Informatica® Cloud Application Integration
July 2024

Convert Electronic Health Information from HL7 to FHIR

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Preface

Use *Convert Electronic Health Information from HL7 to FHIR* to learn how to use and configure the recipes that convert HL7 2.x messages to FHIR bundles.

Convert electronic health information from HL7 to FHIR overview

Industry solutions for healthcare and life sciences include recipes that convert HL7 2.x messages to FHIR R4 bundles to enable interoperability between systems that use different healthcare standards. For example, you can convert patient registration data in an HL7 message to a FHIR bundle so that an application on the FHIR standard can use the data.

You can use the following industry solutions recipes to exchange electronic health information from HL7 to FHIR:

- Convert patient admission data from HL7 ADT A01 to FHIR R4
- Convert patient registration data from HL7 ADT A04 to FHIR R4
- Convert patient update information from HL7 ADT A08 to FHIR R4
- Convert laboratory order data from HL7 OML O21 to FHIR R4
- Convert general order entry data from HL7 ORM O01 to FHIR R4
- Convert unsolicitated observation result data from HL7 ORU R01 to FHIR R4
- Convert unsolicitated vaccination update data from HL7 VXU V04 to FHIR R4

Watch an interactive demo to know more about how to use this recipe.

Example

A doctor orders lab work for a patient and the event generates an ORM message in the practice's EMR system using the HL7 2.x standard. The patient must be transferred to a lab outside of the practice that operates solely on the FHIR R4 standard. To exchange data between the practice and the lab, you can use an industry solutions recipe to convert the HL7 ORM message to a FHIR bundle.

Recipe contents

Each recipe contains a process and the assets that the process requires, such as process objects, service connectors, and app connections.

The following image shows the assets that each recipe contains:

The name of the process reflects the HL7 message type that you use as an input to the recipe. For example, the "Convert patient admission data from HL7 ADT A01 to FHIR R4" recipe uses a process named HL7_ADTA01_to_FHIR_R4.

The following table describes the assets:

Asset name	Asset type	Description
payloadObject	Process object	Populates the input payload to send a REST API request to the FHIR server.
ports	Process object	Defines fields in the payload process object.
ConnectionForDataServiceAPIServiceConnector	App connection	Contains the metadata that the `services` resource from the Data Integration REST API requires to run a data service from the data services repository.
AppConnectionforFHIR	App connection	Contains the metadata to connect to the FHIR server.
FHIR_Connector	Service connector	Sends a REST API request to post the FHIR bundle to the FHIR server.
DataServiceAPIServiceConnector	Service connector	Uses the `services` resource from the Data Integration REST API to run a data service from the data services repository.
HL7_to_FHIR_R4*	Process	Converts an HL7 message to a FHIR bundle and sends a REST API request to post the bundle to the FHIR server.
The process name contains a different HL7 message type based on the recipe. For example, the "Convert patient admission data from HL7 ADT A01 to FHIR R4" recipe contains a process called HL7_ADTA01_to_FHIR_R4.		

HL7 2.x to FHIR R4 process

The HL7 2.x to FHIR R4 process converts an HL7 message to a FHIR bundle and posts it to the FHIR server. Each recipe accepts a different HL7 message type as input to the process, such as an HL7 ADT A01 message for the recipe that converts patient admission data.

The process translates health information from HL7 2.x into the FHIR R4 standard. It parses the HL7 message and mapping segments, such as MSH (Message Header), PID (Patient Identification), and PV1 (Patient Visit) to the corresponding FHIR resources, such as MessageHeader, Patient, and Encounter. Then, it uses the resources to create a FHIR bundle, validate it, and transmit it to the FHIR server.

