



## Red Hat Fuse 7.8

# Installing and Operating Fuse Online on OpenShift Container Platform

Install, configure, and upgrade Fuse Online, and export/import integrations for CI/CD pipelines



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## Abstract

Information and instructions for installing, managing, and operating Fuse Online on OpenShift Container Platform in a customer-managed environment on-site, in the cloud, or in a hybrid cloud.

## Table of Contents

<b>PREFACE</b> .....	<b>4</b>
<b>CHAPTER 1. INSTALLING FUSE ONLINE ON OCP 4.X</b> .....	<b>5</b>
1.1. OVERVIEW OF THE STEPS REQUIRED TO INSTALL FUSE ONLINE ON OCP 4.X	5
1.1.1. Considerations for installing Fuse Online in a restricted environment (OCP 4.6 and later)	5
1.2. WHEN EDITING THE DEFAULT CUSTOM RESOURCE IS REQUIRED BEFORE INSTALLING FUSE ONLINE	6
1.3. DESCRIPTIONS OF CUSTOM RESOURCE ATTRIBUTES THAT CONFIGURE FUSE ONLINE	7
1.4. ABOUT CONFIGURING FUSE ONLINE FOR JAEGER MONITORING	13
1.5. CREATING A SECRET FOR INSTALLING FUSE ONLINE WITH AN EXTERNAL DATABASE	16
1.6. INSTALLING FUSE ONLINE	17
1.6.1. Creating a secret to access the Red Hat registry	17
1.6.2. Installing the Fuse Online Operator from the OperatorHub	18
1.6.3. Adding a Fuse Online instance to an OpenShift 4.x project	20
<b>CHAPTER 2. INSTALLING FUSE ONLINE ON OCP 3.11</b> .....	<b>22</b>
2.1. OVERVIEW OF THE STEPS REQUIRED TO INSTALL FUSE ONLINE ON OCP 3.11	22
2.2. REGISTERING A CUSTOM RESOURCE DEFINITION FOR DEPLOYING FUSE ONLINE RESOURCES	24
2.3. WHEN EDITING THE DEFAULT CUSTOM RESOURCE IS REQUIRED BEFORE INSTALLING FUSE ONLINE	25
2.4. DESCRIPTIONS OF CUSTOM RESOURCE ATTRIBUTES THAT CONFIGURE FUSE ONLINE	26
2.5. EDITING THE DEFAULT CUSTOM RESOURCE FILE BEFORE INSTALLING FUSE ONLINE	32
2.6. ABOUT CONFIGURING FUSE ONLINE FOR JAEGER MONITORING	33
2.7. CREATING A SECRET FOR INSTALLING FUSE ONLINE WITH AN EXTERNAL DATABASE	36
2.8. RUNNING THE SCRIPT THAT INSTALLS FUSE ONLINE ON OCP 3.11	37
<b>CHAPTER 3. CHANGING THE CONFIGURATION OF A FUSE ONLINE ENVIRONMENT</b> .....	<b>39</b>
3.1. FUSE ONLINE CONFIGURATION CHANGES ALLOWED AFTER INSTALLATION	39
3.2. GENERAL PROCEDURE FOR CHANGING FUSE ONLINE CONFIGURATION	40
3.3. CONFIGURING FUSE ONLINE AND 3SCALE DISCOVERY OF APIS	42
3.3.1. Configuring Fuse Online to enable 3scale discovery of APIs	42
3.3.2. Configuring Fuse Online to disable 3scale discovery of APIs	44
3.4. CONFIGURING FUSE ONLINE PODS	45
3.5. CONFIGURING THE HTTP PROXY	47
3.6. ADDING A SAMPLE APP TO A FUSE ONLINE ENVIRONMENT RUNNING ON OCP	48
<b>CHAPTER 4. MANAGING FUSE ONLINE ON OCP</b> .....	<b>50</b>
4.1. MONITORING FUSE ONLINE INTEGRATIONS AND INFRASTRUCTURE COMPONENTS WITH PROMETHEUS	50
4.2. FUSE ONLINE METERING LABELS	53
4.3. BACKING UP A FUSE ONLINE ENVIRONMENT	54
4.4. RESTORING A FUSE ONLINE ENVIRONMENT	56
4.5. UPGRADING FUSE ONLINE	59
4.5.1. Access Docker images before an upgrade	59
4.5.1.1. Accessing Docker images on OCP4	60
4.5.1.2. Accessing Docker images on OCP 3.11	61
4.5.2. Upgrading Fuse Online by using the OperatorHub	62
4.5.3. Upgrading Fuse Online by using the install script	62
4.6. UNINSTALLING FUSE ONLINE FROM AN OCP PROJECT	65
4.7. DELETING AN OCP PROJECT THAT CONTAINS FUSE ONLINE	65
<b>CHAPTER 5. HOW TO INVOKE FUSE ONLINE PUBLIC REST API ENDPOINTS</b> .....	<b>66</b>
5.1. EXPOSING FUSE ONLINE PUBLIC REST APIS FOR USE BY EXTERNAL TOOLS	66

