



# Red Hat Fuse 7.13

## Designing APIs

Design REST APIs for Fuse applications on OpenShift



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## Abstract

Guide to using the web-based REST API Designer

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## MAKING OPEN SOURCE MORE INCLUSIVE

Red Hat is committed to replacing problematic language in our code, documentation, and web properties. We are beginning with these four terms: master, slave, blacklist, and whitelist. Because of the enormity of this endeavor, these changes will be implemented gradually over several upcoming releases. For more details, see our [CTO Chris Wright's message](#).

## CHAPTER 1. OVERVIEW OF THE API DESIGNER

Red Hat Fuse on OpenShift provides API Designer, a web-based API editor, that you can use to design REST APIs that comply with the [OpenAPI specification](#) (versions 3 or 2), a vendor-neutral and portable open description format for API services. API Designer is a “light” version of the Apicurio Studio open source project (<https://www.apicur.io/>). This means that your API Designer sessions are stateless and you must save your API definition as a JSON file at the end of each session.

You can also use API Designer to generate a preliminary Fuse project based on a REST API definition. In your Fuse development environment, you can then complete the project’s Camel routes and build the project. Finally, you can deploy the resulting REST service on Fuse on OpenShift.

Here is an overview of how you can use API Designer to incorporate REST APIs in your Fuse on OpenShift application solution:

1. Add API Designer as a service to your OpenShift project.
2. In API Designer:
  - Create an API definition with API Designer. Save the REST API definition as a JSON file to your local file system. You can save your API definition at any point during your editing session, even if the API definition is not complete.
  - Upload an API definition to API Designer.
  - Generate a Fuse Camel project based on the current REST API definition. API Designer provides a downloadable zip file that contains a complete Maven project.
3. In your Fuse development environment, complete the skeleton implementation provided by the generated Fuse project.
4. Build and deploy the Fuse application to OpenShift.
5. (Optional) Integrate the Fuse application with Red Hat 3scale API Management, using the 3scale service discovery capability to find and configure your Fuse application.



## CHAPTER 2. ADDING API DESIGNER AS A SERVICE TO YOUR OPENSIFT CLUSTER

### 2.1. ADDING API DESIGNER AS A SERVICE TO AN OPENSIFT 4 PROJECT

For OpenShift 4.x, you need to verify that your OpenShift administrator has installed the API Designer operator in your project as described in the [Fuse on OpenShift Guide](#).

Optionally, the OpenShift administrator might have also added the API Designer as a service to the project. If not, you must do that task.



#### NOTE

A previous name for API Designer, **Apicurito**, is still visible in the API Designer operator's interface.

#### Prerequisite

Your OpenShift administrator has installed the API Designer operator in your OpenShift project.

#### Procedure

1. In your web browser, open the OpenShift console and log in with your credentials (for example, username **developer** and password **developer**).
2. Select the project that includes the API Designer operator.
3. Select **Topology** and verify that you see an icon that is labeled **fuse-apicurito**.  
If there are icons for **apicurito-service-ui** and **apicurito-service-generator** then your OpenShift administrator already added the API Designer as a service to the project and you can skip the rest of these steps.  
  
If there are no icons for **apicurito-service-ui** and **apicurito-service-generator**, continue to the next step.
4. In the left navigation pane, click **Add+**.
5. Under the **Developer Catalog** section, click **Operator Backed**.
6. In the search field, type **Apicurito** to filter the catalog items.
7. Click the **Apicurito provided by Red Hat** card.
8. Click **Create**.  
A default form with a minimal starting template for the API Designer instance opens. Accept the default values or, optionally, edit them.
9. Click **Create** to trigger the start up of the pods, services, and other components of the new API Designer instance.
10. To verify that the API Designer service is added to the project, select **Topology** and then confirm that you see icons for **apicurito-service-ui** and **apicurito-service-generator**.

11. To open the API designer, click the URL link on the **apicurito-service-ui** icon.

## 2.2. ADDING API DESIGNER AS A SERVICE TO AN OPENSIFT 3.11 PROJECT

You can add API Designer as a service to your OpenShift 3.11 project by deploying the API Designer template from the command line.

