



Red Hat Fuse 7.1

Fuse Online Sample Integration Tutorials

How business users can share data among different applications

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Abstract

Follow step-by-step instructions for creating Fuse Online sample integrations.

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PREFACE

Fuse Online lets you obtain data from an application or service, operate on that data if you need to, and then send the data to a completely different application or service. You can do all this without writing code.

Explore Fuse Online by creating these sample integrations:

- [Chapter 3, *Implement a Twitter to Salesforce sample integration*](#)
- [Chapter 4, *Implement a Salesforce to database sample integration*](#)
- [Chapter 5, *Implement an AMQ to REST API sample integration*](#)

A [user guide](#) for Fuse Online is also available.

To obtain support, in Fuse Online, in the upper right, click  and then select **Support**.

CHAPTER 1. CHOOSE THE SAMPLE INTEGRATION TO CREATE FIRST

You can create the sample integrations in any order. To help you decide which one to try first, the following table compares them.

	Twitter to Salesforce	Salesforce to Database	AMQ to REST API
What it does	Captures and filters tweets that mention a particular Twitter user. For tweets that contain specified text, the integration passes data related to the tweet to Salesforce and Salesforce creates a new contact.	Captures updates in Salesforce and then calls a database stored procedure to synchronize a particular database table with the Salesforce updates.	Obtains delivery records from an AMQ broker, executes a custom step to identify any items that were damaged when they were received, and connects to a REST API to provide contact information for vendors of damaged items.
What you learn about	Connecting to Twitter and Salesforce, how Fuse Online interfaces with applications that use the OAuth protocol, mapping data fields received from one application to fields that the next connected application in the integration can operate on, filtering data to determine whether to continue integration execution.	Connecting to Salesforce and a SQL database, OAuth support, data mapping, how to update a SQL database as part of an integration.	Connecting to an AMQ broker and a REST API, data mapping, uploading extensions for a step and for a REST API client connector, using a custom step and a custom API client connection.
Average minutes to complete	25	20	25
Notes about the time	This includes the time needed to obtain Twitter and Salesforce accounts. It does not include 5 - 12 minutes of waiting for Salesforce registration to take effect and for Fuse Online to start running the integration.	20 minutes includes the time needed to obtain a Salesforce developer account but not the time spent waiting. If you already created the Twitter to Salesforce sample then it takes 10 minutes to create this integration.	This does not include the time it takes for Fuse Online to start running the integration.
Prerequisites	Twitter developer account, Salesforce developer account	Salesforce developer account	None

CHAPTER 2. WHAT TO EXPECT WHEN USING FUSE ONLINE FOR THE FIRST TIME

To use Fuse Online on OpenShift Online, Red Hat provides a link. Clicking this link displays the **Red Hat OpenShift Online Log In** page, which prompts you to log in by using your Red Hat account. Logging in prompts you to authorize Fuse Online to access to your account:

Authorize Access

Service account `syndesis-oauth-client` in project `proj166247` is requesting permission to access your account

Requested permissions



user:info

Read-only access to your user information (including username, identities, and group membership)



user:check-access

Read-only access to view your privileges (for example, "can I create builds?")

You will be redirected to <https://app-proj166247.6a63.fuse-ignite.openshiftapps.com/oauth/callback>

Allow selected permissions

Deny

Click **Allow selected permissions**. You need to do this only once. The next time you click the Fuse Online access link, Fuse Online immediately appears.

To use Fuse Online on OpenShift Container Platform, follow the installation instructions, which are at the end of [Integrating Applications with Fuse Online](#).

Red Hat supports using Fuse Online in the following browsers:

- Chrome
- Firefox
- Microsoft Edge

CHAPTER 3. IMPLEMENT A TWITTER TO SALESFORCE SAMPLE INTEGRATION

This sample integration watches Twitter for tweets that mention a particular Twitter user. When the integration finds such tweets, it filters them so that only those tweets that contain the text you specify cause the integration to continue.

For tweets that contain the specified text, the integration passes data related to the tweet, including the Twitter user name, to Salesforce and Salesforce creates a new contact.

To implement, deploy, and test this sample integration, the main steps are:

1. [Section 3.2, “Register Fuse Online as a Twitter client application”](#)
2. [Section 3.3, “Create a Twitter connection”](#)
3. [Section 3.4, “Register Fuse Online as a Salesforce client application”](#)
4. [Section 3.5, “Create a Salesforce connection”](#)
5. [Section 3.6, “Create and deploy Twitter to Salesforce sample integration”](#)
6. [Section 3.7, “Confirm that the Twitter to Salesforce integration works”](#)
7. [Section 3.8, “Clean up your integration”](#)

Before you implement this sample integration, see [Section 3.1, “Prerequisites for implementing Twitter to Salesforce integration”](#).

3.1. PREREQUISITES FOR IMPLEMENTING TWITTER TO SALESFORCE INTEGRATION

To implement a Twitter to Salesforce sample integration:

- You need a Twitter developer account. If you do not already have one, go to <https://apps.twitter.com>, sign in to Twitter, and click **Apply for a developer account**. Obtaining the developer account is quick when you provide a professional email address, such as `me@redhat.com` rather than a personal address such as `you@gmail.com`.
- You need an account in a Salesforce installation that is used for development. This account must have Salesforce API access, which is available in a Salesforce Enterprise account or a Salesforce Developer account. To obtain a free developer account, visit <https://developer.salesforce.com/signup>. It takes less than two minutes to obtain a Salesforce account.
- You must be logged in to your Fuse Online environment. If you are not already logged in, see [Chapter 2, *What to expect when using Fuse Online for the first time*](#).

3.2. REGISTER FUSE ONLINE AS A TWITTER CLIENT APPLICATION

You must register your Fuse Online environment as a client application that can access Twitter. This lets you create any number of integrations that connect to Twitter. In other words, you need to register a particular Fuse Online environment with Twitter only once.

In each Fuse Online environment, there can be only one registration of Fuse Online as a Twitter client application. However, while each Twitter connection uses the same registration, it can use different user credentials.