5.2. DESCRIPTION OF BASE URL FOR FUSE ONLINE PUBLIC REST API ENDPOINTS	68
5.3. OBTAINING A SECRET TOKEN FOR CALLING A PUBLIC REST API ENDPOINT	69
5.4. HOW TO FIND INTEGRATION IDS	70
5.5. FORMAT FOR SPECIFYING CURL COMMANDS TO INVOKE FUSE ONLINE PUBLIC ENDPOINTS	70
<b>CHAPTER 6. USING EXTERNAL TOOLS TO EXPORT/IMPORT FUSE ONLINE INTEGRATIONS FOR CI/CD</b> ...	<b>72</b>
6.1. ABOUT MARKING INTEGRATIONS FOR CI/CD	72
6.2. MARKING AN INTEGRATION FOR CI/CD	72
6.3. MANAGING ENVIRONMENT LABELS FOR CI/CD	73
6.4. INVOKING THE FUSE ONLINE PUBLIC API EXPORT ENDPOINT	74
6.5. INVOKING THE FUSE ONLINE PUBLIC API IMPORT ENDPOINT	76
<b>CHAPTER 7. FUSE ONLINE PUBLIC REST API ENDPOINTS REFERENCE</b> .....	<b>79</b>
7.1. ENDPOINT FOR OBTAINING THE STATE OF AN INTEGRATION	79
7.2. ENDPOINT FOR OBTAINING A LIST OF AN INTEGRATION'S ENVIRONMENT LABELS	80
7.3. ENDPOINT FOR MARKING AN INTEGRATION AND KEEPING UNSPECIFIED TAGS	81
7.4. ENDPOINT FOR MARKING AN INTEGRATION AND REMOVING UNSPECIFIED TAGS	83
7.5. ENDPOINT FOR PUBLISHING AN INTEGRATION	84
7.6. ENDPOINT FOR STOPPING AN INTEGRATION	85
7.7. ENDPOINT FOR EXPORTING INTEGRATIONS	86
7.8. ENDPOINT FOR IMPORTING INTEGRATIONS	88
7.9. ENDPOINT FOR REMOVING AN ENVIRONMENT LABEL FROM A PARTICULAR INTEGRATION	89
7.10. ENDPOINT FOR CREATING AN ENVIRONMENT LABEL	90
7.11. ENDPOINT FOR OBTAINING A LIST OF ENVIRONMENT LABELS	91
7.12. ENDPOINT FOR CHANGING AN ENVIRONMENT LABEL	92
7.13. ENDPOINT FOR REMOVING AN ENVIRONMENT LABEL FROM ALL INTEGRATIONS	93
7.14. ENDPOINT FOR CHANGING A CONNECTION'S PROPERTIES	94
<b>CHAPTER 8. REBRANDING THE FUSE ONLINE USER INTERFACE</b> .....	<b>97</b>



## PREFACE

You can install and operate Fuse Online on-site on OpenShift Container Platform (OCP). When Fuse Online is running on-site, additional features are available beyond the features that are provided when Fuse Online is running on OpenShift Dedicated.

