT_MODE</li> <li>EXPORT_MODE</li> <li>PROJECTS_MODE</li> <li>SYSTEM_ADMINISTRATOR_MODE</li> </ul>

## Roles Associated with IMPORT\_MODE

When an HL7 message is received by the PHC-Hub inbound interface servlet, the application must first authenticate that the message came from a valid source and then must determine which profile to associate the message to. Each message is sent with a username and password in the HTTP transaction. PHC-Hub looks to see what imMTrax organization the user is associated with and then knows what profile to use. For this strategy to work, users that are assigned to inbound HL7 interfaces must be associated with a single organization in imMTrax. If this is not the case, the message is rejected.

## WIR Reciprocal Batch Processing

Reciprocal batch works in conjunction with the inbound unsolicited HL7 interface in PHC-Hub. Its purpose is to identify, format, and send HL7 messages for new patient immunization activity back to the provider's system over the same HTTPS connection used to receive incoming messages.

One requirement for WIR reciprocal batch processing is to maintain a separate set of demographics representing the data received from the provider's system. When HL7

messages are formatted for return to the provider, the demographics from received messages are used instead of demographics from WIR. When the inbound interface profile is linked to an export profile via the "Reciprocal Update" parameter, then all inbound demographics are saved to a separate table in WIR as part of inbound processing. If the export profile parameter "Send name, general DOB from reserve record" is checked, then all outbound HL7 messages use the saved demographics instead of the patient demographics maintained in WIR.

The reciprocal batch process can be triggered on demand or scheduled. The on demand function requires a start and stop date. A scheduled process identifies new activity that has occurred since the last scheduled run. Only patients with a relationship to the organization associated with the export profile are considered for the reciprocal batch. If the "last\_updated\_date" value associated with the immunization is later than the date/time of the previous reciprocal batch run, then that immunization is included.

# Install PHC-Hub with the IIS

PHC-Hub uses Apache Tomcat or WebLogic to connect with the IIS.

## Tomcat Installation Tasks

To connect PHC-Hub and the IIS using Apache Tomcat, you must:

1. Install the PHC-Hub database and web application for Tomcat - see [Install PHC-Hub - Tomcat](#).
2. Edit the configuration file in the web application - see [Edit the Configuration File](#).
3. Configure IWeb-PHC-Hub links (IWeb installations only) - see [Configure Links](#).
4. Configure the application settings - see [Configure Application Settings](#).
5. (Optional) Hide the application settings - see [Hide Application Settings](#).

## WebLogic Installation Tasks

To connect PHC-Hub and the IIS using WebLogic you must:

1. Install and update the PHC-Hub database for WebLogic - see [Weblogic Database Installation](#).
2. Install the PHC-Hub web application - see [Install the WebLogic Web Application](#).
3. Deploy a new PHC-Hub .war file - see [Deploy a New phchub.war File](#).
4. Edit the web application configuration file - see [Edit the Configuration File](#).
5. Configure the application settings - see [Configure Application Settings](#).
6. (Optional) Hide the application settings - see [Hide Application Settings](#).

## Install PHC-Hub - Tomcat

To install PHC-Hub with Tomcat, you must install the database and web application.

**NOTE:** The cpweb user is originally installed with DBA privileges and a default tablespace of CP\_WEB. All objects are stored in the cpweb user schema that is specifically part of the PHC-Hub functionality. The cpweb user may access that schema with DBA privileges. If you've modified these, please ensure the cpweb user has DBA privileges and access to any modified tablespaces which may be needed to run this installation.

## Install PHC-Hub Database

1. If an Oracle database does not already exist, create one before proceeding with the PHC-Hub installation.

This can be the IWeb database, but a separate database for production is strongly recommended.

2. Modify the `install.bat` file found in the `Install` directory.
  - If the SYSTEM password set during database creation is different from the password in the `install.bat` file, modify the `install.bat` file to match the Oracle password you created. This applies to all lines that contain the system login information (SYSTEM/MANAGER@[CPWEB]).
  - If you edited the cpweb login in the `createUser.sql` file, you must also change the password in the `update.bat` file where the cpweb user is used.
  - Edit the `install.bat` file to change the database name from [CPWEB] to the name of your database. Make sure you remove the brackets.
  - If there's an existing database for PHC-Hub, modify the `install.bat` file so the existing database is not overwritten. The call in `install.bat` to `createUser.sql` passes parameters to that file to create the initial database files and tablespaces.
  - The following is an example of the first line in the batch file. The first three command lines must use the SYSTEM login credentials. Optionally, you can modify the file names passed to names you choose yourself. These are the database file name (CPWEB\_IHUB.DBF) and the temp file name (CPWEB\_IHUB\_TEMP.DBF) that are created to hold your database.

Current Statement	Modified Statement
sqlplus SYSTEM/MANAGER@[CPWEB] @createUser.sql CPWEB_IHUB.DBF CPWEB_IHUB_TEMP.DBF	sqlplus SYSTEM/yourSystemPW@yourPHCHUB @createUser.sql CPWEB_IHUB.DBF CPWEB_IHUB_TEMP.DBF

- The following is an example of the last line in the install file. For this line you must use the credentials of the PHC-Hub schema owner.

Current Statement	Modified Statement
sqlplus cpweb/cpweb@[CPWEB] @finish_install.sql	sqlplus cpweb/cpweb@yourPHCHUB @finish_install.sql

3. Modify the user names and passwords for application access to the PHC-Hub and IWeb databases by changing the credentials in the `[application root]\web\WEB-INF\classes\db.properties` file.



- Set the values for cp.user and cp.password to match the values used in the securityUpdate.sql file. The default values are cpuser for the user ID and cpadmin for the password.
- Set the values for siis.user and siis.password to match the values used by the IWeb system. The default values are pci for the user ID and admin for the password.

DO NOT use the H33ASIIS user ID and password. This user has DBA privileges and should not be used for general system access.

4. After the installation completes, you can run the following statement in SQLPlus to view the database version. Log in to SQLPlus as the cpweb user.

```
SQL> set linesize 120;
SQL> select * from CP_SW_VERSION order by insert_stamp;
```

5. To update your installation to the latest version, install the latest patch. Details can be found in the Patches\patch\_v411\patch\_notes.txt file.

## Install PHC-Hub Web Application

1. Ensure an Oracle ojdbc driver is available to your servlet container environment classpath. For example, tomcat-install-directory/lib/ojdbc6.jar.
2. Deploy the .war file to the webapps directory in your Tomcat installation.
3. Edit the db.properties file (located in webapps/PHC-Hub/WEB-INF/) classes according to your database configuration.

To continue the installation, see [Edit the Configuration File](#).

## WebLogic Database Installation

To install PHC-Hub with WebLogic, you must install and update the database, install the web application, and deploy a new phchub.war file.

### Install PHC-Hub Database

1. Navigate to the <phc-hub project>/db/Install directory.
2. Open the install.bat file.
3. Modify the database SID to reference your database SID. The following example assumes a new database named PHCHUB with an initial password of MANAGER.

Current Statement	Modified Statement
sqlplus SYSTEM/MANAGER@[CPWEB] @createUser.sql CPWEB_IHUB.DBF CPWEB_IHUB_TEMP.DBF	sqlplus SYSTEM/MANAGER@PHCHUB @createUser.sql CPWEB_IHUB.DBF CPWEB_IHUB_TEMP.DBF

## Update PHC-Hub Database

1. After installing the PHC-Hub database, navigate to <phc-hub project>/Patches/patch\_v4.
2. Open the patch.bat file.
3. Modify the SID to reference your database SID. The following example assumes a new database named PHCHUB:

Current Statement	Modified Statement
sqlplus cpweb/cpweb@[CPWEB] @patch41110.sql	sqlplus cpweb/cpweb@PHCHUB @patch41110.sql

4. Change all [CPWEB] references to PHCHUB.
5. Run the patch.bat file.
6. After the update completes, log in to sqlplus as the cpwebuser and run the following statement to view the database version.

```
SQL> set linesize 120;  
SQL> select * from CP_SW VERSION order by insert_stamp;
```

## Install the WebLogic Web Application

To install PHC-Hub with WebLogic, you must create the datasource on the server and disable wrapping for each JDBC datasource.

**NOTE:** Log on to the WebLogic console with user credentials:  
<http://<hostname>:7001/console/>

## Create the Datasource in WebLogic Server

1. In the WebLogic Administration Console, click the **Lock & Edit** button.
2. Click **Services > Data Sources**.
3. Click **New** to create a new JNDI datasource > **Generic Data Source**.
4. Set up a JNDI datasource named **jdbc/wirDB** with the following details:
  - a. **Name:** <enter any relevant name>
  - b. **JNDI Name:** jdbc/wirDB
  - c. **Database Type:** Oracle
5. Click **Next**.

6. Select the default database driver > **Next**.
7. Type the database name, server name, port (1521), username, and password.
8. Once the datasource is created, click **Targets**.
9. Select the **Admin Server** option.
10. Click **Activate Changes**.
11. Repeat the steps 4-10 to create a JNDI datasource named for **jdbc/cpwebDB**.

## Disable Wrapping for JDBC Datasources

1. If necessary in the WebLogic Administration Console, click **Lock & Edit**.
2. In the Domain Structure tree, expand **Services**, and then click **Data Sources**.
3. On the Summary of Data Sources page, select the datasource name. For example, jdbc/wirDB.
4. Click the Configuration: **Connection Pool** tab.
5. Click **Advanced**.
6. Clear the **Wrap Data Types** option to disable wrapping.
7. Click **Save**.
8. Click **Activate Changes**.
9. Restart the server to apply changes.

## Deploy a New phchub.war File

When installing PHC-Hub on WebLogic, you must deploy a new phchub.war file on the WebLogic server:

1. In the WebLogic Administration Console, click **Lock & Edit**.
2. Click **Deployments > Install**.
3. In the **Path** field, enter the location of the phchub.war file.
4. Click **Next**.
5. Leave the default options and click **Finish**.
6. Select **phchub > Start > Servicing all requests**.
7. Select **phchub > Activate all changes**.