The following image shows the steps that the process contains:

The following table describes the steps in the process:

Step name	Description
Start	Starts the process.
Login	Logs in to Informatica Intelligent Cloud Services.
Invoke HL7 Parser	Invokes the HL7 parser data service from the data services repository.
Checks for HL7 Validation Errors	Checks the output of the HL7 parser data service. If the output contains validation errors, the process ends. Otherwise, the process continues to the next step.
Parsed HL7 XML Output	Assigns the values in the response payload of the HL7 parser data service to value, type, output, and message fields.
HL7 to FHIR Mapping Service	Invokes the HL7 to FHIR mapper data service from the data services repository.
Output FHIR Bundle	Assigns the values in the response payload of the HL7 to FHIR mapper data service to value and message fields.
FHIR Validator Service	Invokes the FHIR validation service from the data services repository to validate the FHIR bundle.
Checks for FHIR Validation Errors	Checks the output of the FHIR validation service. If the output contains validation errors, the process ends. Otherwise, the process continues to the next step.
Post to FHIR Server	Posts the FHIR bundle to the FHIR server.
Assignment to FHIR_Response	Gets the response from the FHIR server. You can view the response code in the Application Integration Console to verify that the bundle was posted to the FHIR server successfully.
Logout	Logs out of Informatica Intelligent Cloud Services.
End	Ends the process.

CHAPTER 2

Using the HL7 2.x to FHIR R4 recipes

To use the HL7 2.x to FHIR R4 recipes, copy the recipe and configure and publish each asset. Then run the process and verify the response from the FHIR server.

Complete the following tasks:

1. Copy and access the recipe.
2. Configure and publish the data service API service connector.
3. Configure and publish the FHIR service connector.
4. Configure and publish the data service API app connection.
5. Configure and publish the FHIR app connection.
6. Publish the process.
7. Run the process.
8. Verify the response from the FHIR server.

Step 1. Copy and access the recipe

Copy the recipe to add the assets to your organization.

1. On the **Recipes** page, search for the recipe that you want to use.
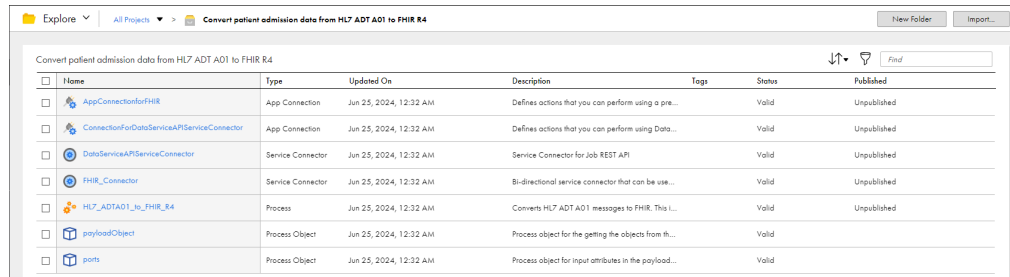
   You can use the following recipes:

   - Convert patient admission data from HL7 ADT A01 to FHIR R4
   - Convert patient registration data from HL7 ADT A04 to FHIR R4
   - Convert patient update information from HL7 ADT A08 to FHIR R4
   - Convert laboratory order data from HL7 OML O21 to FHIR R4
   - Convert general order entry data from HL7 ORM O01 to FHIR R4
   - Convert unsolicitated observation result data from HL7 ORU R01 to FHIR R4
   - Convert unsolicitated vaccination update data from HL7 VXU V04 to FHIR R4

2. Open the recipe and click **Use**.
3. Select the location where you want to copy the recipe, and then click **Continue**.
4. In the **Copying the recipe** dialog box, click **OK**.

It might take some time to copy the recipe. A notification appears when the recipe is ready for use.

5. Click **Explore** to access the recipe content.

6. Navigate to the project or folder where you copied the recipe or enter the recipe name in the **Find** box.

   The following image shows the assets in the recipe:

Step 2. Configure and publish the data service API service connector

Configure the service connector for the data service API to specify the URL for each action. Then publish the asset.

1. Open the **DataServiceAPIServiceConnector** service connector.

2. On the **Actions tab**, edit the **Binding** properties for each action and enter the URL.

   a. Select the **Login** action and enter the POD URL in the format `https://<POD URL>/ma/api/v2/user/login`, such as `https://dm-us.informaticacloud.com/ma/api/v2/user/login`.

   b. Select the **Invoke_Data_Service_API** action and enter the CVM URL in the format `https://<CVM URL>/DSRepo/rest/api/v1/services/run/{$serviceName}`, such as `https://usw1-cvm.dm-staging.informaticacloud/DSRepo/rest/api/v1/services/run/{$serviceName}`.

   c. Select the **Logout** action and enter the POD URL in the format `https://<POD URL>/saas/public/core/v3/logout`, such as `https://dm-us.informaticacloud.com/saas/public/core/v3/logout`.