The term *on-site* means a customer-managed environment; Red Hat is not managing the OpenShift environment. A customer-managed environment can be on-premise, in the cloud, or in a hybrid cloud.

See the following topics for details:

- [Chapter 1, \*Installing Fuse Online on OCP 4.x\*](#)
- [Chapter 2, \*Installing Fuse Online on OCP 3.11\*](#)
- [Chapter 3, \*Changing the configuration of a Fuse Online environment\*](#)
- [Chapter 4, \*Managing Fuse Online on OCP\*](#)
- [Chapter 5, \*How to invoke Fuse Online public REST API endpoints\*](#)
- [Chapter 6, \*Using external tools to export/import Fuse Online integrations for CI/CD\*](#)
- [Chapter 7, \*Fuse Online public REST API endpoints reference\*](#)
- [Chapter 8, \*Rebranding the Fuse Online user interface\*](#)



# CHAPTER 1. INSTALLING FUSE ONLINE ON OCP 4.X

Fuse Online is a flexible and customizable, open source platform that provides core integration capabilities as a service.

Each installation of Fuse Online is referred to as a Fuse Online instance (or environment). In a given OpenShift project, there can be exactly one Fuse Online instance. Each Fuse Online instance has its own URL. In a single OpenShift cluster, there can be multiple Fuse Online instances.

You can install Fuse Online as an OpenShift developer user (you do not need administrator privileges). You can install a default Fuse Online instance or a customized Fuse Online instance. For a customized Fuse Online instance, you must edit the default custom resource.



## IMPORTANT

The Fuse Online installation process requires access to [registry.redhat.io](https://registry.redhat.io), which is the Red Hat catalog for container images.

The following topics provide details for installing Fuse Online:

- [Section 1.1, “Overview of the steps required to install Fuse Online on OCP 4.x”](#)
- [Section 1.1.1, “Considerations for installing Fuse Online in a restricted environment \(OCP 4.6 and later\)”](#)
- [Section 1.2, “When editing the default custom resource is required before installing Fuse Online”](#)
- [Section 1.3, “Descriptions of custom resource attributes that configure Fuse Online”](#)
- [Section 1.4, “About configuring Fuse Online for Jaeger monitoring”](#)
- [Section 1.6.1, “Creating a secret to access the Red Hat registry”](#)
- [Section 1.6, “Installing Fuse Online”](#)

## 1.1. OVERVIEW OF THE STEPS REQUIRED TO INSTALL FUSE ONLINE ON OCP 4.X

To install Fuse Online on OCP 4.x, here are the main steps:

1. Generate an OpenShift secret that configures Red Hat Service Registry authentication
2. Install the Fuse Online Operator from the OperatorHub to a project (namespace) on the cluster.
3. Optionally, if you want to include an external database for persisting connection and integration definitions, create an OpenShift secret.
4. Add a Fuse Online instance to an OpenShift 4.x project.  
Optionally, edit the custom resource to enable one or more add-on features and/or implement one or more custom configuration settings.

### 1.1.1. Considerations for installing Fuse Online in a restricted environment (OCP 4.6 and later)

Before you install Fuse Online in a restricted environment, you must complete the following tasks:

- Mirror all of the Fuse Online images to a location available on your private network. For more information about installing images for OpenShift operators in a restricted environment, see the [Using Operator Lifecycle Manager on restricted networks](#) section in the OpenShift documentation.
- Set up a custom Maven repository with the Fuse repository contents. See the Red Hat Solution “How to create an offline Maven repository for Fuse 7” <https://access.redhat.com/solutions/3746581> for detailed information.
- Edit the Fuse Online custom resource as described in Editing the default custom resource file before installing Fuse Online:
  - Use the **mavenRepositories** setting to specify the offline Maven repository so that Fuse Online can fetch the needed dependencies when a developer builds and runs an integration. In the following example, replace **customRepo** with the name of your offline Maven repository and replace **https://customRepo** with your offline repository’s URL:

```
components:
  server:
    features:
      maven:
        repositories:
          customRepo: https://customRepo
```

- Disable the **todo** addon by changing the **enabled** value to **false**.

```
spec:
  addons:
    todo:
      enabled: false
```

After you install Fuse Online in a restricted environment, optionally you can download the **todo** application from <https://github.com/syndesio/todo-example> and follow the steps in the Readme file, changing the repository URL to the location available on your private network.