Perform these steps:

1. In Fuse Online:
 - a. In the left panel, click **Settings**.
 - b. On the **Settings** page, near the top, to the right of the callback URL, click  to copy the callback URL for your installation of Fuse Online to the clipboard. You will need this URL later in this procedure.
 - c. To the right of the **Twitter** entry, click **Register** to display the **Consumer Key** and **Consumer Secret** fields.
2. In another browser tab, go to your [Twitter developer account](#), sign in if you need to, and do the following:
 - a. In the upper right, next to the name of your developer project, click the down caret and click **Apps**.
 - b. In the upper right, click **Create an app**.
 - c. In the **App name** field, enter a name such as **My Fuse Online Client**.
 - d. In the **Application description** field, enter a tip such as **For leveraging tweets**.
 - e. In the **Website URL** field, paste the URL that you copied at the beginning of this procedure and remove **api/v1/credentials/callback** from the end of the URL.
 - f. Select **Enable Sign in with Twitter**.
 - g. In the **Callback URLs** field, paste the URL again. It should be something like this:
https://app-proj9128.7b63.fuse-ignite.openshiftapps.com/api/v1/credentials/callback.
 - h. A 100-character description of how you plan to use this app is required. For convenience, you can copy and paste: **This is a demo application so that I can evaluate how to integrate Twitter with my enterprise applications**.
 - i. Click **Create**.
 - j. Click **Create** again to confirm that you reviewed the developer terms.
 - k. At the top of the page for the app you just created, click the **Keys and tokens** tab.
 - l. Copy the API key.
3. Return to your Fuse Online **Settings** page and paste the Twitter consumer API key into the Fuse Online Twitter **Consumer Key** field.
4. Return to the Twitter **Keys and tokens** tab and copy the consumer API secret key.
5. Return to your Fuse Online **Settings** page and paste the Twitter consumer API secret key into the Fuse Online Twitter **Consumer Secret** field.

6. Click **Save** and then click **Ok**.

3.3. CREATE A TWITTER CONNECTION

A connection to Twitter requires registration of Fuse Online as an application that can access Twitter. If you did not already register Fuse Online, see [Section 3.2, “Register Fuse Online as a Twitter client application”](#).

After you create a Twitter connection, you can use it in multiple integrations.

To create a Twitter connection:

1. In Fuse Online, in the left panel, click **Connections** to display any available connections.
2. In the upper right, click **Create Connection** to display the available connectors. A connector is a template that you use to create one or more connections.
3. Click the **Twitter** connector.
4. Click **Connect Twitter** to display a Twitter authorization page. You might need to log in to Twitter before you see the authorization page.
5. Click **Authorize app** to return to Fuse Online.
6. In the **Connection Name** field, enter your choice of a name that helps you distinguish this connection from any other connections. For example, enter **Twitter Connect 1**.
7. In the **Description** field, optionally enter any information that is helpful to know about this connection. For example, enter **Sample Twitter connection that uses my Twitter login credentials**.
8. In the upper right, click **Create** to see that the connection you created is now available. If you entered the example name, you would see that **Twitter Connect 1** appears as a connection that you can choose to add to an integration.

3.4. REGISTER FUSE ONLINE AS A SALESFORCE CLIENT APPLICATION

You must register your Fuse Online environment as a client application that can access Salesforce. This lets you create any number of integrations that connect to Salesforce. In other words, you need to register a particular Fuse Online environment with Salesforce only once.

If you already registered Fuse Online as a Salesforce client and created a Salesforce connection, skip to [Section 3.6, “Create and deploy Twitter to Salesforce sample integration”](#).

In each Fuse Online environment, there can be only one registration of Fuse Online as a Salesforce client. However, while each Salesforce connection uses the same registration, it can use different user credentials.

To complete this procedure, you must be logged in to your Fuse Online environment. If you are not already logged in, see [Chapter 2, *What to expect when using Fuse Online for the first time*](#).

Perform these steps to register Fuse Online as a Salesforce client application:

1. In Fuse Online:

- a. In the left panel, click **Settings**.
 - b. On the **Settings** page, near the top, to the right of the callback URL, click  to copy the callback URL for your Fuse Online environment to the clipboard. You will need this URL toward the end of this procedure.
 - c. To the right of the **Salesforce** entry, click **Register** to display the **Client ID** and **Client Secret** fields.
2. In another browser tab, log in to your Salesforce account and follow the steps below to create a connected app. These instructions assume that you are using the Salesforce Classic user interface. To switch from the Salesforce Lightning Experience interface, click your profile icon and select **Switch to Salesforce Classic**. For additional information, see the Salesforce documentation for [Create a Connected App](#).
 - a. In Salesforce, in the upper right, click **Setup**.
 - b. In the left panel, select **Build > Create > Apps**.
 - c. Scroll down to **Connected Apps** and click **New**.
 - d. Enter the required information and then select **Enable OAuth Settings**.
 - e. In the **Callback URL** field, paste your Fuse Online URL, which you copied at the beginning of this procedure. For example: **https://app-proj9128.7b63.fuse-ignite.openshiftapps.com/api/v1/credentials/callback**.
 - f. For **OAuth Scopes**, add:
 - **Access and manage your data (api)**
 - **Allow access to your unique identifier (openid)**
 - **Perform requests on your behalf at any time (refresh_token, offline_access)**
 - g. Select **Configure ID token** and then **Include Standard Claims**.
 - h. Scroll down and click **Save**.
 - i. Scroll up to see that Salesforce indicates a short wait:

New Connected App [Help for this Page](#) 

Allow from 2-10 minutes for your changes to take effect on the server before using the connected app.
 - j. Click **Continue**.
 - k. Copy the consumer key that Salesforce provides.
3. Return to your Fuse Online **Settings** page and paste the Salesforce-provided consumer key into the Fuse Online Salesforce **Client ID** field.
 4. Return to Salesforce and copy the consumer secret that Salesforce provides.
 5. Return to your Fuse Online **Settings** page and paste the Salesforce-provided consumer secret into the Fuse Online Salesforce **Client Secret** field.