## Access the PHC-Hub Application

1. Log in to the Oracle Fusion Middleware Control: `http://<hostname>:7001/em/`
2. Expand **Application Deployments** > **Internal Applications** > select **phchub**.
3. In **Entry Points** > **Web modules** you can access the URL for phchub:  
`http://<hostname>:7001/phchub/`

## Edit the Configuration File in the Web Application

In the Web application, edit `web/WEB-INF/classes/db.properties`. The user and password parameters may be case-sensitive.

### IWeb Configuration File

1. For the line that starts with `siis.url`:
  - Set HOST to your machine name/IP address/localhost (if the database is on the same machine where Tomcat is running).
  - Set SID to the SID for your SIIS databases.
2. The `cp.url` is the same if you're installing CP tables in the SIIS database. Otherwise, change the value appropriately for the new CP database.
3. The `siis.user` is the user ID that IWeb uses to access SIIS (usually `pci`).
4. The `cp.user` is the same as the `siis.user` if the CP tables are in the SIIS database. Otherwise, change according to the `createUser.sql` script (usually `cpuser`) or local definition.
5. The `siis password` is the password that IWeb uses to access SIIS (usually `admin`).
6. The `cp.password` is the same as the `siis.password` if the CP tables are in the SIIS database. Otherwise, change it according to `createUser.sql` script (usually `cpadmin`) or local definition.

### WIR Configuration File

1. For the line that starts with `wir.url`:
  - Set HOST to be your machine name/IP address/localhost (if the database is on the same machine where WebLogic is running).
  - Set SID to be the SID for your WIR database.

2. The `cp.url` is the same if you're installing CP tables in the WIR database. Otherwise, change the value appropriately for the new CP database.
3. The `wir.user` is the user ID that WIR uses to access the database (usually `wir_owner`).
4. Change according to the `createUser.sql` script (usually `cpuser`) or local definition.
5. The `wir.password` is the password that WIR uses to access the database (usually `wo42wo`).
6. The `cp.password` is the same as the `wir.password` if the CP tables are in the database. Otherwise, change according to the `createUser.sql` script (usually `cpuser`) or local definition.

## Configure PHC-Hub and IWeb Links

For IWeb installations, you must configure a link from IWeb to PHC-Hub and from PHC-Hub to IWeb.

### Link IWeb to PHC-Hub

1. Log in to IWeb as a user who has the Registry Settings permission.
2. Navigate to **Administration > Properties > Registry Settings**.
3. Set the **Project Tracker Root URL** to the *externally* accessible URL at the IWeb root. This is the URL that is accessible to users connecting from the internet.

### Link PHC-Hub to IWeb

1. Log in to PHC-Hub as a Registry Client user.
2. From the **Main** menu, click **App Settings**.
3. In the **Registry Base URL** field, set the *internally* accessible URL to the IWeb root. This is the URL that is accessible from the PHC-Hub application server.

## Configure Application Settings

Application settings define the PHC-Hub configuration and must be set up prior to using the application.

1. From the **Main** menu, click **App Settings**.
2. Define the application setting using the following fields:

Field	Description
-------	-------------

Field	Description
<b>Upload Directory</b>	Enter a location on the local drive where manually uploaded files are saved until they are processed. When the user uploads a file it is saved here, processed, and then deleted.
<b>Google Map API Key</b>	Enter the map API key obtained from Google to enable contact mapping. When a geocode is defined, you can see a map of where a contact is located in the contact record.
<b>From Email Address</b>	Enter a From email address to use when sending detailed debug messages. Required for scheduled reports to run and email.
<b>From Email Friendly Name</b>	Enter a user friendly email name that identifies who the debug email messages are from.
<b>Email Subject Line Prefix</b>	Enter a message to use in the email subject line. The subject begins with this text.
<b>SMTP Server URL</b>	Enter the URL to the SMTP server used to send email. Required for scheduled reports to run and email.
<b>SMTP Server Port</b>	Enter the port number of the SMTP server.
<b>SMTP Username</b>	Enter a username if password based authentication is used when communicating with the SMTP server.
<b>SMTP Password</b>	Enter the password for the SMTP username. This setting is ignored when the Username is blank.
<b>SMTP Use Secure Connection</b>	Select to force SMTP to use a secure connection.
<b>Bogus Names</b>	Enter the name(s) that are considered invalid for all import interfaces. How the invalid names are handled is import profile specific.
<b>Flag Incoming Messages as PreProduction</b>	Select to enable all incoming HL7 messages to be flagged as pre-production. Enabling this setting overrides the setting of the same name in all import profiles. Disabling this setting returns the import profiles to their original state.
<b>Ignore Imports for Overaged Patients</b>	Select to ignore patients over a specific age. Then, set the patient age in the "Starting Age for Ignore" field.
<b>Starting Age for Ignore</b>	Enter an age (in years). Patients this age or older are not imported when the "Ignore Imports for Overaged Patients" field is enabled.
<b>Daily Export Time (24 hour format)</b>	Enter the time of day when daily exports are scheduled to start.
<b>Login Max Retries</b>	Enter the number of times a user can attempt to login before the account is locked. This value is independent of the value set in IWeb, but is only active for IWeb integration. The value is maintained in WIR for WIR integration.
<b>Login Lockout Duration in Minutes</b>	Enter the amount of time the user can attempt a login before the account is locked. This value is independent of the value

Field	Description
	set in IWeb, but is only active for IWeb integration. The value is maintained in WIR for WIR integration.
<b>Registry Base URL</b>	Enter the internal URL of the IIS from the PHC-Hub server. The URL is required to enable certain functions in IWeb and WIR integration.
<b>PHC-Hub Internal Base URL</b>	Enter the fully qualified URL, including context path, that is accessible from the server that PHC-Hub is running on. For example, http://192.168.56.1:8080/phchub. Required for scheduled reports to run and email.
<b>PHC-Hub External Base URL</b>	Enter the fully qualified URL, including context path, that users type into their browsers to access PHC-Hub. For example, http://192.168.56.1:8080/phchub. This setting is currently used by the web services to set the soap address location attribute. Normally the location is configured automatically by the incoming HTTP request, but that can fail when a proxy server (usually IIS or Apache) is running between the user and the servlet container (Tomcat or Weblogic). If the WSDL normally gives an invalid location, use this setting to override it.
<b>PHC-Hub External Base URL for ONC</b>	(IWeb only) Enter the value used by the web service WSDL files to create the "location" value. This setting is necessary when there is a proxy server in front of Tomcat (like IIS or Apache) that makes the WSDL show up with an internal-only network address. For example, http://10.0.3.77:8080 instead of http://epicenter.stchome.com. Entering a value here overrides auto-detection.
<b>Email Text</b>	Enter the default text used in the email body.
<b>Enable Trusted network IP Address</b>	Select to enable the Network IP address as a trusted source.
<b>Trusted network IP address</b>	Enter the network IP address for your trusted network IP address.
<b>Interop Portal Messaging Base URL</b>	Enter the URL to the Interoperability Portal queuing system. Use the format: Host:Port
<b>Interop Portal Messaging Username</b>	Enter the username used to log on to the Interoperability Portal queuing system.
<b>Interop Portal Messaging Password</b>	Enter the password for the username used to log on to the Interoperability Portal queuing system.
<b>Interop Portal Messaging Queue</b>	Enter the queue name of the Interoperability Portal queuing system.
<b>PHC-Hub FTP Root Directory</b>	This is the root folder under which folders are created for each provider, for users to use for uploading the files via the FTP server.

3. Click **Save**.

4. Restart the application for the changes to take effect.

## Hide Application Settings

You can use a database key to hide the Application Settings page for all users. When the page is hidden, application settings are changed using a database update statement by someone with direct access to the CPWEB database.

1. Navigate to the cp\_keys table in the CPWEB database.
2. Set the **Applications Settings Display** option to one of the following:
  - **Y** - Show the App Settings page in PHC-Hub.
  - **null** - Hide the App Settings page in PHC-Hub.
3. Execute the following in SQLPlus to hide the App Settings page:

```
UPDATE CP_KEYS CK SET CK.VALUE=NULL WHERE CK.ID='APPLICATION' AND  
CK.KEY='application.settings.display';commit;
```

4. Restart Tomcat or WebLogic to update changes in PHC-Hub.



# Interface Specifications

The following sections provide additional information on PHC-Hub interfaces:

- [Message Transport Methods](#)
- [Message Format](#)
- [VFC and Lot Tracking](#)
- [HL7 Gateway](#)

## HL7 Message Transport Methods

PHC-Hub supports several methods for transferring HL7 data. All methods move data with the same results. However, immunization registry or network policy may limit the methods you can use. Please discuss which methods you have available with your immunization registry program.

PHC-Hub supports the following transport methods:

- [HTTP Upload](#)
- [HTTP POST](#)
- [CDC WSDL](#)
- [TCP/IP](#)
- [Local File](#)
- [FTP Server](#)

### HTTP Upload Message Transfers

PHC-Hub allows users to log in and upload a data file using their browser. This type of HL7 message transfer is useful during testing and initial data loads. However, because this is not an automated process it's not preferred for regular data submission.

For detailed data file upload steps, see "Upload a batch File" in the PHC-Hub User Guide.

### HTTP POST Message Transfers

PHC-Hub receives HL7 messages using a protocol defined in the document titled "Transport of Immunization HL7 Transaction over the Internet Using Secure HTTP version 1.0" written by the HL7 Immunization Registry Task Force (Rockmore, Yeatts, and Davidson). It describes sending an HL7 message, a username, a password, and a facility ID in an HTTP POST transaction and receiving an HL7 message as a response.

For an external system to connect to the immunization registry it must have two features:

- A connection to the internet so that it can "see" the registry's web interface
- The ability to send HL7 immunization messages using HTTPS

## **Request Encoding**

When the sending application sends PHC-Hub an HL7 message via an HTTPS POST command, it must have the following fields:

- **USERID** - Assigned by the PHC-Hub administrator.
- **PASSWORD** - Assigned by the PHC-Hub administrator.
- **MESSAGEDATA** - The HL7 messages.

HL7 messages may be one at a time (one for every HTTPS request) or grouped in a batch. Batch messages do not have any special separators or wrappers, but the standard HL7 batch protocol may be used. The batch is formatted as follows:

```
[FHS] { [BHS] { [MSH] ... } [BTS] } [FTS]
```

## **Response Encoding**

PHC-Hub returns responses to the sending system. Requests with multiple messages can have multiple responses, one for each request message. Responses are returned as defined in the account configuration. The available options are:

- **Always** - Always send a response for a message.
- **Never** - Never send a response for a message.
- **On Error** - Send responses only for those messages that have errors and are not accepted.
- **Determined by Message** - Use the incoming message's MSH segment to determine the response option (Always, Never, or Only on Error).