## 1.2. WHEN EDITING THE DEFAULT CUSTOM RESOURCE IS REQUIRED BEFORE INSTALLING FUSE ONLINE

The Fuse Online installation includes a default custom resource, which specifies the default settings for configurable Fuse Online environment add-on features and parameter settings.

You need to edit the default custom resource before you install Fuse Online if you want the installed Fuse Online environment to:

- Use a URL that you specify for the OpenShift route by which the Fuse Online console can be reached. The default is that the installation process calculates this route.
- Use an external database to store connection and integration definitions. The default is that the environment uses an internal database.
- Increase the amount of internal storage that is available for persisting connection and integration definitions. The default, which is **1Gi**, is sufficient for most Fuse Online environments.

To configure a Fuse Online environment for any one of these behaviors, you **MUST** edit the custom resource when you install Fuse Online. In other words, you cannot change the configuration of an installed Fuse Online environment to implement any of these behaviors. Also, after you install a Fuse Online environment that is configured for any of these behaviors, you cannot change that behavior in the installed environment.

### 1.3. DESCRIPTIONS OF CUSTOM RESOURCE ATTRIBUTES THAT CONFIGURE FUSE ONLINE

In addition to the custom resource attributes that you can specify only before installation, there are a number of custom resource attributes that you can change before or after installation.

Table 1 provides a brief description of configurable custom resource settings and indicates when you can change them: before and/or after installation. To achieve the Fuse Online configuration that you want, use the information in this table to determine how you need to change the custom resource before installation or how you want to change it after installation. Then follow the appropriate procedure:

For OCP 4.x:

- [Adding a Fuse Online instance to an OpenShift 4.x project](#)
- [General procedure for changing Fuse Online configuration](#)

For OCP 3.11:

- [Editing the default custom resource file before installing Fuse Online](#)
- [General procedure for changing Fuse Online configuration](#)

Table 1.1. Configurable custom resource settings

Feature/Setting	When you can set this	Specification
<p><b>Enhanced activity tracking</b></p> <p>Additional information about enhanced activity tracking follows this table.</p>	Set only before installation	<p><b>addons:</b>  <b>jaeger:</b>  <b>enabled: true</b>  <b>clientOnly: false</b>  <b>operatorOnly: false</b></p> <p>Enhanced activity tracking is enabled, by default. If you want to customize the Jaeger configuration, you can set <b>clientOnly</b> or <b>operatorOnly</b> to <b>true</b>.</p>

Feature/Setting	When you can set this	Specification
<p><b>External database</b></p> <p>Additional information about using an external database follows this table.</p>	<p>Set only before installation</p>	<p><b>spec:</b>  <b>components:</b>  <b>database:</b>  <b>externalDbURL: postgresql://custom-postgres:5432</b>  <b>user: db-user-name</b>  <b>name: db-name</b></p> <p>Replace <b>custom-postgres:5432</b> with the host name and port for a PostgreSQL database.  Replace <b>db-user-name</b> with the name of a user account that can access that database.  Replace <b>db-name</b> with the name of the database.</p>
<p><b>Internal storage capacity</b> for connections and integrations.</p> <p>Ignored if you also specify an external database.</p> <p>Additional information about increasing internal storage follows this table.</p>	<p>Set only before installation</p>	<p><b>spec:</b>  <b>components:</b>  <b>database:</b>  <b>resources:</b>  <b>volumeCapacity: 1Gi</b>  <b>volumeName: my-volume</b></p> <p>Replace <b>1Gi</b> with the amount of storage you need. The default is <b>1Gi</b>.</p> <p>Replace <b>my-volume</b> with the name of the volume to use for internal storage. This parameter is optional.</p>
<p><b>OpenShift route</b> for accessing Fuse Online console</p>	<p>Set only before installation</p>	<p><b>spec:</b>  <b>routeHostname: project.route.com</b></p> <p>Replace <b>project.route.com</b> with the OpenShift route by which the Fuse Online console can be reached.  For example: <b>north-project.6a63.fuse-online.openshiftapps.com</b></p>