### Prerequisites

- Obtain the hostname that will allow you to access API Designer by following the guidelines recommended by your OpenShift system administrator.
- Verify that the Fuse on OpenShift images and templates, including **apidesigner-ui** and **fuse-apidesigner-generator**, are installed on your OpenShift cluster, by running the following command in a command window:

```
oc get is -n openshift
```

If the images and templates are not pre-installed, or if the provided versions are out of date, install (or update) the Fuse on OpenShift images and templates as described in the [Fuse on OpenShift Guide](#).

### Procedure

To add the API Designer service from the command line:

1. In a command window, log in to the OpenShift server:

```
oc login -u developer -p developer
```

2. Create a new project namespace. For example, the following command creates a new project named **myproject**:

```
oc new-project myproject
```

3. Create a new application based on the API Designer template by running the following command (where **myproject** is the name of your project):

```
oc new-app -n myproject -f https://raw.githubusercontent.com/jboss-fuse/application-templates/application-templates-2.1.0.fuse-7_13_0-00014-redhat-00001/fuse-apicurito.yml -p ROUTE_HOSTNAME=myhost
```

**Note:** Optionally, you can specify other template parameters by appending additional **-p** options to the **oc new-app** command. For example, if you installed the Fuse on OpenShift images and templates in a namespace other than the default **openshift** namespace, you can set the **IMAGE\_STREAM\_NAMESPACE** to specify the namespace in which the Fuse image streams are installed:

```
oc new-app -n myproject -f https://raw.githubusercontent.com/jboss-fuse/application-templates/application-templates-2.1.0.fuse-7_13_0-00014-redhat-00001/fuse-apicurito.yml -p ROUTE_HOSTNAME=myhost -p IMAGE_STREAM_NAMESPACE=othernamespace
```

4. Obtain the status and the URL of your API Designer deployment by running this command:

**|** oc status

If the API Designer is not deployed, run the following command to verify that you installed the correct versions of the **apicurito-ui** and **fuse-apicurito-generator** images:

**|** oc get is -n openshift | grep "apicurito"

5. To access the API Designer from a browser, use the provided URL (for example, <https://apicurito.192.168.64.12.nip.io>).

## CHAPTER 3. DESIGNING AND DEVELOPING AN API DEFINITION WITH API DESIGNER

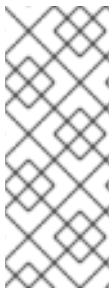
You can use API Designer to design and develop a REST API definition that complies with the OpenAPI 3 (or 2) specification.

### Prerequisites

- You created an OpenShift project.
- You added the API Designer service to your OpenShift project.

### 3.1. CREATING A REST API DEFINITION IN API DESIGNER

The following steps describe how to create a REST API definition.



#### NOTE

- You can access the API Designer user interface from Fuse Online or Fuse on OpenShift.
- For Fuse on OpenShift only, API Designer is stateless which means that it does not save your work between OpenShift sessions. You need to save the API to your local file system between sessions.

#### About the example

The Task Management API example simulates a simple API that sales consultants might use to track the tasks that they need to do when interacting with customer contacts. Example "to-do" tasks might be "create an account for a new contact" or "place an order for an existing contact". To implement the Task Management API example, you create two paths - one for tasks and one for a specific task. You then define operations to create a task, retrieve all tasks or a specific task, update a task, and delete a task.

### Prerequisites

- You know the endpoints for the API that you want to create. For the Task Management API example, there are two endpoints: **/todo** and **/todo/{id}**.
- For Fuse on OpenShift only, you created an OpenShift project and you added the API Designer service to your OpenShift project.

### Procedure

1. If you are using Fuse Online, skip to step 2.  
If you are using Fuse on OpenShift:
  - a. Log in to your OpenShift web console and then open the project that contains API Designer.
  - b. For OpenShift 4.x, select **Topology** and then click the URL link on the **apicurito-service-ui** icon.  
For OpenShift 3.11, from the list of applications, click the URL for API Designer, for example **<https://apidesigner-myproject.192.168.64.43.nip.io>**

A new browser window or tab opens for API Designer.



#### NOTE

Because API Designer is a “light” version of the [Apicurio Studio open source project](#), “Apicurio” shows in the API Designer interface.

2. Click **New API**. A new API page opens.


By default, API Designer uses the OpenAPI 3 specification. If you want to use the OpenAPI 2 specification, click the arrow next to the **New API** button and then select **OpenAPI 2**.



#### NOTE

If you open an API based on the OpenAPI 2 specification, you can use the API Designer’s **Convert to OpenAPI 3** option to convert the API to comply with the OpenAPI 3 specification.