- Click **Save** and then click **Ok**.

3.5. CREATE A SALESFORCE CONNECTION

A connection to Salesforce requires registration of Fuse Online as an application that can access Salesforce.

If you did not already register Fuse Online see [Section 3.4, “Register Fuse Online as a Salesforce client application”](#).

Be sure to wait 2 - 10 minutes after registering your Fuse Online installation as a Salesforce client before you try to create a Salesforce connection. After you create a Salesforce connection, you can use it in multiple integrations.

To create a Salesforce connection:

- In Fuse Online, in the left panel, click **Connections** to display available connections.
- In the upper right, click **Create Connection** to display the available connectors. A connector is a template for creating one or more connections.
- Click the **Salesforce** connector.
- Click **Connect Salesforce** to display a Salesforce authorization page. You might need to log in to Salesforce before you see the authorization page.



NOTE

The following error indicates that Salesforce does not have the correct Fuse Online callback URL:

```
error=redirect_uri_mismatch&error_description=redirect_uri%20must%20match%20configuration
```

If you get this error message, then in Salesforce, ensure that the Fuse Online callback URL is specified according to the instructions in [Section 3.4, “Register Fuse Online as a Salesforce client application”](#).

- Click **Allow** to return to Fuse Online.
- In the **Connection Name** field, enter your choice of a name that helps you distinguish this connection from any other connections. For example, enter **SF Connect 1**.
- In the **Description** field, optionally enter any information that is helpful to know about this connection. For example, enter **Sample Salesforce connection that uses my Salesforce login credentials**.
- In the upper right, click **Create** to see that the connection you created is now available. If you entered the example name, you would see that **SF Connect 1** appears as a connection that you can choose to add to an integration.

3.6. CREATE AND DEPLOY TWITTER TO SALESFORCE SAMPLE INTEGRATION

To create and deploy an integration that uses the Twitter and Salesforce connections you created, the main steps are:

- [Section 3.6.1, “Choose the start connection”](#)
- [Section 3.6.2, “Choose the finish connection”](#)
- [Section 3.6.3, “Add a basic filter step”](#)
- [Section 3.6.4, “Add a data mapping step”](#)
- [Section 3.6.5, “Give the integration a name and deploy it”](#)

3.6.1. Choose the start connection

In Fuse Online, to choose the start connection:

1. On the left, click **Integrations**.
2. In the upper right, click **Create Integration**.
3. On the **Choose a Start Connection** page, click the Twitter connection you created. If you gave it the example name, you would click **Twitter Connect 1**. When the integration starts, it uses the credentials defined in this connection to connect to Twitter.
4. On the **Choose an Action** page, click **Mention**.

After connecting to Twitter, the integration monitors Twitter for mentions that include your Twitter screen name. A match triggers the next step in the integration. However, before you add steps that operate on data between connections, you choose the connection that the integration uses to finish its work.

3.6.2. Choose the finish connection

In Fuse Online, to add the finish connection to the integration:

1. On the **Choose a Finish Connection** page, click the Salesforce connection you created. If you gave it the example name, you would click **SF Connect 1**. This integration finishes by using the credentials defined in this connection to connect to Salesforce.
2. On the **Choose an Action** page, click **New record**.
3. On the next page, accept **Contact** as the Salesforce record to create.
4. Click **Done** to add the finish connection to the integration.

3.6.3. Add a basic filter step

Add a basic filter step that checks tweets that mention you for particular content. The integration continues only if that content is present.

In Fuse Online, to add a basic filter step:

1. In the main panel, click **Add a step**.
2. Click **Basic Filter**.

3. In the first field (**The data you want to evaluate**), start to enter **text** and when **text** appears below the field, click it. This indicates that the content to filter for is in the Twitter **text** field, which contains the text of the tweet.
4. Accept **contains** as the condition to be met for the integration to continue.
5. In the last field, enter **#RedHatIsGreat** or some other text you choose. A tweet that mentions you must contain the text you enter here for the integration to continue operating on this data.
6. Click **Done** to complete the basic filter step.

3.6.4. Add a data mapping step

Add a data mapping step that correlates Twitter mention fields to Salesforce contact fields:

1. In Fuse Online, in the left panel, hover over the plus sign between the filter step and the finish connection to display a pop-up in which you click **Add a Step**.
2. Click **Data Mapper** and wait a few moments. When the data fields appear, the **Sources** panel on the left displays the Twitter fields and the **Target** panel on the right displays the Salesforce fields.
3. Map the Twitter **name** field to the Salesforce **FirstName** and **LastName** fields:
 - a. In the **Sources** panel, click the magnifying glass  to display the search field and enter **name**.
 - b. Under the **user** folder, click the **name** field.
 - c. In the **Target** panel, scroll down and click **FirstName**. The data mapper displays a line from the source **name** field to the target **FirstName** field.
 - d. In the **Target** panel, scroll down, hover over **LastName**, and press **CTRL-Mouse1** (**CMD-Mouse1** on MacOS) to select **LastName**. The data mapper displays another line from the Twitter **name** field, but this time it goes to the Salesforce **LastName** field. The blue lines indicate the current focus.
In the **Mapping Details** panel, you can see that the data mapper automatically changed the action from **Map** to **Separate**.
4. Map the Twitter **screenName** field to the Salesforce **Title** field:
 - a. In the **Sources** panel, scroll down to click the **screenName** field.
 - b. On the right, at the top of the **Target** panel, click the magnifying glass  to display the search field and enter **Title**.
 - c. Click the **Title** field. The data mapper displays a line from the Twitter **screenName** field to the Salesforce **Title** field.
5. Map the Twitter **text** field to the Salesforce **Description** field:
 - a. In the **Sources** search field, enter **text** and click the **text** field.
 - b. In the **Target** search field, enter **description**.

c. Click the Salesforce **Description** field to create the mapping.