Responses from the HL7 interface are always in HL7 format. HL7 responses can indicate any one of the following things:

- **Authentication error** - The HL7 user making the request is not allowed to because username and password are incorrect or account does not have permission to accept HL7 messages.
- **Message parsing error** - The HL7 parser is unable to read the incoming message because it doesn't conform to HL7 standards.
- **Message content error** - PHC-Hub cannot accept the data because of missing or incorrect information.

- **Message processing exception** - PHC-Hub cannot process the message because of an unexpected problem.
- **Message accepted** - PHC-Hub has accepted the data and is either holding it for review or submitting it to the IIS for processing.
- **Response to query** - The IIS responds to the query with query results.

## CDC WSDL

The standard interface defines the contract between the trading partners ([Sender and Receiver](#)). SOAP (Simple Object Access Protocol) web services use a Web Services Definition Language (WSDL) to achieve this. The WSDL for the SOAP web service is used as the contract between the sender and the receiver to pass the HL7 message as a string of data.

The WSDL tells a program that knows about SOAP exactly how to use the web service. If a tool is available that understands SOAP web services, the following URLs are all that is needed to set up the web service. Please review the EHR documentation to determine all steps in setting up the web service.

The CDC WSDL URL is: <http://www.cdc.gov/vaccines/programs/iis/technical-guidance/SOAP/wsdl.html>

## TCP/IP Message Transfers

PHC-Hub supports an incoming TCP/IP connection for HL7 message transfers that support the Minimum Lower Level Protocol defined by HL7. However, this interface is not secure and is normally not available beyond the local network where PHC-Hub is located. If needed, PHC-Hub can be configured to listen for incoming data on one or more ports.

## Local File Message Transfers

PHC-Hub supports polling a local directory for files to upload that contain HL7 messages. This functionality is only useful to the PHC-Hub operators as it can only examine directories on the PHC-Hub server. This transfer type cannot be used to read files from remote systems such as those located at immunization provider practices.

You can test the local file message transfer by entering the following data into the Realtime Interface test form (**Import Profiles > Realtime Interface**):

- **USERID** - The HL7 account username.
- **PASSWORD** - The HL7 account password.
- **FACILITY** - Leave this field blank.
- **MESSAGEDATA** - The HL7 message. Replace any test data that is already there.

## FTP Server

Using the FTP mapping page, the Registry client user can configure options for each organization so that HL7 messages sent via secure FTP are received by PHC-Hub and are processed under the configuration settings (**Main > FTP Mapping**).

# PHC-Hub HL7 Message Format

PHC-Hub is built to accept messages in HL7 version 2 format. It also supports alternate formats that follow the structure and business rules of immunization HL7 messages. PHC-Hub translates data from the message into an internal data structure that is modeled after the HL7 messages. Data from other formats, such as flat-file, is translated to the internal data representation. Further processing on the data is performed on the internal model and is not HL7 specific.

For older versions of GE Centricity that don't support standard immunization messages, some additional configuration is required (see [Workaround for GE Centricity](#)).

## Messages Accepted

PHC-Hub accepts the following HL7 messages:

Message	Description
<b>VXU</b>	Patient Vaccination Record Unsolicited.
<b>VXQ or QBP</b>	Query for Patient Vaccination/Immunization History Record. Uses the data in QRF-5 to match records.
<b>DFT^P03</b>	Post Detail Financial.
<b>ADT</b>	Admission/Discharge/Transfer.
<b>ORU</b>	Unsolicited Observation Result.

PHC-Hub may reply to a v2.5.1 QBP with the following HL7 message:

Message	Description
<b>RSP</b>	Query Response with an RSP message is returned with a profile indicating that querying systems should determine if: <ul style="list-style-type: none"><li>• A high-confidence match was obtained.</li><li>• One or more low-confidence matches are returned in a list.</li><li>• No results could be found for the patient vaccination record.</li></ul>

## Messages Sent

PHC-Hub may send the following HL7 message:

Message	Description
<b>VXU</b>	Unsolicited vaccination record update.

## **Patient Record (VXU, DFT, ADT)**

The patient record update messages should only be sent to PHC-Hub when at least one of the following conditions applies:

- When the sending system's organization has just provided some type of service for the patient.
- When the patient's vaccination record has changed.
- When the sending system wants to send patient records as part of an initial data load. This should be coordinated with registry staff to process without changing ownership.

The sending system should not send their entire patient population each time it wants to update the registry. This causes the registry to change the patient's medical home when it wrongly assumes that the sending entity has recently provided services for the patient.

### **Patient Identifiers**

PHC-Hub looks in the Patient Identifiers list (PID-3) field for two key patient IDs to identify a patient.

- The ID the remote application uses to uniquely identify the patient. This field is required.
- The ID the IIS uses to identify the patient. Since most systems do not store this ID, it is not normally sent. The ID is optional.

### **Patient Vaccination Record (VXU)**

The VXU message contains one patient record (PID segment) and the patient's vaccination record. This is the preferred message for sending vaccination and patient records, even when a patient has no vaccinations. PHC-Hub sends and prefers to receive complete vaccination records, this way sending systems don't need to track which vaccinations the IIS has and doesn't have.

### **Post Detail Financial (DFT)**

PHC-Hub supports the DFT message for billing systems that don't currently export VXU messages. The DFT message includes patient demographic data and services recently performed, which may include vaccinations.

### **Admit/Discharge/Transfer (ADT)**

The ADT message is normally used by hospitals to communicate patient demographic information to various internal systems. The ADT message contains no vaccination information. The following ADT trigger messages are accepted: A01, A02, A03, A04, A05, A06, A07, A08, A09, A10, A14, A15, A16, A28, and A31. These messages add or update a patient record in the registry.

It is important to know that an ADT message is not required to register a patient in the registry. A VXU message without immunizations is sufficient. The ADT is accepted to allow hospital systems to register patients using a standard ADT message. Senders may choose to send ADT or VXU messages to register patients.

### **Observation Result (ORU)**

The ORU message is a generic lab reporting message that is used by labs to report on the status of lab work. PHC-Hub accepts lab messages for two different situations:

- To receive lab data with lead test results.
- To receive immunization data from the GE Centricity® EMR (Logician) via its LabLink interface in LinkLogic.

### **Query for Patient Vaccination Query (VXQ or QBP)**

The VXQ/QBP includes patient demographic data used by a registry to query another registry for a patient's vaccination record. When the IIS receives a query, it tries to match the patient data sent with patients in the registry and returns one of the following responses:

Message	Description
<b>VXR(RSP)</b>	Query response with patient vaccination record.
<b>VXX(RSP)</b>	Query response with multiple matches.
<b>QCK</b>	Query acknowledgement (no match).
<b>ACK</b>	Acknowledgment (indicates error). A negative ACK message is sent when an error prevents the completion of the request.

The standard for immunization messages does not allow the sender (the system originating the query) to specify how to do the patient query, but leaves it up to the receiving system to make that decision. Instead, the sender gives all known information about a particular patient and the receiving system must reply with exact or possible matches according to its own criteria.

PHC-Hub finds matches as follows:

1. Search for a match by patient ID. If a match is found, return this patient. If the patient query is sent with:
  - **An MPI ID** - The patient is queried by this ID and a shot record is returned.
  - **The State Registry ID** - The patient is queried by this ID and if found, a complete record is returned.
  - **The sender's Medical Record Number** - The patient's State Registry ID, including a prefix in a record entered manually via an IWeb user interface, is queried by this ID and if found, a complete record is returned.

- **The sender's Medical Record Number** - The patient's Chart Number entered via an HL7 upload as a Medical Record Number is queried by this ID and if found, a complete record is returned.
2. If no match was found in step 1, then the patient data is used to perform an advanced search which is a standard algorithm used by the main deduplication process to find exact and possible matches. The following fields are considered by the advanced search:
    - Patient Last, First, Middle Name
    - Patient Birth Date
    - Patient SSN - Patient Medicaid Number
    - Patient Birth Number
    - Guardian First Name - Guardian SSN - Mother's Maiden Name
    - Patient Address - Patient Phone
  3. If no matches are found, the interface may be configured to run additional searches such as "first initial, last name, birth date" searches; however, only a few of these additional searches are normally configured since the advanced search is the best option. PHC-Hub allows the administrator to configure each interface to have any set of optional queries included.
  4. Once matching is complete, the following apply:
    - If one exact match is found, this is returned in a VXR(RSP) message, which includes patient demographics and all immunizations.
    - If one or more matches is found, but some matches are possible, then a VXX(RSP) message is returned, which only includes the patient demographics for the possible matches.
    - If no match is found, then a QCK message is returned, to acknowledge the query and report that no matches were found.

The original CDC document specified that when there is one patient record match, the VXR(RSP) is returned; and if there are two or more matches found, then a VXX(RSP) is returned. This description assumed that all single matches would be good matches. For situations where there is only one match and it is not a good match, the IIS returns a VXX(RSP).
  5. If the sending system gets a response that indicates a multiple match, it may display the demographic information and prompt the query user to choose one.
  6. The sending system may then re-query with a message that includes the State Registry ID sent in the first response. This ensures an exact match on the second query and a return of an immunization record.



# Vaccines for Children (VFC) Tracking

IWeb and WIR can track both VFC vaccinations administered and vaccine lot inventory for providers. The following information is required to support this functionality:

- Vaccine Lot Number
- Vaccine Manufacturer
- VFC Status (of patient at time of vaccine administration) or Vaccine Publicly Supplied (Yes or No)
- (IWeb) Facility/Clinic ID (if the organization includes multiple facilities/clinics)
- (WIR) Site ID (if the organization includes multiple sites)

VFC status must be transmitted in an OBX segment. The following is an example of how this is sent:

```
OBX|1|CE|64994-7^VACCINE FUNDING PROGRAM ELIGIBILITY CATEGORY^LN|1|  
VO2^MEDICAID^HL70064|||||F|||20150202|||VXC40^ELIGIBILITY CAPTURED AT THE  
IMMUNIZATION LEVEL^CDCPHINVS
```

For IWeb integration, the HL7 interface (profile) must be configured to "Update Registry Inventory" before submitting data (**Import Profile** > **Update Settings** section > **Vaccinations** tab). Currently configured lot numbers are decremented if they match the incoming vaccine code exactly. If the lot number is sent with a typo or the VFC status is incorrect, then the correct lot number may not be decremented and no error message is displayed. It is important to correctly configure the current lot numbers and to transmit the vaccines given without typos. In addition, since lot numbers may be tracked separately for each facility, the facility **MUST** be designated if lot numbers are defined by facility.