3. To change the API name:

- a. Hover the cursor over the name and then click the edit icon (  ) that appears.
- b. Edit the name. For example, type **Task API**.
- c. Click the checkmark icon to confirm the name change.

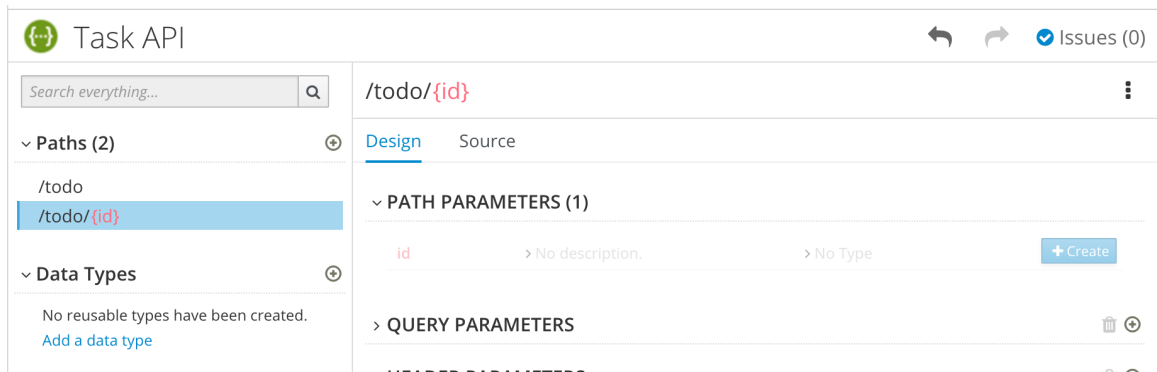
4. Optionally:

- Provide a version number and a description.
- Add your contact information (name, email address, and URL).
- Select a license.
- Define tags.
- Define one or more servers.
- Configure a security scheme.
- Specify security requirements.

5. Define a relative path to each individual endpoint of the API. The field name must begin with a slash (/).

For the Task Management API example, create two paths:

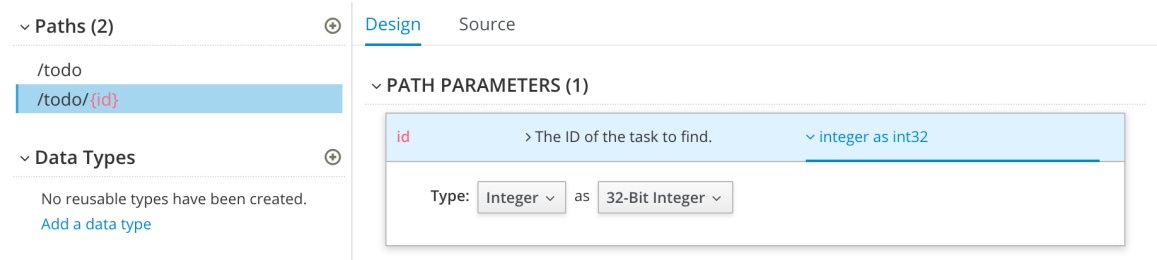
- A path for tasks: **/todo**
- A path for a specific task by ID: **/todo/{id}**



6. Specify the type of any path parameters.

For the example **id** parameter:

- a. In the **Paths** list, click **/todo/{id}**.  
The **id** parameter appears in the **PATH PARAMETERS** section.
- b. Click **Create**.
- c. For the description, type: **The ID of the task to find**.
- d. For the type, select **integer** as **32-Bit integer**.



7. In the **Data Types** section, define reusable types for the API.

- a. Click **Add a data type**
- b. In the **Add Data Type** dialog, type a name. For the Task Management API example, type **Todo**.
- c. Optionally, you can provide an example from which API Designer creates the data type's schema. You can then edit the generated schema.  
For the Task Management API example, start with the following JSON example:

```
{
  "id": 1,
  "task": "my task",
  "completed": false
}
```

- d. Optionally, you can choose to create a REST Resource with the data type.
- e. Click **Save**. If you provided an example, API Designer generates a schema from the example:

8. Optionally, you can add edit the schema properties and add new ones.
9. For the Task Management API example, create another data type named **Task** with one property named **task** of type **string**.