6. In the upper right, click the grid icon  to display the list of mappings, which should look like this:

 Mappings

 Sources	 Targets	 Type
/user/name	/FirstName ⚡ /LastName ⚡	Separate (Space)
/user/screenName	/Title	Map
/text	/Description	Map

7. In the upper right, click **Done**.

3.6.5. Give the integration a name and deploy it

The sample integration is complete. To deploy it:

1. In Fuse Online, at the top of the left panel, in the **Integration Name** field, enter a name of your choice that distinguishes this integration from any other integrations. For example: **Twitter to Salesforce Sample Integration**.
2. In the upper right corner, click **Publish**.

Fuse Online displays the integration summary page with a progress indicator that shows the publishing stages. Fuse Online is generating the runtime for the integration and will start it when the runtime is ready. This takes a few minutes.



NOTE

A Fuse Online account is limited to a specific number of integrations that can be running at one time. For details, see the pricing plan. If you are already running the maximum number of integrations, then you must stop an integration before you can start running another one.

If you are using a Fuse Online evaluation account, then only one integration at a time can be running. If you already created one of the other sample integrations and that integration is running then this integration is automatically in the **Stopped** state. You must stop the running integration and then you can then publish this integration.

If you are already running the maximum number of integrations, follow these steps to stop an integration:

1. In the left panel, click **Integrations**.
2. In the entry for the integration that you want to stop, click  on the far right.
3. In the popup, click **Stop**.

After stopping an integration, start another integration as follows:

1. In the left panel, click **Integrations**.
2. In the entry for the integration that you want to start, click  on the far right.
3. In the popup, click **Publish**.

3.7. CONFIRM THAT THE TWITTER TO SALESFORCE INTEGRATION WORKS

To confirm that the Twitter to Salesforce sample integration is working:

1. In Fuse Online in the panel on the left, click **Integrations** to see that the integration you created is a **Running** integration. If you entered the example name, you would see that **Twitter to Salesforce Sample Integration** is running.
2. Confirm that the integration does not create a contact record when a tweet does not contain the text you specified in the basic filter step:
 - a. In Twitter, send a tweet that:
 - Mentions your Twitter handle
 - Does not contain the text you specified in the basic filter step
For example: **@Aslan #likesRedHat**.
 - b. Wait for the polling interval to elapse, which can be 30 - 60 seconds.
 - c. In Salesforce, confirm that a contact record with your name does not exist.
3. Confirm that the integration creates a new contact record when it should:
 - a. In Twitter, send a tweet that:
 - Mentions your Twitter handle
 - Contains the text you specified in the basic filter step
For example: **@Aslan knows #RedHatIsGreat**.
 - b. Wait for the polling interval to elapse.
 - c. In Salesforce, locate a contact record that has your name, the text of your tweet in the **Description** field, and your Twitter screen name in the **Title** field.

3.8. CLEAN UP YOUR INTEGRATION

When you are done working with a sample integration, stop it and delete it:

1. In Fuse Online, in the left panel, click **Integrations**.
2. In the main panel, identify the entry for the sample integration that you want to stop.
3. In that entry, to the right, click  and then click **Stop**.
4. Click **Stop** to confirm that you want to stop running the integration.

5. In the entry for the integration that you just stopped, to the right, click  and then click **Delete**.
6. Click **Delete** to confirm that you want to delete the integration.

CHAPTER 4. IMPLEMENT A SALESFORCE TO DATABASE SAMPLE INTEGRATION

This sample integration captures updates in Salesforce and then calls a database stored procedure, which synchronizes that database with the Salesforce updates.

To implement, deploy, and test this sample integration, the main steps are:

1. [Section 4.2, “Register Fuse Online as a Salesforce client application”](#)
2. [Section 4.3, “Create a Salesforce connection”](#)
3. [Section 4.4, “Create and deploy Salesforce to database sample integration”](#)
4. [Section 4.5, “Confirm that the Salesforce to database integration works”](#)
5. [Section 4.6, “Clean up your integration”](#)

If you already created the Twitter to Salesforce sample integration:

- Fuse Online is already registered as a Salesforce client. You do not need to do this again.
- You already have a Salesforce connection, which you can reuse in this sample integration.

If you did not already create the Twitter to Salesforce sample integration, then you must register Fuse Online as a Salesforce client and create a Salesforce connection in order to complete the Salesforce to database sample integration.

Before you implement this sample integration, see [Section 4.1, “Prerequisites for implementing Salesforce to database integration”](#).

4.1. PREREQUISITES FOR IMPLEMENTING SALESFORCE TO DATABASE INTEGRATION

To implement a Salesforce to database sample integration, you need an account in a Salesforce installation that is used for development. This account must have Salesforce API access, which is available in a Salesforce Enterprise account or a Salesforce Developer account. To obtain a free developer account, visit <https://developer.salesforce.com/signup>. It takes less than two minutes to obtain a Salesforce account.

Also, you must be logged in to your Fuse Online environment. If you are not already logged in, see [Chapter 2, *What to expect when using Fuse Online for the first time*](#).

4.2. REGISTER FUSE ONLINE AS A SALESFORCE CLIENT APPLICATION

You must register your Fuse Online environment as a client application that can access Salesforce. This lets you create any number of integrations that connect to Salesforce. In other words, you need to register a particular Fuse Online environment with Salesforce only once.

If you already registered Fuse Online as a Salesforce client and created a Salesforce connection, skip to [Section 4.4, “Create and deploy Salesforce to database sample integration”](#).

In each Fuse Online environment, there can be only one registration of Fuse Online as a Salesforce client. However, while each Salesforce connection uses the same registration, it can use different user credentials.

To complete this procedure, you must be logged in to your Fuse Online environment. If you are not already logged in, see [Chapter 2, What to expect when using Fuse Online for the first time](#).