For WIR integration, the parameter that controls vaccine lot decrementing is in WIR as part of site maintenance. Although coded fields must also match exactly with WIR, the validation step (in WIR) reports errors.

# HL7 Gateway

The HL7 Gateway is an optional adaptor that helps external systems connect to PHC-Hub. It is installed on the sender system (remote from PHC-Hub). It is not required to initiate a real-time interface, but it does enable systems that currently save data to local files or who use MLLP (HL7 Minimum Lower Level Protocol (TCP/IP)) to send data in a real-time fashion using the required HTTP-based transport protocol.

When installed on a sending system, the HL7 Gateway listens for an incoming HL7 message and immediately forwards it to the PHC-Hub inbound interface servlet using the HTTP-based protocol. After processing the message, PHC-Hub responds with an acknowledgement message which the Gateway forwards back to the originating system over the original connection. If the Gateway encounters an error in this process, it immediately returns a negative acknowledgement (NAK) back to the originating system.

For more information, see the documentation distributed with the HL7 Gateway software.

# Master Client Index (MCI) Web Service Interface

To support an electronic interface between the immunization registry (such as VacTrAK) and the Master Client Index (MCI), MultiView, a web service is available at `<context path>/soa/getPatientListingRequest/getPatientListing.wsdl`. This web service allows user accounts with the PHC-Hub Run Web Service Export permission to query the registry for all patient demographic updates that have occurred since the last time a query was made from that account. Optionally, a date can be passed to the web service causing the query to return all updates that have occurred since that date rather than since the last time a query was made.

## MCI Patient Information Request

Patient information request parameters are:

1. Date (optional; YYYYMMDD format)
2. Username (user account created in VakTrAK)
3. Password

## MCI Patient Information Returned

The patient information returned consists of:

- SIIS ID Number
- Medicaid ID Number
- SSN
- First Name
- Middle Name
- Last Name
- Suffix
- Birth Date
- Gender
- Mother's Maiden Name
- Race

- Inactive Code
- Physical Address
- Secondary Address

In addition to the patient information, a reply code may be returned if there is a problem processing the request. The codes include "Invalid username or password" or "internal error".

## MCI Restrictions on Patient Data Returned

Patient Data	Restrictions
<b>Medicaid ID</b>	Maximum length of 16 characters.
<b>SSN</b>	Maximum length of 11 and must be a valid SSN.
<b>First, last, and middle names</b>	Maximum length of 48 characters.
<b>Suffix</b>	Maximum length of 5 characters.
<b>Birth date</b>	Returned in YYYYMMDD format.
<b>Gender</b>	Must match one of the following codes: M, F, U, O
<b>Mother's maiden name</b>	Maximum length of 48 characters.
<b>Race</b>	<p>Must match one of the following codes:</p> <ul style="list-style-type: none"> <li>• Multi-racial</li> <li>• Native Hawaiian or Other Pacific Islander</li> <li>• Other</li> <li>• Unknown</li> <li>• American Indian*</li> <li>• Alaskan Native*</li> <li>• Asian</li> <li>• Black or African American</li> <li>• White</li> <li>• Hispanic-Latino</li> </ul> <p>*Separated for AK, but combined for all other states.</p>
<b>Inactive code</b>	Must match one of the following values: ACTIVE, REMOVED, MERGE
<b>Addresses</b>	<p>Consists of the following components:</p> <ul style="list-style-type: none"> <li>• <b>Address line 1</b> - Maximum length of 45 characters.</li> <li>• <b>Address line 2</b> - Maximum length of 45 characters.</li> <li>• <b>City name</b> - Maximum length of 30 characters.</li> <li>• <b>State</b> - Is a 2 character postal code.</li> <li>• <b>Zip code</b> - Must be between 5 and 10 characters and must consist of only numbers.</li> </ul>

# Sample HL7 Messages

The following sections contain sample HL7 messages.

## Sample VXU Message

### 2.3.1

```
MSH|^~\&|EPIC|^LINDAS TEST
ORGANIZATION|||VXU^V04^VXU_V04|225|P|2.5.1|||AL|PID|1||E46749^^^MR^||DOE^JOHN
^C^JR^^^L|SMITH|20140515|M|SMITH^JOHN|2106-3^WHITE^HL70005|115
MAINSTREET^^GOODTOWN^KY^42010^USA^L^010||^PRN^PH^^^270^6009800||EN^ENGLISH^HL7029
6|||523968712|||2186-5^NOT HISPANIC OR LATINO^HL70012|||N|PD1||LINDAS
TEST ORGANIZATION^^SIISCLIENT818|^^^^^^^MR|||||02^Reminder/recall-any
method^HL70215||||A^Active^HL70441|20150202^20150202
NK1|1|DOE^MARY|MTH^MOTHER^HL70063|

PV1||R|||||||||V02^20150202|

ORC|RE||9645^SIISCLIENT001||||20150202111146|2001^HARVEY^MARVIN^K|
RXA|0|1|20150202|20150202|20^DTaP^CVX^90700^DTAP^CPT|.5|ML^mL^ISO+||00^New
immunization record^NIP001|JONES^MARK|^^^SIISCLIENT818|||A7894-
2|20161115|PMC^SANOI PASTEUR^MVX|||ARXR|ID^INTRADERMAL^HL70162|LD^LEFT
DELTOID^HL70163

OBX|1|CE|64994-7^VACCINE FUNDING PROGRAM ELIGIBILITY CATEGORY^LN|1|
V02^MEDICAID^HL70064||||F||20150202||VXC40^ELIGIBILITY CAPTURED AT THE
IMMUNIZATION LEVEL^CDCPHINVS0BX|2|CE|30956-7^VACCINE
TYPE^LN|2|88^FLU^CVX||||F||20150202102525 OBX|3|TS|29768-9^Date vaccine
information statement published^LN|2|20120702||||FOBX|4|TS|29769-7^Date vaccine
information statement presented^LN|2|20120202||||F

RXA|0|1|20141215|20141115|141^influenza, SEASONAL 36^CVX^90658^Influenza
Split^CPT|999|||01^HISTORICAL INFORMATION - SOURCE UNSPECIFIED^
NIP001|||||||A
```

### 2.5.1

```
MSH|^~\&|EPIC|SIISCLIENT818^LINDAS TEST
ORGANIZATION|^SIIS||20150202115044||VXU^V04^VXU_V04|225|P|2.5.1|||AL|PID|1||E467
00^^^MR^||DOE^JOHN^C^JR^^^L|SMITH|20140515|M|SMITH^JOHN|2106-3^WHITE^HL70005|115
MAINSTREET^^GOODTOWN^KY^42010^USA^L^010||^PRN^PH^^^270^6009800||EN^ENGLISH^HL7029
6|||523968712|||2186-5^NOT HISPANIC OR LATINO^HL70012|||N|PD1|||02^Reminder/recall-any
method^HL70215||||A^Active^HL70441|20150202^20150202
NK1|1|DOE^MARY|MTH^MOTHER^HL70063|

ORC|RE||9645^SIISCLIENT818||||20150202111146|2001^HARVEY^MARVIN^K|RXA|0|1|20150
202|20150202|20^DTaP^CVX^90700^DTAP^CPT|.5|ML^mL^ISO+||00^New immunization
record^NIP001|JONES^MARK|^^^SIISCLIENT818|||A7894-2|20161115|PMC^SANOI
PASTEUR^MVX|||A RXR|ID^INTRADERMAL^HL70162|LD^LEFT

OBX|1|CE|64994-7^VACCINE FUNDING PROGRAM ELIGIBILITY CATEGORY^LN|1|
V02^MEDICAID^HL70064||||F||20150202||VXC40^ELIGIBILITY CAPTURED AT THE
```

IMMUNIZATION LEVEL^CDCPHINVS

OBX|2|CE|30956-7^VACCINE TYPE^LN|2|88^FLU^CVX|||||F|||20150202102525  
OBX|3|TS|29768-9^Date vaccine information statement  
published^LN|2|20120702|||||F OBX|4|TS|29769-7^Date vaccine information  
statement presented^LN|2|20120202|||||F

RXA|0|1|20141215|20141115|141^influenza, SEASONAL 36^CVX^90658^Influenza  
Split^CPT|999|||01^HISTORICAL INFORMATION - SOURCE UNSPECIFIED^  
NIP001|||||||A

## Sample ACK Message

MSH|^~\&|^|DOE^^|DCC^^|DOE^^|20050829141336||ACK^|1125342816253.100000055|P|2.3.1|  
MSA|AE|00000001|Patient id was not found, must be of type 'MR'|||^HL70357|  
ERR|PID^1^3^^^HL70357|

## Sample VXQ Message

MSH|^~\&|DBO^QSI Insight^L|QS4444|5.0^QSI Insight^L||20030828104856+0000||VXQ^V01|QS444437861000000042|P|2.3.1||NE|AL|  
QRD|20030828104856+0000|R|I|QueryID01|||5|000000001^Bucket^Pail^^^^^^^MR|VXI|SIIS|  
QRF|QS4444|20030828104856+0000|20030828104856+0000||100000001~19460401~~~~~1  
Somewhere Lane Boulevard^Indianapolis^IN~10000|

## Sample QCK Message

MSH|^~\&|5.0^QSI Insight^L|^|DBO^QSI Insight^L|QS4444^^|20051019154952||QCK^|1129754992182.100000002|P|2.3.1|  
MSA|AA|QS444437861000000042|No patients found for this query|  
QAK||NF|