10. For each path, define operations (GET, PUT, POST, DELETE, OPTIONS, HEAD, or PATCH). For the Task Management API example, define the operations as described in the following table:

**Table 3.1. Task Management API operations**

Path	Operation	Description	Request Body	Response
<b>/todo</b>	<b>POST</b>	Create a new task.	Media Type: <b>application/json</b> Data Type: <b>Task</b>	<ul style="list-style-type: none"> <li>• Status Code: <b>201</b></li> <li>Description: <b>Task created</b></li> <li>Response Body: Media Type: <b>application/json</b></li> <li>Data Type: <b>Todo</b></li> </ul>

Path	Operation	Description	Request Body	Response
<b>/todo</b>	<b>GET</b>	Get all tasks.	<i>Not applicable</i>	<ul style="list-style-type: none"> <li>Status Code: <b>200</b> Description: <b>List of Tasks</b></li> </ul>
<b>/todo/{id}</b>	<b>GET</b>	Get a task by ID.	<i>Not applicable</i>	<ul style="list-style-type: none"> <li>Status Code: <b>200</b> Description: <b>Task found for ID</b> Response Body: Media Type: <b>application/json</b> Data type: <b>Task</b></li> <li>Status Code: <b>404</b> Description: <b>No task with provided identifier found.</b></li> </ul>
<b>/todo/{id}</b>	<b>PUT</b>	Update a task by ID.	Request Body type: <b>Task</b>	<ul style="list-style-type: none"> <li>Status Code: <b>200</b> Description: <b>Completed</b></li> <li>Status Code: <b>400</b> Description: <b>Task not updated</b></li> </ul>
<b>/todo/{id}</b>	<b>DELETE</b>	Delete a task by ID.	<i>Not applicable</i>	<ul style="list-style-type: none"> <li>Status Code: <b>200</b> Description: <b>Task deleted</b></li> <li>Status Code: <b>400</b> Description: <b>Task not deleted</b></li> </ul>

11. Resolve any issues, as described in [Resolving validation issues in API Designer](#) .



- For Fuse on OpenShift only, save your API specification by clicking **Save As** and then select **JSON** or **YAML** format.  
The JSON or YAML file is downloaded to your local download folder. The default filename is **openapi-spec** with the appropriate file extension.

### Additional resources

- For information about the OpenAPI Specification, go to: <https://github.com/OAI/OpenAPI-Specification>

## 3.2. RESOLVING VALIDATION ISSUES IN API DESIGNER

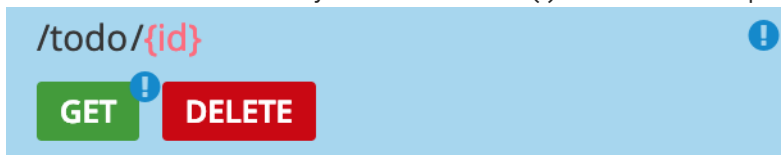
When you create and edit an API, API Designer identifies issues that you must resolve with an exclamation (!) icon and also with a list of issues in the API Designer title bar.

### Prerequisites

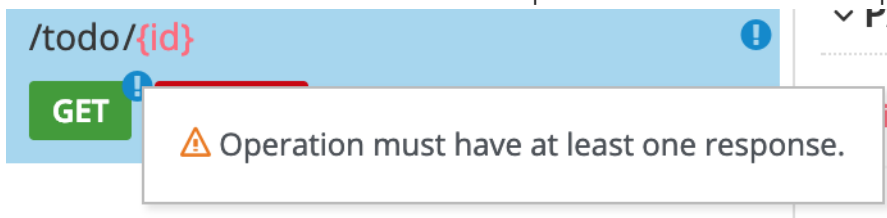
- Open an API in API Designer.

### Procedure

- Find an issue indicated by an exclamation (!) icon. For example:



- Click the exclamation icon to view a description of the issue. For example:



- Based on the information provided by the issue description, navigate to the location of the issue and fix it.

For example, to fix the "Operation must have at least one response" issue, click the **GET** operation to open it and then click **Add a response**.