Perform these steps to register Fuse Online as a Salesforce client application:

1. In Fuse Online:
 - a. In the left panel, click **Settings**.
 - b. On the **Settings** page, near the top, to the right of the callback URL, click  to copy the callback URL for your Fuse Online environment to the clipboard. You will need this URL toward the end of this procedure.
 - c. To the right of the **Salesforce** entry, click **Register** to display the **Client ID** and **Client Secret** fields.
2. In another browser tab, log in to your Salesforce account and follow the steps below to create a connected app. These instructions assume that you are using the Salesforce Classic user interface. To switch from the Salesforce Lightning Experience interface, click your profile icon and select **Switch to Salesforce Classic**. For additional information, see the Salesforce documentation for [Create a Connected App](#).
 - a. In Salesforce, in the upper right, click **Setup**.
 - b. In the left panel, select **Build > Create > Apps**.
 - c. Scroll down to **Connected Apps** and click **New**.
 - d. Enter the required information and then select **Enable OAuth Settings**.
 - e. In the **Callback URL** field, paste your Fuse Online URL, which you copied at the beginning of this procedure. For example: `https://app-proj9128.7b63.fuse-ignite.openshiftapps.com/api/v1/credentials/callback`.
 - f. For **OAuth Scopes**, add:
 - **Access and manage your data (api)**
 - **Allow access to your unique identifier (openid)**
 - **Perform requests on your behalf at any time (refresh_token, offline_access)**
 - g. Select **Configure ID token** and then **Include Standard Claims**.
 - h. Scroll down and click **Save**.
 - i. Scroll up to see that Salesforce indicates a short wait:

New Connected App

[Help for this Page](#) 

Allow from 2-10 minutes for your changes to take effect on the server before using the connected app.

- j. Click **Continue**.
 - k. Copy the consumer key that Salesforce provides.
3. Return to your Fuse Online **Settings** page and paste the Salesforce-provided consumer key into the Fuse Online Salesforce **Client ID** field.
 4. Return to Salesforce and copy the consumer secret that Salesforce provides.
 5. Return to your Fuse Online **Settings** page and paste the Salesforce-provided consumer secret into the Fuse Online Salesforce **Client Secret** field.
 6. Click **Save** and then click **Ok**.

4.3. CREATE A SALESFORCE CONNECTION

A connection to Salesforce requires registration of Fuse Online as an application that can access Salesforce.

If you did not already register Fuse Online, see [Section 4.2, “Register Fuse Online as a Salesforce client application”](#).

Be sure to wait 2 - 10 minutes after registering your Fuse Online installation as a Salesforce client before you try to create a Salesforce connection. After you create a Salesforce connection, you can use it in multiple integrations.

To create a Salesforce connection:

1. In Fuse Online, in the left panel, click **Connections** to display available connections.
2. In the upper right, click **Create Connection** to display the available connectors. A connector is a template for creating one or more connections.
3. Click the **Salesforce** connector.
4. Click **Connect Salesforce** to display a Salesforce authorization page. You might need to log in to Salesforce before you see the authorization page.



NOTE

The following error indicates that Salesforce does not have the correct Fuse Online callback URL:

```
error=redirect_uri_mismatch&error_description=redirect_uri%20must%20match%20configuration
```

If you get this error message, then in Salesforce, ensure that the Fuse Online callback URL is specified according to the instructions in [Section 4.2, “Register Fuse Online as a Salesforce client application”](#).

5. Click **Allow** to return to Fuse Online.
6. In the **Connection Name** field, enter your choice of a name that helps you distinguish this connection from any other connections. For example, enter **SF Connect 1**.

7. In the **Description** field, optionally enter any information that is helpful to know about this connection. For example, enter **Sample Salesforce connection that uses my Salesforce login credentials**.
8. In the upper right, click **Create** to see that the connection you created is now available. If you entered the example name, you would see that **SF Connect 1** appears as a connection that you can choose to add to an integration.

4.4. CREATE AND DEPLOY SALESFORCE TO DATABASE SAMPLE INTEGRATION

To create and deploy an integration that uses the Salesforce connection and the database connection, the main steps are:

- [Section 4.4.1, “Choose the start connection”](#)
- [Section 4.4.2, “Choose the finish connection”](#)
- [Section 4.4.3, “Add a data mapping step”](#)
- [Section 4.4.4, “Give the integration a name and deploy it”](#)

4.4.1. Choose the start connection

To choose the start connection:

1. In Fuse Online, on the left, click **Integrations**.
2. Click **Create Integration**.
3. On the **Choose a Start Connection** page, click your Salesforce connection. If you specified the example name, you would click **SF Connect 1**.
4. On the **Choose an Action** page, click **On create**.
5. In the **Object name** field, select **Lead**.
6. Click **Done** to add the start connection to the integration.

After connecting to Salesforce, the integration watches for notifications that a Salesforce **Lead** record was created. When the integration finds such a notification, it passes the new lead’s data to the next step in the integration.

However, before you can add the next step, you must choose the integration’s finish connection.

4.4.2. Choose the finish connection

To add the finish connection to the integration:

1. In Fuse Online, on the **Choose a Finish Connection** page, click the **PostgresDB** connection. This integration finishes by using the credentials defined in this database connection to connect to the provided sample database.
2. On the **Choose an Action** page, click **Invoke SQL stored procedure**, which passes data to a stored procedure.

3. In the **Procedure Name** field, click and select **add_lead**, which is the provided stored procedure to run in the sample database. The selected procedure determines the requirements for additional steps in the integration, for example, which Salesforce data fields need to be mapped to which database fields.
4. Click **Done** to add the finish connection to the integration.

4.4.3. Add a data mapping step

To add a step that maps Salesforce fields to database fields:

1. In Fuse Online, in the left panel, hover over the plus sign immediately after the start connection to display a pop-up in which you click **Add a Step**.
2. Click **Data Mapper** and wait a few moments. When the data fields appear, the **Sources** panel on the left displays the Salesforce fields and the **Target** panel on the right displays the database fields.
3. Map the Salesforce **Company** field to the database **company** field:
 - a. On the left, in the **Sources** panel, click **Company**.
 - b. On the right, in the **Target** panel, click **company**. The data mapper displays a line from the source field to the target field.
4. Map the **Sources** (Salesforce) **Email** field to the **Target** (database) **email** field.
5. Map two Salesforce fields (**FirstName** and **LastName**) to the database **first_and_last_name** field:
 - a. In the **Target** panel, click **first_and_last_name**.
 - b. In the **Sources** panel, click **FirstName**.
 - c. In the **Sources** panel, hover over **LastName** and press **CTRL-Mouse1** (**CMD-Mouse1** on MacOS).
The data mapper automatically changes the field action from **Map** to **Combine**.