## Sample VXX Message

MSH|^~\&|5.0^QSI Insight^L|^|DBO^QSI Insight^L|QS4444^^|20051019163235||VXX^V02|1129757555111.100000025|P|2.3.1|  
MSA|AA|QS444437861000000042||  
QRD|20030828104856|R|I|QueryID01|||5|10^SNOW^MARY^^^^^^^SR|VXI^Vaccine Information^HL70048|SIIS|  
QRF|QS4444|20030828104856|20030828104856||100000001~20021223|  
PID|1||41565^^^^SR~2410629811:72318911||SNOW^MARY^^^^^L||20021223|F|||2 NORTH WAY RD^^MOORESVILLE^INDIANA^46158^^M|| (317) 123-4567^^PH||EN^English^HL70296|||||||N|  
PID|2||28694^^^^SR~2663391364:11111111||FROG^KERMIT^^^^^L||20021223|  
NK1|1|PIGGY^MISS|GRD^Guardian^HL70063|

## Sample VXR Message

```
MSH|^~\&|5.0^QSI Insight^L|^|DBO^QSI Insight^L|QS4444^^|20051019163315||VXR^V03|1129
757595953.100000029|P|2.3.1|
MSA|AA|QS444437861000000042||
QRD|20030828104856|R|I|QueryID01|||5|41565^SNOW^MARY^^^^^^^^^SR|VXI^Vaccine
Information^HL70048|SIIS|
QRF|QS4444|20030828104856|20030828104856||100000001~20021223|
PID|1||41565^^^^SR~2410629811:72318911||FROG^KERMIT^^^^^L|20021223|F|||3 SOUTH
WAY RD^^MOORESVILLE^INDIANA^46158^^M|| (317) 222-
1234^^PH||EN^English^HL70296|||N|PD1|||^^^^^SR|^^^^^^^^^SR|||
02^Reminder/recall -any method^HL70215|||A^Active^HL70441|
PV1||R|
```

## Sample ORU Message

```
MSH|^~\&|LinkLogic-2149|2149001^BMGPED|CHIRPS-Out|BMGPED|20060915210000||ORU^R01
|1473973200100600|P|2.3||NE|NE
PID|1||00000-0000000|000000|AAAAAAAA^AAAAA^A||00000000|M|U|00000 A AA AA
AAA^AAAAAA^AA^00000 ||(000)000-0000||S||000-00-0000
PV1|1|O|^BMGPED|||dszczepaniak
OBR|1||5^Preload||20060915095920|||donaldduck||Z
OBX|1|ST|CPT-90707.2^MMR #2||given||||R||20040506095950
OBX|2|ST|CPT-90737.4^HEMINFB#4||given||||R||19931103100050
OBX|3|ST|CPT-90707.1^MMR #1||given||||R||19931103095950
OBX|4|ST|CPT-90731.3^HEPBVAX#3||given||||R||19930712100120
OBX|5|ST|CPT-90731.2^HEPBVAX#2||given||||R||19930112100120
OBX|6|ST|CPT-90737.3^HEMINFB#3||given||||R||19930112100050
OBX|7|ST|CPT-90731.1^HEPBVAX#1||given||||R||19921027100120
OBX|8|ST|CPT-90737.2^HEMINFB#2||given||||R||19921027100050
OBX|9|ST|CPT-90737.1^HEMINFB#1||given||||R||19920826100050
```

## Sample QBP Message

```
MSH|^~\&||GA0000||MA0000|199705221605||QBP^Q11^QBP_Q11|19970522GA40|T|2.5.1||NE|
AL|||Z34^CDCPHINVS|
QPD|Z34^Request Immunization
History^CDCPHINVS|19970522GA05|25^^^STATE_IIS^MR|FLOYD^FRANK^R^^^^L|MALLARD^F|200
30123|M|8444 N. 90th Street^Suite
100^Scottsdale^AZ^85258^USA^L|^PRN^PH^^^480^7458554
RCP|I|20^RD|R
```

## Sample RSP Message - Exact Match

```
MSH|^~\&|^|MA0000^^|^|GA0000^^|20111105122535||RSP^K11^RSP_K11|1320521135996.10
0000002|T|2.5.1|||Z32^CDCPHINVS^^|
MSA|AA|19970522GA40||
QAK||Z34^Request Immunization History^HL70471|
QPD|Z34^Request Immunization
History^HL70471|19970522GA05||FLOYD^FRANK^^^^^L|MALIFICENT|20030123|M|L|
PID|1||25^^^SR~0001||FLOYD^FRANK^^^^^L|20030123|M||612 S WRIGHT
CT^^KENNEWICK^WASHINGTON^99366^United States^M|| (509) 421-
0355^^PH^^509^4210355^|||N|
```

```

PD1|||^^^^^SR|21^MATT^SHAKY^K^^^^^^^^SR~1679652135|||02^Reminder/recall -
any method^HL70215|||A^Active^HL70441|
NK1|1|FLOYD^MALIFICENT|GRD^Guardian^HL70063|
PV1||R|
ORC|RE||25.34.20100723|
RXA|0|999|20100723|20100723|83^Hep A, ped/adol, 2 dose^CVX^90633^Hep A 2 dose -
Ped/Adol^CPT~34^Hep A 2 dose - Ped/Adol^STC0292|
999|||00^New immunization record^NIP001||IRMS-
1000|||AHAVB379AA||SKB^GlaxoSmithKline^HL70227|||A|20111105122536|
RXR|IM^Intramuscular^HL70162|LT^Left Thigh^HL70163|
OBX|1|CE|VFC-STATUS^VFC Status^STC||V02|||F|
OBX|1|CE|30963-3^Vaccine purchased with^LN||PBF^Public funds^NIP008|||F|
OBX|1|CE|VFC-STATUS^VFC Status^STC|||F|
OBX|1|DT|29768-9^date vaccine information statement
published^LN||20100120|||F|
OBX|1|DT|29769-7^date vaccine information statement
presented^LN||20100723|||F|
ORC|RE||25.34.20100728|

```

## Sample RSP Message - Multiple Matches

```

MSH|^~\&|^|MA0000^^|^|GA0000^^|20111104153354||RSP^K11^RSP_K11|1320446034070.10
0000002|T|2.5.1|||Z31^CDCPHINVS^^|
MSA|AA|19970522GA40||
QAK|||Z34^Request Immunization History^HL70471|
QPD|Z34^Request Immunization
History^HL70471|19970522GA05||^JOHN^^^^^L|Que^MALIF^^^^^M|20030123|M|L|
PID|1||25^^^^SR||FLOYD^FRANK^^^^^L||20030123|
PD1|||^^^^^SR|^^^^^^^^^^^^SR|
NK1|1|FLOYD^MALIFICENT|GRD^Guardian^HL70063|
PID|2||85^^^^SR||HENRY^JOHN^^^^^L||20011010|
PD1|||^^^^^SR|^^^^^^^^^^^^SR|
NK1|1|^MARY|GRD^Guardian^HL70063|
PID|3||26^^^^SR||KENNEDY^JOHN^FITZGERALD^^^^^L||19900607|
PD1|||^^^^^SR|^^^^^^^^^^^^SR|
NK1|1|KENNEDY^JACQUELINE^LEE|GRD^Guardian^HL70063|

```

## Sample RSP Message - With Forecast Information

```

MSH|^~\&|^|MA0000^^|^|GA0000^^|20111105122535||RSP^K11^RSP_K11|1320521135996.10
0000002|T|2.5.1|||Z32^CDCPHINVS^^|
MSA|AA|19970522GA40||
QAK|||Z34^Request Immunization History^HL70471|
QPD|Z34^Request Immunization
History^HL70471|19970522GA05||FLOYD^FRANK^^^^^L|MALIFICENT|20030123|M|L|
PID|1||25^^^^SR~0001||FLOYD^FRANK^^^^^L||20030123|M||612 S WRIGHT
CT^^KENNEWICK^WASHINGTON^99366^United States^M|| (509) 421-
0355^^PH^^509^4210355^|||||N|
PD1|||^^^^^SR|21^MATT^SHAKY^K^^^^^^^^SR~1679652135|||02^Reminder/recall -
any method^HL70215|||A^Active^HL70441|
NK1|1|FLOYD^MALIFICENT|GRD^Guardian^HL70063|
PV1||R|
ORC|RE||25.34.20100723|
RXA|0|999|20120727112142|20120727112142|998^no vaccine

```



```

administered^CVX|0|20120727112144|
OBX|1|CE|30956-7^vaccine type^LN||0^DTP/aP^CVX||||F|
OBX|1|CE|59779-9^Immunization Schedule used^LN||VXC16^ACIP^CDCPHINVS||||F|
OBX|1|NM|30973-2^Dose number in series^LN||4||||F|
OBX|1|TS|30980-7^Date vaccination due^LN||20121206||||F|
OBX|1|TS|30981-5^Earliest date to give^LN||20121206||||F|
OBX|1|TS|59777-3^Latest date next dose should be given^LN||20161101||||F|
OBX|1|TS|59778-1^Date dose is overdue^LN||20130106||||F|
OBX|1|CE|59783-1^Status in immunization series^LN||U^Up to Date^STC0002||||F|
ORC|RE||9999|
RXA|0|999|20120727112142|20120727112142|998^no vaccine
administered^CVX|0|20120727112144|
OBX|1|CE|30956-7^vaccine type^LN||0^Hib^CVX||||F|
OBX|1|CE|59779-9^Immunization Schedule used^LN||VXC16^ACIP^CDCPHINVS||||F|
OBX|1|NM|30973-2^Dose number in series^LN||1||||F|
OBX|1|TS|30980-7^Date vaccination due^LN||20100102||||F|
OBX|1|TS|30981-5^Earliest date to give^LN||20091214||||F|
OBX|1|TS|59777-3^Latest date next dose should be given^LN||20141101||||F|
OBX|1|TS|59778-1^Date dose is overdue^LN||20100202||||F|
OBX|1|CE|59783-1^Status in immunization series^LN||P^Past Due^STC0002||||F|
ORC|RE||9999|
RXA|0|999|20120727112142|20120727112142|998^no vaccine
administered^CVX|0|20120727112144|
OBX|1|CE|30956-7^vaccine type^LN||0^MCV4^CVX||||F|
OBX|1|CE|59779-9^Immunization Schedule used^LN||VXC16^ACIP^CDCPHINVS||||F|
OBX|1|NM|30973-2^Dose number in series^LN||1||||F|
OBX|1|TS|30980-7^Date vaccination due^LN||20201102||||F|
OBX|1|TS|30981-5^Earliest date to give^LN||20201102||||F|
OBX|1|TS|59777-3^Latest date next dose should be given^LN||20641101||||F|
OBX|1|TS|59778-1^Date dose is overdue^LN||20211102||||F|
OBX|1|CE|59783-1^Status in immunization series^LN||U^Up to Date^STC0002||||F|
ORC|RE||9999|
RXA|0|999|20120727112142|20120727112142|998^no vaccine
administered^CVX|0|20120727112144|
OBX|1|CE|30956-7^vaccine type^LN||0^Pneumococcal^CVX||||F|
OBX|1|CE|59779-9^Immunization Schedule used^LN||VXC16^ACIP^CDCPHINVS||||F|
OBX|1|NM|30973-2^Dose number in series^LN||1||||F|
OBX|1|TS|30980-7^Date vaccination due^LN||20100102||||F|
OBX|1|TS|30981-5^Earliest date to give^LN||20091214||||F|
OBX|1|TS|59777-3^Latest date next dose should be given^LN||20151001||||F|
OBX|1|TS|59778-1^Date dose is overdue^LN||20100202||||F|
OBX|1|CE|59783-1^Status in immunization series^LN||P^Past Due^STC0002||||F|