/todo/{id} GET

Design Source

> INFO

▼ PATH PARAMETERS (1)

id	The unique identifier of the task	integer	Override
----	-----------------------------------	---------	----------

> REQUEST BODY

> QUERY PARAMETERS

▼ RESPONSES

⚠ No responses have been defined. [Add a response](#)

After you type a description for the response, the issue is resolved and the exclamation icon disappears:

TaskAPI Issues (0)

Search everything... Q

▼ Paths (2)

- /todo
- /todo/{id} GET DELETE

▼ Data Types (2)

- </> Task
- </> Todo

/todo/{id} GET

Design Source

id	The unique identifier of the task	integer	Override
----	-----------------------------------	---------	----------

> REQUEST BODY

> QUERY PARAMETERS

▼ RESPONSES (1)

201 Created	Task created.	No Type
-------------	---------------	---------

Description  
Task created.

Issues (3)

4. For a summary of all issues:

a. Click the **Issues** link in the upper right corner.




TaskAPI Issues (3)

b. Click **Go to a problem** for a specific issue to go to the location of the issue so that you can resolve it.

**! Issues (3)**

## Validation Problems



-  **Operation must have at least one response.**  
When declaring an Operation (e.g. GET, PUT, POST, etc...) at least one Response MUST be included. Typically at least a 20x (success) response should be defined.  
[Go to problem](#)
- 
-  **Operation must have at least one response.**  
When declaring an Operation (e.g. GET, PUT, POST, etc...) at least one Response MUST be included. Typically at least a 20x (success) response should be defined.  
[Go to problem](#)
- 
-  **Response is missing a description.**  
Every Response (in each Operation) must have a description. Please make sure to add a helpful description to your Responses.  
[Go to problem](#)

## CHAPTER 4. IMPLEMENTING, BUILDING, AND DEPLOYING A FUSE APPLICATION BASED ON A REST API

You can use Red Hat Fuse API Designer to generate a Camel Fuse project based on a REST API definition. In your Fuse development environment, you can complete the Camel routes and Rest DSL API. Finally, you can build the project and deploy the resulting application to Fuse on OpenShift.

### Prerequisites

- You have an existing API definition, which complies with the OpenAPI 3 (or 2) specification. For example, an **openapi-spec.json** file that you created with API Designer.
- API Designer is installed and running on your local OpenShift cluster.
- You have an existing OpenShift project with API Designer added as a service.
- You have installed Maven and Red Hat Fuse.

The following topics describe how to implement, build, and deploy a Fuse application based on a REST API:

- [Section 4.1, "Uploading an API definition to API Designer"](#)
- [Section 4.2, "Generating a Fuse Camel project from API Designer"](#)
- [Section 4.3, "Completing the API Designer-generated Camel project"](#)
- [Section 4.4, "Building and deploying a REST service"](#)

### 4.1. UPLOADING AN API DEFINITION TO API DESIGNER

You can upload an existing API definition to API Designer.

#### Prerequisites

- You have an existing API definition, which complies with the OpenAPI 3 (or 2) specification. For example, an **openapi.json** file that you created with API Designer.
- API Designer is installed and running on your local OpenShift cluster.
- You have an existing OpenShift project with API Designer added as an application.

#### Procedure

1. In your OpenShift web console, open the project that contains API Designer.
2. Open the API Designer console. In the list of applications for the project, click the URL under apidesigner. For example: <https://apidesigner-myproject.192.168.64.38.nip.io>  
The API Designer console opens in a separate web browser tab or window.
3. Click **Open API**.  
A file manager window opens.
4. In the file manager window:
  - a. Navigate to the folder that contains the existing OpenAPI definition file, for example

- a. Navigate to the folder that contains the existing OpenAPI definition file, for example, **openapi.json**.
- b. Select the OpenAPI definition file and then click **Open**.  
The OpenAPI definition opens in the API Designer console.

## 4.2. GENERATING A FUSE CAMEL PROJECT FROM API DESIGNER

You can use API Designer to generate a Fuse Camel project based on an API definition.

### Prerequisites

- API Designer is installed and running on your local OpenShift cluster.
- You have an existing OpenShift project with API Designer added as an application.
- You have created or opened an API definition file in the API Designer console.

### Procedure

In the API Designer console:

1. Click **Generate**.
2. Select **Fuse Camel Project** from the drop-down list.

API Designer generates a **camel-project.zip** file and downloads it to your local default download folder.

The zip file contains a Fuse Camel project that provides a default skeleton implementation of the API definition using Camel's Rest DSL and includes all resource operations. The project also includes the original OpenAPI definition file that you used to generate the project.