When you are done you should see a line from each of the source fields to the target field.
6. Add the following mappings:

Map This Salesforce Field	To This Database Field
LeadSource	lead_source
Status	lead_status
Phone	phone
Rating	rating

7. In the upper right, click **Done**.

4.4.4. Give the integration a name and deploy it

The sample integration is complete. To deploy it:

1. In Fuse Online, in the upper right, click **Publish** to give it a name.
2. In the **Integration Name** field, enter a name for the integration. For example, **Salesforce to Database Sample Integration**.
3. In the upper right corner, click **Publish**.

Fuse Online displays the integration summary page with a progress indicator that shows the publishing stages. Fuse Online is generating the runtime for the integration and will start it when the runtime is ready. This takes a few minutes.



NOTE

A Fuse Online account is limited to a specific number of integrations that can be running at one time. For details, see the pricing plan. If you are already running the maximum number of integrations, then you must stop an integration before you can start running another one.

If you are using a Fuse Online evaluation account, then only one integration at a time can be running. If you already created one of the other sample integrations and that integration is running then this integration is automatically in the **Stopped** state. You must stop the running integration and then you can then publish this integration.

If you are already running the maximum number of integrations, follow these steps to stop an integration:

1. In the left panel, click **Integrations**.
2. In the entry for the integration that you want to stop, click  on the far right.
3. In the popup, click **Stop**.

After stopping an integration, start another integration as follows:

1. In the left panel, click **Integrations**.
2. In the entry for the integration that you want to start, click  on the far right.
3. In the popup, click **Publish**.

4.5. CONFIRM THAT THE SALESFORCE TO DATABASE INTEGRATION WORKS

To confirm that the Salesforce to database integration is working:

1. In the left panel, click **Integrations**.
2. If necessary, wait until your sample integration is a **Running** integration. If you used the example name, you would see that **Salesforce to Database Sample Integration** is **Running**.

3. In your Salesforce installation, create a new lead. Be sure to enter data in the fields that you mapped: **Company**, **Email**, **FirstName**, **LastName**, **LeadSource**, **Status**, **Phone**, and **Rating**.
4. In a new browser window, insert **todo-** in front of the URL for your Fuse Online installation. For example: **https://todo-app-proj7614.6a63.fuse-ignite.openshiftapps.com/**. Your Fuse Online installation provides the To Do app, which has a REST API for accessing a database that contains tasks. In the AMQ to REST API sample integration tutorial, there are instructions for uploading an OpenAPI (Swagger) file for the To Do app to create an API client connector.
5. In the **To Do App** display, you should see a notification that a new lead was created in the database.

4.6. CLEAN UP YOUR INTEGRATION

When you are done working with a sample integration, stop it and delete it:

1. In Fuse Online, in the left panel, click **Integrations**.
2. In the main panel, identify the entry for the sample integration that you want to stop.
3. In that entry, to the right, click  and then click **Stop**.
4. Click **Stop** to confirm that you want to stop running the integration.
5. In the entry for the integration that you just stopped, to the right, click  and then click **Delete**.
6. Click **Delete** to confirm that you want to delete the integration.

CHAPTER 5. IMPLEMENT AN AMQ TO REST API SAMPLE INTEGRATION

This sample integration connects to an AMQ broker to obtain item delivery records for a hypothetical enterprise. The integration then executes a custom step that operates on the records to identify any items that were damaged when they were received. After a simple data mapping, the integration connects to a REST API to obtain and provide contact information for vendors of damaged items.

The other sample integrations use connectors and data operations that are built into Fuse Online. This integration also does that, but in addition, it provides instructions for customizing and extending Fuse Online by leading you through the procedures for:

- Adding a custom data operation by uploading an extension.
- Adding a custom REST API client connector by uploading an OpenAPI (Swagger) file.

Fuse Online provides the extension file and the OpenAPI file.

To create this integration, you must be logged in to Fuse Online. If you are not already logged in, see [Chapter 2, *What to expect when using Fuse Online for the first time.*](#)

To implement the AMQ to REST API sample integration, the main steps are:

1. [Section 5.1, “Create an AMQ connection”](#)
2. [Section 5.2, “Make a custom step available”](#)
3. [Section 5.3, “Create a REST API connector”](#)
4. [Section 5.4, “Upload the To Do app icon”](#)
5. [Section 5.5, “Create a REST API connection”](#)
6. [Section 5.6, “Create and deploy AMQ to REST API sample integration”](#)
7. [Section 5.7, “Confirm that the AMQ to REST API integration works”](#)
8. [Section 5.8, “Clean up your integration”](#)

5.1. CREATE AN AMQ CONNECTION

The AMQ to REST API sample integration starts by connecting to an AMQ broker that is provided in your OpenShift project. Before you start to create the integration itself, you must:

1. [Section 5.1.1, “Start the provided AMQ broker”](#)
2. [Section 5.1.2, “Create a connection to that AMQ broker”](#)

5.1.1. Start the provided AMQ broker

To start the AMQ broker:

1. In a browser, go to the [OpenShift Web Console](#). Your Fuse Online environment runs on OpenShift Online.

2. In the console, on the right, under **My Projects**, click **Fuse Online** to display the project's overview.
Your project's name is something like **proj123456**.
3. In the overview, click the first entry, **broker-amq, #1** to expand the entry for the provided AMQ broker.
4. On the right, click the up caret to scale up to running 1 pod. This starts the AMQ broker.

5.1.2. Create a connection to that AMQ broker

To complete this procedure, you must be logged in to your Fuse Online environment. If you are not already logged in, see [Chapter 2, What to expect when using Fuse Online for the first time](#).