```

## Sample VXU Message - With Contraindications

```

MSH|^~\&||MA0000||GA0000|19970901||VXU^V04|19970522MA53|T|2.3.1||NE|AL|
PID||1234^^^^SR~1234-
12^^^^LR~3872^^^^MR~221345671^^^^SS~430078856^^^^MA^||KENNEDY^JOHN^FITZGERALD^J
R^^^^L|BOUVIER^^^^^M|19900607|M|KENNEDY^BABYBOY^^^^^B|2106-3^WHITE^HL70005|123
MAIN ST^APT 3B^LEXINGTON^MA^00210^^M^MSA CODE^MA034~345 ELM
ST^^BOSTON^MA^00314^^BDL~^^^^^BR^^MA002|| (617) 555-
1212^PRN^PH^^617^5551212^^|EN^ENGLISH^ HL70296^^|N^NOT HISPANIC OR
LATINO^HL70189^2186-5^NOT HISPANIC OR LATINO^CDCRE1|CHILDREN'S HOSPITAL|
PD1||CHILDREN'S CLINIC ^L^1234^^^^FI^LEXINGTON
HOSPITAL&5678&XX|12345^WELBY^MARCUS^^^DR^MD^^L^^DN|||||03^REMINDER/RECALL -
NO CALLS^HL70215|Y|19900607||A|19900607|19900607|

```

NK1|1|KENNEDY^JACQUELINE^LEE|MTH^MOTHER^HL70063|||||||||||||||||8986  
 66725^^^^SS|  
 NK1|2|KENNEDY^JOHN^FITZGERALD|FTH^FATHER^HL70063|||||||||||||||||822  
 546618^^^^SS|  
 PV1||R|||||||A|||V02^19900607~H02^19900607|  
 RXA|0|1|19900607|19900607|08^HEPB-PEDIATRIC/ADOLESCENT^CVX^90744^HEPB-  
 PEDATRIC/ADOLESCENT^CPT|.5|ML^ISO+||03^HISTORICAL INFORMATION - FROM PARENT'S  
 WRITTEN RECORD^NIP0001|^JONES^LISA|^^^CHILDREN'S  
 HOSPITAL||5|MCG^ISO+|MRK12345|199206|MSD^MERCK^MVX|  
 RXA|0|4|19910907|19910907|50^DTAP-HIB^CVX^90721^DTAP-HIB^CPT|.5|ML^ISO+||00^NEW  
 IMMUNIZATION  
 RECORD^NIP0001|1234567890^SMITH^SALLY^S^^^^^^^VEI~1234567891^O'BRIAN^ROBERT^A^^  
 DR^MD^^^^^OEI|^^^CHILD HEALTHCARE CLINIC^^^^^101 MAIN  
 STREET^^BOSTON^MA|||W46932777|199208|PMC^PASTEUR MERIEUX  
 CONNAUGHT^MVX||CP|A|19910907120030|  
 RXR|IM^INTRAMUSCULAR^HL70162|LA^LEFT ARM^HL70163|  
 RXA|0|5|19950520|19950520|20^DTAP^CVX|.5|ML^ISO+||1234567891^O'BRIAN^ROBERT^A^^  
 DR|^^^CHILD HEALTHCARE CLINIC^^^^^101 MAIN  
 STREET^^BOSTON^MA|||W22532806|19950705|PMC^PASTEUR MERIEUX CONNAUGHT^MVX|  
 RXR|IM^INTRAMUSCULAR^HL70162|LA^LEFT ARM^HL70163|  
 OBX|1|CE|30963-3^Vaccine purchased with^LN||PBF^Public funds^NIP008|||||F|  
 OBX|2|CE|VFC-STATUS^VFC Status^STC||V02|||||F|  
 OBX|3|TS|29768-9^DATE VACCINE INFORMATION STATEMENT  
 PUBLISHED^LN|1|19950520|||||F||20100920  
 OBX|4|TS|29769-7^DATE VACCINE INFORMATION STATEMENT PRESENTED  
 ^LN|1|19950520|||||F||20100920  
 RXA|0|0|20090531132511|20090531132511|3^MMR^CVX|0||||^Sticker^Nurse|^^^DCS\_DC|||  
 ||  
 OBX|1|CE|30945-0^Vaccination contraindication/precaution^LN|1|26^allergy to  
 thimerasol (anaphylactic)^STC|||||F||20090415  
 RXA|0|1|20090531132511|20090531132511|3^MMR^CVX|999||||^Sticker^Nurse|^^^DCS\_DC||  
 |||||8

# ONC HUB IWeb and PHC-Hub Overview

The Office of the National Coordinator (ONC) sponsored a pilot project to connect two states through a CDC-initiated HUB. The project converts the point-to-point data exchange to HL7 via the CDC sponsored HUB. The connection allows inter-state HL7 message exchange using best practice specifications. Washington and Oregon were selected as candidate states due to their existing point-to-point exchange and sharing agreement.

To facilitate connectivity between Washington and the ONC HUB, additional functionality is required for IWeb to allow management of the ONC HUB profile. To set up connectivity, you must:

1. [Create a KeyStore and TrustStore for TLS client authentication.](#)
2. [Create an ONC IWeb Exchange Partner Organization.](#)
3. [Create an ONC IWeb Organization User Account.](#)
4. [Create an ONC IWeb Remote Registry Configuration.](#)
5. [Configure IWeb User HL7 Settings.](#)
6. [Create an ONC Import Profile.](#)
7. [Configure ONC Application Settings.](#)

## Create a KeyStore and TrustStore

A KeyStore and TrustStore for TLS client authentication are required before configuring the remote registry. However, STC cannot create these files since they contain a secret identity key that should never leave their servers.

Use the following reference to assist in creating the KeyStore and TrustStore:  
<https://docs.oracle.com/cd/E19509-01/820-3503/ggfgo/index.html>

States must also contact the Hub technical resources so that the Hub starts trusting their new identity key. The current contacts are:

- Matthew Tiller: [matthew.tiller@esacinc.com](mailto:matthew.tiller@esacinc.com)
- Michal Kotelba: [michal.kotelba@esacinc.com](mailto:michal.kotelba@esacinc.com)
- Amanda J Nash: [amanda.j.nash@accenturefederal.com](mailto:amanda.j.nash@accenturefederal.com)

## Create an ONC IWeb Exchange Partner Organization

In IWeb, create a new organization to allow partners to send updates to and query the system (**Organization (IRMS) > Search/Add > Search > Add**) with the following settings:

Field	Setting
<b>Name</b>	Enter a name that identifies the state/trading partner. We recommend you use: ONCHUB-StateName. This naming convention groups your interstate exchange in your organization list.
<b>Automatic ownership blocked</b>	Select this option to prevent updates from this organization from taking ownership from the primary care provider's organization/facility.
<b>Require Manual Deduplication for Intra-Organization (IRMS) Merges</b>	Clear this option to allow other states to send messages to the Registry without being forced into manual deduplication.

## Create an ONC IWeb Organization User Account

You must create the following users:

- A user to be the authorized account for the data exchange partner to query and receive updates.
- A user to be the authorized account for you to query and receive updates from the data exchange partner.

In IWeb, create the users (**Administration > Search/Add User > Search > Add**) with the following settings:

Field	Setting
<b>Name</b>	Name one user after the trading partner. Name the second user after yourself. For example, ONCHUB-Statename.
<b>Access Level</b>	Set to <b>No Login</b> .
<b>Organization (IRMS)</b>	Set to the organization you created in the <a href="#">previous section</a> .
<b>Permissions</b>	Select <b>Upload HL7 Access</b> .

## Create an ONC IWeb Remote Registry Configuration

In IWeb, create a new remote registry (**Patient > Remote Registry**) with the following settings:

Field	Setting
<b>Title</b>	Enter a name that identifies the state. For example, ONC-Statename.
<b>Application Type</b>	Select <b>CDC Standard</b> .
<b>Updating User</b>	Select the user you created in the <a href="#">previous step</a> that is named after yourself.
<b>Transport Type</b>	Select <b>ONC Hub</b> .
<b>WSDL URL</b>	Enter the URL provided by the ONC HUB.
<b>User ID</b>	Enter the ID the state/trading partner wants you to use.
<b>Password</b>	Enter the password that the state/trading partner wants you to use.
<b>Keystore Filepath</b>	Enter the location of keystore.jks on the production app server.
<b>Keystore Password</b>	Enter the password for keystore.jks.
<b>Truststore Filepath</b>	Enter the location of truststore.jks on the production app server.
<b>Truststore password</b>	Enter the password for truststore.jks.
<b>Destination</b>	Enter the destination code the Hub wants you to use to send messages to the state/trading partner.
<b>Partner State code</b>	Enter the 2 digit code used to internally designate the partner state/trading partner.
<b>HL7 Version</b>	Select <b>2.5.1</b> .
<b>Outgoing Query Type</b>	Select <b>XVQ</b> .
<b>Visible</b>	Select this option.
<b>Enabled</b>	Select this option.