Feature/Setting	When you can set this	Specification
<p><b>Memory and CPU</b></p> <p>Increase the default amount of memory that is available to one or more components.</p> <p>Each component defines its own memory requirement, which means that each pod has a limit on the amount of memory it is assigned. For information about limit and request settings, see the section on <a href="#">Configuring cluster memory to meet container memory and risk requirements</a> in the OpenShift documentation.</p> <p>You can also specify CPU resources for the <b>server</b> component.</p> <p>The <b>database</b> component is the internal database that stores connection and integration definitions.</p> <p>The <b>meta</b> component provides the business logic, such as the connectors, which the server loads.</p> <p>The <b>prometheus</b> component monitors Fuse Online infrastructure components and Fuse Online integrations.</p>	<p>Set only before installation</p>	<p><b>components:</b></p> <p><b>server:</b></p> <p><b>resources:</b></p> <p><b>limit:</b></p> <p><b>memory: "1024Mi"</b></p> <p><b>cpu: "800m"</b></p> <p><b>request:</b></p> <p><b>memory: "512Mi"</b></p> <p><b>cpu: "500m"</b></p> <p><b>meta:</b></p> <p><b>resources:</b></p> <p><b>limit:</b></p> <p><b>memory: "750Mi"</b></p> <p><b>request:</b></p> <p><b>memory: "300Mi"</b></p> <p><b>database:</b></p> <p><b>resources:</b></p> <p><b>limit:</b></p> <p><b>memory: "300Mi"</b></p> <p><b>request:</b></p> <p><b>memory: "300Mi"</b></p> <p><b>prometheus:</b></p> <p><b>resources:</b></p> <p><b>limit:</b></p> <p><b>memory: "750Mi"</b></p> <p><b>request:</b></p> <p><b>memory: "750Mi"</b></p>
<p><b>3scale discovery</b></p> <p>Expose APIs for Fuse Online API provider integrations so that they are discoverable by Red Hat 3scale.</p> <p>More information: <a href="#">Configuring Fuse Online to enable 3scale discovery of APIs</a>.</p>	<p>Set before or after installation</p>	<p><b>components:</b></p> <p><b>server:</b></p> <p><b>features:</b></p> <p><b>managementUrlFor3scale: https://url-for-3scale</b></p> <p>Specify the URL for your 3scale user interface.</p>

Feature/Setting	When you can set this	Specification
<p><b>Backups</b></p> <p>Additional setup steps are described in <a href="#">Backing up a Fuse Online environment</a>.</p>	<p>Set before or after installation</p>	<p><b>spec:</b>  <b>backup:</b>  <b>schedule: interval</b></p> <p>Replace <b>interval</b> with the desired duration between backups. Use <b>cron</b> utility format for <a href="#">intervals</a> and <a href="#">predefined schedules</a>. Do not specify the <b>@</b> sign in front of the interval.</p>
<p><b>Node affinity and tolerations</b></p> <p>Determines the placement of Fuse Online infrastructure component and integration pods onto nodes within the cluster.</p> <p>Node affinity allows you to specify an affinity for Fuse Online pods towards a group of nodes to be placed on.</p> <p>Tolerations allows you to control which nodes the Fuse Online pods run on and to prevent other workloads from using those nodes.</p> <p>See also: <a href="#">Configuring Fuse Online pods</a>.</p>	<p>Set before or after installation</p>	<p><b>Note:</b> Use <b>infraScheduling</b> for Fuse Online infrastructure component deployments. For Fuse Online integration deployments, replace <b>infraScheduling</b> with <b>integrationScheduling</b>.</p> <p><b>spec:</b>  <b>infraScheduling:</b>  <b>tolerations:</b>  <b>key: value</b>  <b>operator: value</b>  <b>effect: value</b></p> <p><b>spec:</b>  <b>infraScheduling:</b>  <b>affinity:</b>  <b>nodeAffinity:</b>  <b>preferredDuringSchedulingIgnoredDuringExecution:</b>  <b>weight:</b>  <b>preference:</b>  <b>matchExpressions:</b>  <b>key: value</b>  <b>operator: value</b>  <b>values:</b>  <b>value1,</b>  <b>value2</b></p>
<p><b>Integration limit</b></p> <p>Specify the maximum number of running integrations. The default, <b>0</b>, does not limit the number of running integrations.</p>	<p>Set before or after installation</p>	<p><b>components:</b>  <b>server:</b>  <b>features:</b>  <b>integrationLimit: 0</b></p>