To create a connection to the AMQ broker that is running in your Fuse Online project in OpenShift:

1. In Fuse Online, in the left panel, click **Connections** to display any available connections.
2. In the upper right, click **Create Connection** to display Fuse Online connectors.
3. Click the **AMQ** connector.
4. Configure the connection by entering:
 - a. In the **Broker URL** field, enter **tcp://broker-amq-tcp:61616** as the location to obtain data from.
 - b. In the **Username** field, enter **amq** as the user name for the account that accesses this AMQ broker.
 - c. In the **Password** field, enter **topSecret** as the password for the account that accesses this AMQ broker.
 - d. Leave the other fields blank.
5. Click **Validate**. Fuse Online immediately tries to validate the connection and displays a message that indicates whether validation is successful. If validation fails, check the values you entered and try again.
6. When validation is successful, click **Next**.
7. In the **Connection Name** field, enter your choice of a name that helps you distinguish this connection from any other connections. For example, enter **AMQ Broker 1**.
8. In the **Description** field, optionally enter any information that is helpful to know about this connection. For example, enter **Sample AMQ connection that uses the provided broker**.
9. In the upper right, click **Create** to see that the connection you created is now available. If you entered the example name, you would see that **AMQ Broker 1** is now available.

5.2. MAKE A CUSTOM STEP AVAILABLE

Fuse Online provides a number of steps that operate on integration data between connections. If Fuse Online does not provide a between-connections step that meets your need, a developer can code an extension that defines one or more custom steps that operate on data between connections. The

developer gives you a `.jar` file that contains the extension. You then upload the extension in Fuse Online to make the custom step(s) available for use in integrations.

The AMQ to REST API sample integration uses a custom step that operates on data between connections to identify items that were damaged when they were received.

To make the **Damage Reporter** custom step available:

1. In a new browser tab, go to <https://github.com/syndesio/fuse-online-sample-extension/releases>.
2. Download the extension's `.jar` file.
3. In Fuse Online, in the left panel, click **Customizations**.
4. At the top, click **Extensions**.
5. Click **Import Extension**.
6. Click **Browse** and select the downloaded `.jar` file that contains the extension. Fuse Online validates the file, extracts and displays the extension's name, ID, and description, and lists **Damage Reporter** as the custom step that the extension defines.
7. Click **Import**. Fuse Online makes the custom step available and displays the extension details page.



NOTE

For more information about coding an extension and creating its `.jar` file, see the [Tooling User Guide](#).

5.3. CREATE A REST API CONNECTOR

Fuse Online can create connectors for REST APIs that support Hypertext Transfer Protocol (HTTP)/1.0 or HTTP/1.1. To do this, Fuse Online requires a valid OpenAPI 2.0 specification that describes a REST API you want to connect to.

Your Fuse Online installation provides the To Do app, which has a REST API for accessing a database that contains tasks. Your installation also provides an OpenAPI (Swagger) specification for this API.

To create a REST API connector for the To Do app:

1. Identify the URL for your Fuse Online installation's copy of the OpenAPI specification:
 - a. In the Fuse Online navigation panel, click **Home**.
 - b. Copy the URL into a text editor.
 - c. At the beginning of the URL, insert `todo-`.
 - d. At the end of the URL, replace `dashboard` with `swagger.json`.

The result is something like this: `https://todo-app-proj217402.6a63.fuse-ignite.openshiftapps.com/swagger.json`

2. In the Fuse Online navigation panel, click **Customizations**.

3. Click **Create API Connector**.
4. Select **Use a URL**.
5. In the input box, paste the URL for your OpenAPI specification and click **Next**.
6. On the **Review OpenAPI Actions** page, click **Next**. If you see a warning, you can ignore it.
7. Click **Next** again to accept **HTTP Basic Authorization**.
8. On the **Review/Edit Connector Details** page, Fuse Online populates the fields with values from the OpenAPI specification.
 - a. If you want to, you can change the values in the **Connector Name** and **Description** fields.
 - b. Confirm that the value in the **Host** field is correct. For example, it should be something like this: **https://todo-app-proj217402.6a63.fuse-ignite.openshiftapps.com**.
 - c. Confirm that the value in the **Base URL** field is **/api**.
9. Click **Create API Connector**.

Fuse Online displays the **API Client Connectors** tab with an entry for the **Todo App API** that you just created.

5.4. UPLOAD THE TO DO APP ICON

To show the flow of an integration, Fuse Online displays icons that identify the applications that the integration is connecting to. Your Fuse Online installation provides an icon for the To Do app.

To upload the To Do app icon:

1. Display the To Do app icon:
 - a. In a new browser tab, paste the URL for your OpenAPI (Swagger) specification.
 - b. At the end of the URL, replace **swagger.json** with **images/todo_icon.png** and click **Enter**. For example: **https://todo-app-proj217402.6a63.fuse-ignite.openshiftapps.com/images/todo_icon.png**.
2. Save the **todo_icon.png** image.
3. In Fuse Online, in the **API Client Connectors** tab, click the entry for the **Todo App API** to display its details.
4. On the **Connector Details** page, click **Browse**.
5. Navigate to **todo_icon.png**, select it, and click **Open**.
6. Refresh the display of the **Connector Details** page. The image now appears on the left.

5.5. CREATE A REST API CONNECTION

To create a connection to the To Do app REST API:

1. In Fuse Online, in the left panel, click **Connections** to display any available connections.

2. In the upper right, click **Create Connection** to display available connectors.
3. Click the **Todo App API** connector that you just created.
4. In the **Todo App API Configuration**, notice that Fuse Online populates the **Authentication Type**, **Base Path**, and **Host** fields from the connector information.
5. In the **Username** field, enter any value. For this sample integration, user name and password values are required but they are not used.
6. In the **Password** field, enter any value.
7. Click **Next**.
8. In the **Connection Name** field, enter your choice of a name that helps you distinguish this connection from any other connections. For example, enter **Todo App API Client**.
9. In the **Description** field, optionally enter any information that is helpful to know about this connection. For example, enter **Connection to the provided Todo app REST API**.
10. In the upper right, click **Create** to see that the connection you created is now available.