## 4.3. COMPLETING THE API DESIGNER-GENERATED CAMEL PROJECT

API Designer generates a Fuse project that provides a default skeleton implementation of the API definition using Camel's Rest DSL and covering all resource operations. In your Fuse development environment, you complete the project.

### Prerequisites

- You have a **camel-project.zip** file generated by API Designer.
- (Optional) You have installed Red Hat Developer Studio with Fuse Tooling.

### Procedure

1. Unzip the API Designer-generated **camel-project.zip** file to a temporary folder.
2. Open Red Hat Developer Studio.
3. In Developer Studio, select **File → Import**.
4. In the **Import** dialog, select **Maven → Existing Maven Projects**.
5. Open the project's **camel-context.xml** file in the editor view.

6. Click the **REST** tab to edit the Rest DSL components.  
For information on defining REST services, see the "Defining REST services" section of the [Apache Camel Development Guide](#).  
  
For information on extending JAX-RS endpoints with Swagger support, see the [Apache CXF Development Guide](#).  
  
For information on using the Fuse Tooling REST editor, see the "Viewing and editing Rest DSL components" section of the [Tooling User Guide](#).
7. In the Design tab, edit the Camel routes.  
For information on editing Camel routes, see the "Editing a routing context in the route editor" section of the [Tooling User Guide](#).

## 4.4. BUILDING AND DEPLOYING A REST SERVICE

After you complete the Fuse project, you can build and deploy the project in OpenShift.

### Prerequisites

- You have a complete, error-free Fuse project that defines a REST service.
- You have installed Java 8 JDK (or later) and Maven 3.3.x (or later).

### Procedure

If you have a single-node OpenShift cluster, such as Minishift or the Red Hat Container Development Kit, [installed and running](#), you can deploy your project there.

To deploy this project to a running single-node OpenShift cluster:

1. Log in to your OpenShift cluster:

```
$ oc login -u developer -p developer
```

2. Create a new OpenShift project for the project. For example, the following command creates a new project named **test-deploy**.

```
$ oc new-project test-deploy
```

3. Change the directory to the folder that contains your Fuse Camel project (for example, **myworkspace/camel-project**):

```
$ cd myworkspace/camel-project
```

4. Build and deploy the project to the OpenShift cluster:

```
$ mvn clean fabric8:deploy -Popenshift
```

5. In your browser, open the OpenShift console and navigate to the project (for example, **test-deploy**). Wait until you can see that the pod for the **camel-project** application has started.
6. On the project's **Overview** page, locate the URL for the **camel-project** application. The URL uses this form: [http://camel-project-MY\\_PROJECT\\_NAME.OPENSIFT\\_IP\\_ADDR.nip.io](http://camel-project-MY_PROJECT_NAME.OPENSIFT_IP_ADDR.nip.io).

7. Click the URL to access the service.

## CHAPTER 5. PREPARING AN API SERVICE FOR 3SCALE DISCOVERY

Red Hat 3scale API Management is an offering from Red Hat that enables you to regulate access to API services on the public Internet. The functionality of 3scale includes the ability to enforce service-level agreements (SLAs), manage API versions, provide security and authentication services and more. Fuse supports a *service discovery* feature for 3scale, which makes it easy to discover Fuse services from the 3scale Admin Portal UI. Using service discovery, you can scan for Fuse applications running in the same OpenShift cluster and automatically import the associated API definitions into 3scale.

### Prerequisites

- A Fuse application that provides an API service is deployed and running in OpenShift.
- The Fuse application is annotated with the requisite annotations to make it discoverable by 3scale.



### NOTE

Fuse projects that are generated by API Designer are pre-configured to automatically provide the requisite annotations.

For Fuse projects that are not generated by API Designer, you must configure your project as described in [Adding annotations for Fuse projects that are not generated by API Designer](#).

- The 3scale API Management system is deployed on the *same* OpenShift cluster as the API service that is to be discovered.

For details of the procedure to discover an API service in 3scale, see the service discovery section of the [Red Hat 3scale API Management Admin Portal Guide](#).

### Additional resources

- [Red Hat 3scale API Management product page](#)
- [Red Hat 3scale API Management documentation](#)

## 5.1. ADDING ANNOTATIONS FOR FUSE PROJECTS THAT ARE NOT GENERATED BY API DESIGNER

In order for 3scale to discover an API service, the Fuse application that provides the API service must include Kubernetes Service Annotations that make it discoverable. These annotations are provided by the Service Discovery Enricher which is part of the OpenShift Maven Plugin.