   For a complete list of POD URLs, see POD Availability and Networking on the Informatica Documentation Portal.

3. Save, test, and publish the service connector.

Step 3. Configure and publish the FHIR service connector

Configure the FHIR service connector to specify the host name and port of the FHIR server. Then publish the asset.

1. Open the **FHIR_Connector** service connector.

2. On the **Definition tab**, edit the values in the **Test With** column of the connection properties and enter the host and port name of the FHIR server.

3. Save, test, and publish the service connector.

Step 4. Configure and publish the data service API app connection

Configure the data service API app connection to specify the runtime environment and then publish the asset.

1. Open the **ConnectionForDataServiceAPIServiceConnector** app connection.
2. From the **Run On** list, select the Secure Agent.
3. In the **Connection Properties** section, enter values for the following properties:

Property	Description
UserName	The user name to log in to Informatica Intelligent Cloud Services.
Password	The password to log in to Informatica Intelligent Cloud Services.

4. Save, test, and publish the app connection.

Step 5. Configure and publish the FHIR app connection

Configure the FHIR app connection to specify the runtime environment and the host name and port for the FHIR server. Then publish the asset.

1. Open the **AppConnectionforFHIR** app connection.
2. On the **Properties tab**, edit the **Run On** field and select the runtime environment.
3. In the connection properties, edit the values of the host name and port of the FHIR server.
4. Save, test, and publish the app connection.

Step 6. Publish the process

Publish the process so you can run it to convert an HL7 message to a FHIR bundle.

1. Open the HL7 2.x to FHIR R4 process based on the recipe that you copied.
2. Save and publish the process.

Step 7. Run the process

Run the process to convert an HL7 message to a FHIR bundle and post it to a FHIR server.

1. Open the HL7 2.x to FHIR R4 process.

2. In the **Actions** menu, click **Run Using**.

3. In the **Process Input** section, edit the payload to specify the agent group ID, HL7 file path, FHIR server base URL, and the username and password to log in to Informatica Intelligent Cloud Services.

    Optionally, you can change the additional outputs to write the errors and errors found as a buffer or to a file. If you write the additional outputs to a file, add a `value` attribute and specify the file path. You can also specify whether you want to process the HL7 data as a message or as a transaction.

    For example, the following payload includes placeholder values:

    ```
    {
        "payload": {
            "Agent_Group_ID": "<Agent Group ID>",
            "Input":{
            "type": "FILE",
            "value": "<HL7 file path like /data/podDataSets/ADT_A01_v26_s4.txt>"
        },
            "Output": {
                "type": "BUFFER"
            },
            "Additional_Inputs": [],
            "Additional_Outputs": [
                {
                    "name": "Errors",
                    "type": "BUFFER" // Specify BUFFER or FILE
                },
                {
                    "name": "ErrorsFound",
                    "type": "BUFFER" // Specify BUFFER or FILE
                }
            ],
            "Service_Parameters": [

                {
                    "name": "util_infaBaseURL",
                    "value": "<FHIR server base URL like http://<host>:<port>/fhir/>"
                },
                {
                    "name": "SM_MSH_Bundle_type",
                    "value": "transaction" // Specify message or transaction
                }
            ]
        },
        "inputUsername":"<Username>",
        "inputPassword":"<Password>"
    }
    ```

4. Click **Run**.

Step 8. Verify the response code from the FHIR server

Open the HL7 2.x to FHIR R4 process in the Application Integration Console and verify the response code that Application Integration receives from the FHIR server.

1. In the Application Integration Console, open the **Processes** page.

2. Select the HL7 2.x to FHIR R4 process.

3. Select **Assignment to FHIR_Response** in the log list.

4. Verify the response code in the **FHIR_Response** field.