5.6. CREATE AND DEPLOY AMQ TO REST API SAMPLE INTEGRATION

To create and deploy the AMQ to REST API sample integration, the main steps are:

1. [Section 5.6.1, "Choose the start connection"](#)
2. [Section 5.6.2, "Choose the finish connection"](#)
3. [Section 5.6.3, "Add a damage reporter step"](#)
4. [Section 5.6.4, "Add a data mapping step"](#)
5. [Section 5.6.5, "Give the integration a name and deploy it"](#)

5.6.1. Choose the start connection

To choose the start connection:

1. In Fuse Online, on the left, click **Integrations**.
2. Click **Create Integration**.
3. On the **Choose a Start Connection** page, click your AMQ connection. If you specified the example name, you would click **AMQ Broker 1**.
4. On the **Choose an Action** page, click the **Subscribe for Messages** action to receive messages from the queue you specify.
5. In the **Destination Name** field, enter **inventoryReceived** for the name of the queue to obtain data from.
6. Click in the **Destination Type** field and select **Queue**.
7. Leave the other fields blank.

8. Click **Next**. Fuse Online prompts you to specify the output data type. This is not needed for this sample integration.
9. Click **Done** to add the start connection to the integration.

After connecting to AMQ, the integration watches for messages on the **inventoryReceived** queue. When a message is available, the integration passes it to the **Damage Reporter** step. However, before you can add that step to the integration, you must choose the integration's finish connection.

5.6.2. Choose the finish connection

To add the finish connection to the integration:

1. In Fuse Online, on the **Choose a Finish Connection** page, click the To Do app connection that you created. If you assigned the example name, you would click **Todo App API Client**.
2. On the **Choose an Action** page, click **Create new task**, which provides information about who to contact to address a particular damaged item.

5.6.3. Add a damage reporter step

With the start and finish connections in place, you are ready to add the custom step that receives the messages from the AMQ broker and identifies any items that were damaged when they were received.

To add the custom damage reporter step:

1. In Fuse Online, in the center, click **Add a Step**.
2. On the **Choose a Step** page, click **Damage Reporter**.

5.6.4. Add a data mapping step

Add a data mapping step that correlates the **task** field in the output from the damage reporter step to the **task** field in the database that the REST API accesses:

1. In Fuse Online, in the left panel, hover over the plus sign between the damage reporter step and the finish connection to display a pop-up in which you click **Add a Step**.
2. On the **Choose a Step** page, click **Data Mapper**. In the data mapper, the **Sources** panel on the left displays the fields in the output from the damage reporter step. The **Target** panel on the right displays the fields in the database that the API accesses.
3. In the **Sources** panel, click the **task** field.
4. In the **Target** panel, expand the **body** field and click **task**.
5. Click **Done**.

5.6.5. Give the integration a name and deploy it

The sample integration is complete. To deploy it:

1. In Fuse Online, in the upper right, click **Publish** to give it a name.

2. In the **Integration Name** field, enter a name for the integration. For example, **AMQ to REST API Sample Integration**.
3. Optionally, in the **Description** field, enter information that might be helpful to know about this integration.
4. In the upper right corner, click **Publish**.

Fuse Online displays the integration summary page with a progress indicator that shows the publishing stages. Fuse Online is generating the runtime for the integration and will start it when the runtime is ready. This takes a few minutes.



NOTE

A Fuse Online account is limited to a specific number of integrations that can be running at one time. For details, see the pricing plan. If you are already running the maximum number of integrations, then you must stop an integration before you can start running another one.

If you are using a Fuse Online evaluation account, then only one integration at a time can be running. If you already created one of the other sample integrations and that integration is running then this integration is automatically in the **Stopped** state. You must stop the running integration and then you can then publish this integration.

If you are already running the maximum number of integrations, follow these steps to stop an integration:

1. In the left panel, click **Integrations**.
2. In the entry for the integration that you want to stop, click  on the far right.
3. In the popup, click **Stop**.

After stopping an integration, start another integration as follows:

1. In the left panel, click **Integrations**.
2. In the entry for the integration that you want to start, click  on the far right.
3. In the popup, click **Publish**.

5.7. CONFIRM THAT THE AMQ TO REST API INTEGRATION WORKS

To confirm that the AMQ to REST API integration is working:

1. In Fuse Online, in the left panel, click **Integrations**.
2. Confirm that your AMQ to REST API integration is **Running**. The integration must be **Running** before you continue with these instructions.
3. In a new browser window, go to the To Do app display by inserting **todo-** in front of the URL for your Fuse Online installation. For example: **<https://todo-app-proj7614.6a63.fuse-ignite.openshiftapps.com/>**.

4. In the To Do app display, click **Show JMS Form** to display an input box that contains an XML message.
5. Click **Send JMS Message** to send that message to the AMQ broker in your OpenShift project. Successful execution returns a task from the To Do app client API. The task identifies the ID of the damaged item and the contact information for its vendor. If the task does not appear in a moment or two, try reloading the page.
6. Edit the XML message to specify two damaged items:
 - a. Click **Show JMS Form** to display the message input box again.
 - b. In the XML message, change the entry for the undamaged item to specify **damaged="true"**.
 - c. Click **Send JMS Message**. The To Do app client API returns a new task that contains IDs for two damaged items and contact information for the two vendors.
7. Edit the XML message to specify an ID that you make up:
 - a. Click **Show JMS Form**.
 - b. In the XML message, for the item that has **damaged="true"**, change the item ID, for example, to **1234**.
 - c. Click **Send JMS Message**. The To Do app client API returns a new task with the item ID that you just entered.

5.8. CLEAN UP YOUR INTEGRATION

When you are done working with a sample integration, stop it and delete it:

1. In Fuse Online, in the left panel, click **Integrations**.
2. In the main panel, identify the entry for the sample integration that you want to stop.
3. In that entry, to the right, click  and then click **Stop**.
4. Click **Stop** to confirm that you want to stop running the integration.
5. In the entry for the integration that you just stopped, to the right, click  and then click **Delete**.
6. Click **Delete** to confirm that you want to delete the integration.