For Apache Camel Rest DSL projects, the OpenShift Maven Plugin runs the Service Discovery Enricher by default.

Fuse projects that are generated by API Designer are pre-configured to automatically provide the required annotations.

### Procedure

For a Fuse Rest DSL project that is not generated by API Designer, configure the project as follows:



1. Edit the Fuse project's **pom.xml** file to include the **openshift-maven-plugin** dependency, as shown in this example:

```
<plugin>
  <groupId>org.jboss.redhat-fuse</groupId>
  <artifactId>openshift-maven-plugin</artifactId>
  <version>${fuse.version}</version>
  <executions>
    <execution>
      <goals>
        <goal>resource</goal>
        <goal>build</goal>
      </goals>
    </execution>
  </executions>
</plugin>
```

The OpenShift Maven Plugin runs the Service Discovery Enricher if certain project-level conditions are met (for example, the project must be a Camel Rest DSL project). You do not need to specify the Service Discovery Enricher as a dependency in the **pom.xml** file, unless you want to customize the enricher's behavior (as described in [Customizing the API service annotation values](#).)

2. In the Fuse Rest DSL project's **camel-context.xml** file, specify the following attributes in the **restConfiguration** element:
  - **scheme**: The scheme part of the URL where the service is hosted. You can specify "http" or "https".
  - **contextPath**: The path part of the URL where the API service is hosted.
  - **apiContextPath**: The path to the location where the API service description document is hosted. You can specify either a relative path if the document is self-hosted or a full URL if the document is hosted externally.

The following excerpt from an example **camel-context.xml** file shows annotation attribute values in the **restConfiguration** element:

```
<?xml version="1.0" encoding="UTF-8"?>
<beans xmlns="http://www.springframework.org/schema/beans"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="
    http://www.springframework.org/schema/beans
    http://www.springframework.org/schema/beans/spring-beans.xsd
    http://camel.apache.org/schema/spring
    http://camel.apache.org/schema/spring/camel-spring.xsd">

  <camelContext xmlns="http://camel.apache.org/schema/spring">
    <restConfiguration component="servlet" scheme="https"
      contextPath="myapi" apiContextPath="myapi/openapi.json"/>
  ...
```

The enricher uses the information provided by these **restConfiguration** element attribute values to create values for the **discovery.3scale.net/scheme**, **discovery.3scale.net/path**, and the **discovery.3scale.net/description-path** annotations, thereby making the project's deployed OpenShift service discoverable by 3scale as described in the see the service discovery section of the [Red Hat 3scale API Management Admin Portal Guide](#).

The enricher adds the following label and annotations to make the service discoverable by 3scale:

- The **discovery.3scale.net** label: By default, the enricher sets this value to "true". 3scale uses this label when it executes the selector definition to find all services that need discovery.
- The following annotations:
  - **discovery.3scale.net/discovery-version**: (optional) The version of the 3scale discovery process. The enricher sets this value to "v1" by default.
  - **discovery.3scale.net/scheme**: The scheme part of the URL where the service is hosted. The enricher uses the default "http" unless you override it in the **restConfiguration** element's **scheme** attribute. The other possible value is "https".
  - **discovery.3scale.net/path**: The path part of the URL where the service is hosted. This annotation is omitted when the path is at root, "/". The enricher gets this value from the **restConfiguration** element's **path** attribute.
  - **discovery.3scale.net/port**: The port of the service. The enricher obtains this value from the Kubernetes service definition, which contains the the port numbers of the services it exposes. If the Kubernetes service definition exposes more than one service, the enricher uses the first port listed.
  - **discovery.3scale.net/description-path**: (optional) The path to the OpenAPI service description document. The enricher gets this value from the **restConfiguration** element's **contextPath** attribute.

You can customize the behavior of the Service Discovery Enricher, as described in [Customizing the API service annotation values](#).

## 5.2. CUSTOMIZING THE API SERVICE ANNOTATION VALUES

The Maven Fabric8 Plugin runs the Fabric8 Service Discovery Enricher by default. The enricher adds annotations to the Fuse Rest DSL project's API service so that the API service is discoverable by 3scale, as described in [Using Service Discovery](#) in the Red Hat 3scale API Management *Admin Portal Guide* guide.