## Configure IWeb User HL7 Settings

In IWeb, configure the HL7 settings (**Settings > HL7 Uploads**) for this exchange with the following settings. These accounts are the authorized accounts for sending and receiving messages to the ONC HUB.

Section	Field	Setting
Update settings	<b>Deduplicate</b>	Select <b>Immediately</b> .
Update settings	<b>Update Current Patients</b>	Select this option.
Update settings	<b>Insert patient as historical (non-owned)</b>	Select this option.
Update settings	<b>Insert vaccination as historical</b>	Select this option.
Update settings	<b>Update registry inventory</b>	Do not select this option.
Update settings	<b>Insert if sent (Primary facility, Administered-at location, Primary physicians, Vaccinators)</b>	Do not select any of the insert options.
Query Settings (VXQ Only)	<b>Return all normally private demographic fields from the master patient record</b>	Select this option.
Record Export Options for Queries and Updates	<b>Send vaccinations as historical</b>	Select this option.

# Create an ONC Import Profile

Add an import profile to be used by PHC-Hub to facilitate the transfer.

**NOTE:** If the user creates more than one profile (NOT RECOMMENDED), they need to use User Link to disable all but the profile they want to use.

Log in to PHC-Hub under the Exchange Partner Organization (IRMS) you created for ONC HUB and create the profile with the following settings:

Section	Field	Setting
Edit Import Profile	<b>Name</b>	Enter a name that describes the State/Trading Partner.
Edit Import Profile	<b>Enabled</b>	Select this option.
Edit Import Profile	<b>HL7 Version</b>	Select <b>2.5.1</b> .
Update Settings > General	<b>Import Data</b>	Select <b>Patient</b> and <b>Vaccine</b> .
Update Settings > General	<b>Deduplicate After Import</b>	Select this option.
Update Settings > Vaccinations	<b>Force Vaccinations Historical</b>	Select this option.
Update Settings > Vaccinations	<b>Update Registry Inventory</b>	Select this option.
Update Settings > Patient	<b>Update Current Patients</b>	Select this option.
Update Settings > Patient	<b>Insert patient as historical (non-owned)</b>	Select this option.
Query Settings	<b>Return all normally private demographic fields from the master patient record</b>	Select this option.
Query Settings	<b>Exclude &gt; Vaccinations with no CPT code, Vaccinations with no CVX code, Vaccinations last updated by the querying HL7 user's account, Vaccinations outside query range and not new patient</b>	Do not select any of the Exclude options.
Issue Resolution	<b>All</b>	Set issue resolution options as appropriate for the account.

## Configure ONC Application Settings

In PHC-Hub, set Application Settings (**Main > App Settings**) for the Exchange Partner Organization (IRMS) for ONC HUB with the following settings:

Field	Setting
<b>Registry Base URL</b>	Enter the registry's base URL.

Field	Setting
<b>PHC-Hub External Base URL</b>	Enter PHC-Hub's external base URL.

# IWeb HL7 Crosswalk

The HL7 Crosswalk details the mapping of HL7 messages and IWeb fields.

## 2.3.1 Crosswalk

### Demographics

Field Name	Corresponding HL7 Field	Special Notes
<b>First Name</b>	PID-5.2	
<b>Middle Name</b>	PID-5.3	
<b>Last Name</b>	PID-5.1	
<b>Suffix</b>	PID-5.4	
<b>Birth Date</b>	PID-7	
<b>Birth File #</b>	PID-3.1*	The value of HL7 field PID-3.5 determines which IWeb field is populated from PID-3.1.
<b>Sex</b>	PID-8	
<b>Mother Maiden Name</b>	PID-6	
<b>Race</b>	Derived from PID-10	These IWeb fields are automatically mapped from their equivalent value in HL7.
<b>Ethnicity</b>	Derived from PID-22	These IWeb fields are automatically mapped from their equivalent value in HL7.
<b>Language</b>	PID-15.1	
<b>SSN</b>	PID-3.1*	The value of HL7 field PID-3.5 determines which IWeb field is populated from PID-3.1.
<b>Medicaid #</b>	PID-3.1*	The value of HL7 field PID-3.5 determines which IWeb field is populated from PID-3.1.
<b>Multiple Birth (first drop-down)</b>	PID-25	
<b>Inactive</b>	Derived from PID-29	This IWeb field is marked if the HL7 message includes a date and time of death.
<b>VFC Status</b>	PV1-20	Included for backwards compatibility.
<b>Block Recall</b>	Derived from PD1-11.1	
<b>Address1</b>	PID-11.1	
<b>Address2</b>	PID-11.2	
<b>City</b>	PID-11.3	
<b>State</b>	PID-11.4	
<b>Postal Code</b>	PID-11.5	
<b>Country</b>	Derived from PID-11.6	
<b>County/Parish</b>	Derived from PID-11.5	The country code in IWeb is automatically mapped to its proper PHIN value set ("County") based on the patient's



Field Name	Corresponding HL7 Field	Special Notes
		postal code as listed in the HL7 message.
<b>Phone</b>	PID-13.1	Area code and phone number.
<b>Email</b>	PID-13.4	
<b>Guardian 1 First</b>	NK1-2.2+	These IWeb fields are only populated from HL7 when the value of NK1-3.1 is a guardian-type code (FTH, GRD, MTH, or PAR).
<b>Guardian 1 Middle</b>	NK1-2.3+	These IWeb fields are only populated from HL7 when the value of NK1-3.1 is a guardian-type code (FTH, GRD, MTH, or PAR).
<b>Guardian 1 Last</b>	NK1-2.1+	These IWeb fields are only populated from HL7 when the value of NK1-3.1 is a guardian-type code (FTH, GRD, MTH, or PAR).
<b>Guardian 1 SSN</b>	NK1-33.1+	These IWeb fields are only populated from HL7 when the value of NK1-3.1 is a guardian-type code (FTH, GRD, MTH, or PAR).
<b>Guardian Work Phone</b>	NK1-6.6 and NK1-6.7	Area code and phone number.
<b>(Alias) First Name</b>	PID-9.2	
<b>(Alias) Last Name</b>	PID-9.2	
<b>NAIC Code</b>	IN1-2.1	
<b>Physician</b>	PD1-4.1	
<b>Facility</b>	PD1-3.3	Used if recognized.
<b>Birth Facility</b>	PID-23	
<b>Date of Death</b>	PID-29	
<b>Birth Country</b>	PID-11.4♦	The IWeb fields are only populated from HL7 when the value of PID-11.7 is BDL.
<b>Birth State</b>	PID-11.7♦	The IWeb fields are only populated from HL7 when the value of PID-11.7 is BDL.

+ These form fields are populated from the specified HL7 fields only when NK1-3.1 is one of the following codes: FTH, GRD, MTH, PAR.

♦ These form fields are populated from the specified HL7 fields only when PID-11.7 is valued as BDL (birth delivery location).

\* These fields are populated from the PID-3.1 HL7 field based on the value of PID-3.5.

PID-3.5 Value	Form field populated
<b>BR</b>	Birth File #
<b>MA</b>	Medicaid #
<b>SS</b>	SSN

## Vaccination

Field Name	Corresponding HL7 Field	Special Notes
<b>Vaccine</b>	Derived from RXA-5.1 or RXA-5.4	This IWeb field is automatically mapped from its equivalent value in HL7, using either the CVX or CPT code in RXA-5.
<b>Date Administered</b>	RXA-3	
<b>Historical</b>	RXA-9.1	
<b>Manufacturer</b>	RXA-17.1	
<b>Lot Number</b>	RXA-15	
<b>Vaccinator</b>	RXA-10.1	
<b>Anatomical Site</b>	RXA-2.1	
<b>Anatomical Route</b>	RXA-1.2	
<b>Volume (CC)</b>	RXA-6	
<b>VFC Status</b>	OBX-5	Only when OBX-3.1 is valued as 64994-7.
<b>Ordering Provider</b>	ORC-12	
<b>Comments</b>	NTE-3	

## Contraindication

Field Name	Corresponding HL7 Field	Special Notes
<b>Facility where documented</b>	RXA-11 (if recognized)	This IWeb field only populates from the HL7 message if the Facility ID listed in RXA-11 is recognized by the system.
<b>Date Documented</b>	OBX-14	
<b>Vaccine</b>	OBX-5	For contraindications, the type of vaccine, contraindication description, and permanent status are all determined by a single HL7 contraindication concept code which is sent in OBX-5.
<b>Contraindication</b>	OBX-5	For contraindications, the type of vaccine, contraindication description, and permanent status are all determined by a single HL7 contraindication concept code which is sent in OBX-5.
<b>Permanent</b>	OBX-5	

## 2.5.1 Crosswalk

### Demographics

Field Name	Corresponding HL7 Field	Special Notes
<b>First Name</b>	PID-5.2	
<b>Middle Name</b>	PID-5.3	
<b>Last Name</b>	PID-5.1	
<b>Suffix</b>	PID-5.4	
<b>Birth Date</b>	PID-7	
<b>Birth File #</b>	PID-3.1*	The value of HL7 field PID-3.5 determines which IWeb field is populated from PID-3.1.
<b>Sex</b>	PID-8	
<b>Mother Maiden Name</b>	PID-6	
<b>Race</b>	Derived from PID-22	These IWeb fields are automatically mapped from their equivalent value in HL7.
<b>Ethnicity</b>	Derived from PID-22	These IWeb fields are automatically mapped from their equivalent value in HL7.
<b>Language</b>	PID-15.1	
<b>SSN</b>	PID-3.1*	The value of HL7 field PID-3.5 determines which IWeb field is populated from PID-3.1.
<b>Medicaid #</b>	PID-3.1*	The value of HL7 field PID-3.5 determines which IWeb field is populated from PID-3.1.
<b>Multiple Birth (first drop-down)</b>	PID-25	
<b>Inactive</b>	Derived from PID-29	This IWeb field is marked if the HL7 message includes a date and time of death.
<b>VFC Status</b>	PV1-20	Included for backwards compatibility.
<b>Block Recall</b>	Derived from PD1-11.1	
<b>Address1</b>	PID-11.1	
<b>Address2</b>	PID-11.2	
<b>City</b>	PID-11.3	
<b>State</b>	PID-11.4	
<b>Postal Code</b>	PID-11.5	
<b>Country</b>	Derived from PID-11.6	
<b>County/Parish</b>	Derived from PID-11.5	The country code in IWeb is automatically mapped to its proper PHIN value set ("County") based on the patient's postal code as listed in the HL7 message.
<b>Phone</b>	PID-13.6 and PID-13.7	Area code and phone number.
<b>Email</b>	PID-13.4	
<b>Guardian 1 First</b>	NK1-2.2+	These IWeb fields are only populated from HL7 when the value of NK1-3.1 is a guardian-type code (FTH, GRD,