The enricher uses default values for some annotations and obtains values for other annotations from the project's **camel-context.xml** file.

You can override the default values and the values defined in the **camel-context.xml** file by defining values in the Fuse project **pom.xml** file or in a **service.yml** file. (If you define values in both files, the enricher uses the values from the **service.yml** file.) See [Fabric8 Service Discovery Enricher elements](#) for a description of the elements that you can specify for the Fabric8 Service Discovery Enricher.

### Procedure

To specify annotation values in the Fuse project **pom.xml** file:

1. Open your Fuse project's **pom.xml** file in an editor of your choice.
2. Locate the **openshift-maven-plugin** dependency, as shown in this example:

```
<plugin>
  <groupId>org.jboss.redhat-fuse</groupId>
  <artifactId>openshift-maven-plugin</artifactId>
  <version>${fuse.version}</version>
```

```

    <executions>
      <execution>
        <goals>
          <goal>resource</goal>
          <goal>build</goal>
        </goals>
      </execution>
    </executions>
  </plugin>

```

3. Add the Fabric8 Service Discovery Enricher as a dependency to the openshift-maven plugin as shown in the following example.

```

<plugin>
  <groupId>org.jboss.redhat-fuse</groupId>
  <artifactId>openshift-maven-plugin</artifactId>
  <version>${fuse.version}</version>
  <executions>
    <execution>
      <goals>
        <goal>resource</goal>
        <goal>build</goal>
      </goals>
    </execution>
  </executions>
  <dependencies>
    <dependency>
      <groupId>io.acme</groupId>
      <artifactId>myenricher</artifactId>
      <version>1.0</version>
      <configuration>
        <enricher>
          <config>
            <f8-service-discovery>
              <scheme>https</scheme>
              <path>/api</path>
              <descriptionPath>/api/openapi.json</descriptionPath>
            </f8-service-discovery>
          </config>
        </enricher>
      </configuration>
    </dependency>
  </dependencies>
</plugin>

```

4. Save your changes.

Alternatively, you can use a **src/main/fabric8/service.yml** fragment to override the annotation values, as shown in the following example:

```

kind: Service
name:
metadata:
  labels:
    discovery.3scale.net/discoverable : "true"

```

```

annotations:
  discovery.3scale.net/discovery-version : "v1"
  discovery.3scale.net/scheme : "https"
  discovery.3scale.net/path : "/api"
  discovery.3scale.net/port : "443"
  discovery.3scale.net/description-path : "/api/openapi.json"
spec:
  type: LoadBalancer

```

### 5.3. FABRIC8 SERVICE DISCOVERY ENRICHER ELEMENTS

The following table describes the elements that you can specify for the Fabric8 Service Discovery Enricher, if you want to override the default values and the values defined in the **camel-context.xml** file.

You can define these values in the Fuse Rest DSL project's **pom.xml** file or in a **src/main/fabric8/service.yml** file. (If you define values in both files, the enricher uses the values from the **service.yml** file.) See [Customizing the API service annotation values](#) for examples.

Table 5.1. Fabric8 Service Discovery Enricher elements

Element	Description	Default
<b>springDir</b>	The path to the spring configuration directory that contains the <b>camel-context.xml</b> file.	The <b>/src/main/resources/spring</b> path which is used to recognize a Camel Rest DSL project.
<b>scheme</b>	The scheme part of the URL where the service is hosted. You can specify "http" or "https".	http
<b>path</b>	The path part of the URL where the API service is hosted.	
<b>port</b>	The port part of the URL where the API service is hosted.	80
<b>descriptionPath</b>	The path to a location where the API service description document is hosted. You can specify either a relative path if the document is self-hosted or a full URL if the document is hosted externally.	
<b>discoveryVersion</b>	The version of the 3scale discovery implementation.	v1

Element	Description	Default
<b>discoverable</b>	<p>The element that sets the <b>discovery.3scale.net</b> label to either <b>true</b> or <b>false</b>.</p> <p>If set to <b>true</b>, 3scale will try to discover this service.</p> <p>If set to <b>false</b>, 3scale will not try to discover this service.</p> <p>You can use this element as a switch, to temporary turn off 3scale discovery integration by setting it to "false".</p>	<p>If you do not specify a value, the enricher tries to auto-detect whether it can make the service discoverable. If the enricher determines that it cannot make the service discoverable, 3scale will not try to discover this service.</p>