Field Name	Corresponding HL7 Field	Special Notes
		MTH, or PAR).
<b>Guardian 1 Middle</b>	NK1-2.3+	These IWeb fields are only populated from HL7 when the value of NK1-3.1 is a guardian-type code (FTH, GRD, MTH, or PAR).
<b>Guardian 1 Last</b>	NK1-2.1+	These IWeb fields are only populated from HL7 when the value of NK1-3.1 is a guardian-type code (FTH, GRD, MTH, or PAR).
<b>Guardian 1 SSN</b>	NK1-33.1+	These IWeb fields are only populated from HL7 when the value of NK1-3.1 is a guardian-type code (FTH, GRD, MTH, or PAR).
<b>Guardian Work Phone</b>	NK1-6.6 and NK1-6.7	Area code and phone number.
<b>(Alias) First Name</b>	PID-9.2	
<b>(Alias) Last Name</b>	PID-9.1	
<b>NAIC Code</b>	IN1-2.1	
<b>Physician</b>	PD1-4.1	
<b>Facility</b>	PD1-3.3	Used if recognized.
<b>Birth Facility</b>	PID-23	
<b>Date of Death</b>	PID-29	
<b>Birth Country</b>	PID-11.4♦	The IWeb fields are only populated from HL7 when the value of PID-11.7 is BDL.
<b>Birth State</b>	PID-11.7♦	The IWeb fields are only populated from HL7 when the value of PID-11.7 is BDL.

\* These fields are populated from the PID-3.1 HL7 field based on the value of PID-3.5.

+ These form fields are populated from the specified HL7 fields only when NK1-3.1 is one of the following codes: FTH, GRD, MTH, PAR

♦ These form fields are populated from the specified HL7 fields only when PID-11.7 is valued as BDL (birth delivery location).

## Vaccination

Field Name	Corresponding HL7 Field	Special Notes
<b>Vaccine</b>	Derived from RXA 5.1 or RXA-5.4	This IWeb field is automatically mapped from its equivalent value in HL7, using either the CVX or CPT code in RXA-5.
<b>Date Administered</b>	RXA-3	
<b>Historical</b>	RXA-9.1	
<b>Manufacturer</b>	RXA-17.1	
<b>Lot Number</b>	RXA-15	
<b>Vaccinator</b>	RXA-10.1	

Field Name	Corresponding HL7 Field	Special Notes
<b>Anatomical Site</b>	RXA-2.1	
<b>Anatomical Route</b>	RXA-1.2	
<b>Volume (CC)</b>	RXA-6	
<b>VFC Status</b>	OBX-5	Only when OBX-3.1 is valued as 64994-7.
<b>Ordering Provider</b>	ORC-12	

## Contraindication

Field Name	Corresponding HL7 Field	Special Notes
<b>Facility where documented</b>	RXA-11 (if recognized)	This IWeb field only populates from the HL7 message if the Facility ID listed in RXA-11 is recognized by the system.
<b>Date Documented</b>	OBX-14	
<b>Vaccine</b>	Derived from RXA-5.1 or RXA-5.4	For contraindications, the type of vaccine, contraindication description, and permanent status are all determined by a single HL7 contraindication concept code which is sent in OBX-5.
<b>Contraindication</b>	OBX-5	For contraindications, the type of vaccine, contraindication description, and permanent status are all determined by a single HL7 contraindication concept code which is sent in OBX-5.

# Workaround for GE Centricity

Older versions of the GE Centricity EHR system (known as Logician) don't support the VXU message required by the CDC to connect to registries. However, they do support the ORU message which is normally used to report lab test results. This format is unusual, but can be used to transfer data.

Logician has a module called LinkLogic, which includes LabLink. While LabLink's main use is to receive test result data from labs, it can be used to export data. Vaccination data is stored in Logician using OBSTERM codes, which can be grouped together into Flowsheets. An export interface is associated with a Flowsheet and all associated OBSTERM codes can then be exported.

Since Logician stores immunizations differently, it makes the interface quite a bit different from other HL7 interfaces. For example, while most immunization applications use one code to represent a DTaP series, Logician uses nearly 50. Each code represents a different aspect of a particular dose in a series. The following is a small subset of OBS TERM codes for DTaP:

DTaP	CPT	By	Lot	MVX
1st	90700	DTAP #1BY	DTAP #1LOT	DTAP #1MFR
2nd	90700	DTAP #2BY	DTAP #2LOT	DTAP #2MFR
3rd	90700	DTAP #3BY	DTAP #3LOT	DTAP #3MFR
4th	90700	DTAP #4BY	DTAP #4LOT	DTAP #4MFR
5th	90700	DTAP #5BY	DTAP #5LOT	DTAP #5MFR

## IWeb-Logician Code Map Spreadsheet

To integrate with IWeb, codes must be translated into CPT codes. Then, an XML document fragment must be added to the import profile (Import Profile > **HL7 Observation Settings (ORU Only)** section > **Observation definition** field). The "IWeb-Logician Code Map" spreadsheet helps create and edit the XML. This spreadsheet contains all the Logician codes and can automatically generate the XML. The spreadsheet was created for your convenience; it is not required for creating the XML. There may be other ways of managing the codes that work better for you.

**NOTE:** The code map spreadsheet should only be edited by someone who understands Microsoft Excel and can create and edit formulas. The XML is automatically generated and if rows are added or removed, it affects the formulas. Make sure there is a formula for each row that you are adding to the XML.

1. Open the IWeb-Logician Code Map spreadsheet in Microsoft Excel.
2. Use the CODES tab to add information in the following columns. When working with a new interface, make sure that all the codes they plan to send to you are represented in the worksheet:

Column	Description
<b>OBS TERM</b>	The OBS TERM as assigned by Logician.
<b>TYPE</b>	<p>The type of data this code holds. Valid choices include:</p> <ul style="list-style-type: none"> <li>• <b>Date</b> - Vaccination date. This field is required to add a vaccination in IWeb.</li> <li>• <b>MVX</b> - Manufacturer code.</li> <li>• <b>BYID</b> - Vaccinator ID.</li> <li>• <b>BYNAME</b> - Vaccinator name.</li> <li>• <b>LOT</b> - Manufacturer lot number.</li> <li>• <b>MVX</b> - Manufacturer MVX code.</li> <li>• <b>ROUTE</b> - Route of administration.</li> <li>• <b>SITE</b> - Site of administration (on the body).</li> <li>• <b>HIST</b> - Vaccination not administered here.</li> <li>• <b>VACCVFC</b> - Vaccination VFC status.</li> <li>• <b>ATID</b> - Facility where the vaccination was given.</li> <li>• <b>EXP</b> - Expiration date, not used.</li> <li>• <b>VACCTYPE</b> - Vaccination was publicly or privately supplied.</li> <li>• <b>ACTION</b> - Vaccination was added, updated, or deleted.</li> </ul>
<b>CPT</b>	The code imported into IWeb. If no code is specified, then it's not added to the XML.
<b>DOSE</b>	The dose number this code belongs to. Although not imported into IWeb, it's important to know which dose number a code refers to so it can be distinguished when multiple doses are sent together. This is required.
<b>OBS ID</b>	Another internal representation of the OBS CODE. Both codes are sent in HL7 messages, but IWeb only reads the OBS ID. Logician users only see the OBS CODE.
<b>DESCRIPTION</b>	A short description of the code.
<b>ADDITIONAL DESCRIPTION</b>	A longer description of the same code.

2. When you are ready to extract the information, switch to the XML worksheet and copy the contents in Column A.
3. Paste the information in the import profile (**Import Profiles > Select Import Profile > Edit > HL7 Observation Settings (ORU Only)** section > **Observation definition** field).

## Exporting Logician Data

The Logician administrator configures the interface and specifies a flowsheet that lists all the codes to be exported. This flowsheet contains the immunization codes they use and corresponds to the XML you created.

Logician data is exported using the LabLink interface in LinkLogic. Data can be sent via TCP/IP (MLLP) or saved to a file. The HL7 Bridge can be configured to accept the data by TCP/IP or file.



# Glossary

## C

**CRA:** The CDC's Countermeasure and Response Administration system.

## D

**Deduplication:** A compression method used to remove duplicate data.

## E

**EHR:** Electronic Health Record

## H

**HL7:** Health Level 7

## I

**IIS:** Immunization Information System

**IMS:** Immunization Management System

**iQ:** An STC application that allows state and provider level users to monitor the quality of HL7 message data sent to the IIS.

**IRMS:** Information Request Management System

**IWeb:** An STC application that provides immunization resource management and administration tools to track patients, entry of demographic and vaccination information, recruitment progress of potential registry providers, and the ability to generate reports. See <http://www.stchome.com/iweb/>

## L

**LHJ:** Local Health Jurisdiction

## M

**MI / MISA:** Mass Immunization / Mass Immunization Stand Alone

**MRN:** Medical Record Number

**MSH-15:** An HL7 message accept acknowledgement type

**MSH-16:** An HL7 application acknowledgement type

## N

**NDC:** National Drug Code

**NPI:** National Provider Identifier

## P

**PHC-Hub:** An STC application that facilitates the integration between healthcare provider systems and Immunization Information Systems (IIS) by managing HL7 message processing. See <http://www.stchome.com/phc-hub/>

## S

**SIF:** Schools Interoperability Framework

**SMaRT AFIX:** An STC application that provides a uniform, standard user interface for provider-level assessment activities for children and adolescents.

**STC:** Scientific Technologies Corporation (<https://www.stchome.com>)

## V

**VACMAN:** VACcine MANagement software

**VFC:** Vaccines for Children

**VIS:** Vaccine Information Sheet

**VOMS:** Vaccine Ordering Management System

**VTrckS:** Vaccine Tracking System (Centers for Disease Control and Prevention)

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