Feature/Setting	When you can set this	Specification
<p><b>Database connection pool</b></p> <p>You can adjust the server connection pool configuration to manage the connections to the database.</p> <p>Additional information about the database pool configuration follows this table.</p>	<p>Set before or after installation</p>	<p><b>components:</b>  <b>server:</b>  <b>connectionPool:</b>  <b>connectionTimeout: 30000</b>  <b>idleTimeout: 600000</b>  <b>leakDetectionThreshold: 0</b>  <b>maxLifetime: 1800000</b>  <b>maximumPoolSize: 10</b>  <b>minimumIdle: 10</b></p>
<p><b>Java Options</b></p> <p>You can specify Java options for the <b>syndesis-server</b> and <b>syndesis-meta</b> components.</p> <p>Depending on the Java option, you can specify different values for the components. For example, you can set a JVM-related parameter for <b>syndesis-server</b> only, because it requires more computer resources than <b>syndesis-meta</b>.</p>	<p>Set before or after installation</p>	<p><b>components:+ server:</b>  <b>javaOptions:</b>  <b>-option_name=my_value meta:</b>  <b>javaOptions:</b>  <b>-option_name=my_value</b></p> <p>Replace <b>-option_name</b> with the Java option name. You can specify any Java option prefix (<b>-D</b>, <b>-X</b>, or <b>-XX</b>).</p> <p>Replace <b>my_value</b> with value for the option.</p> <p>For example, to configure the HTTP proxy:  <b>components:+ server:</b>  <b>javaOptions:</b>  <b>-Dhttp.proxyHost=10.0.0.100 -</b>  <b>Dhttp.proxyPort=8800 meta:</b>  <b>javaOptions:</b>  <b>-Dhttp.proxyHost=10.0.0.100 -</b>  <b>Dhttp.proxyPort=8800`</b></p>
<p><b>Maven Arguments</b></p> <p>Specify additional Maven options to use when building Fuse Online integrations.</p>	<p>Set before or after installation</p>	<p><b>components:</b>  <b>server:</b>  <b>features:</b>  <b>maven:</b>  <b>additionalArguments:</b>  <b>"typeA=stringA typeB=stringB"</b></p> <p>For example:  <b>additionalArguments:</b>  <b>"-Dhttp.proxy=my_proxy -</b>  <b>DpropA=valueA"</b></p>

Feature/Setting	When you can set this	Specification
<p><b>Maven Repositories</b></p> <p>Specify external Maven repositories that your Fuse Online environment needs to access.</p>	Set before or after installation	<p><b>components:</b></p> <p><b>server:</b></p> <p><b>features:</b></p> <p><b>mavenRepositories:</b></p> <p><b>customRepo1: https://customRepo1</b></p> <p><b>customRepo2: https://customRepo2</b></p> <p>Replace <b>customRepo</b> with the name of a repository.</p> <p>For each repository, specify its URL.</p>
<p><b>Monitoring</b></p> <p>See also: <a href="#">Monitoring Fuse Online integrations on OCP with Prometheus</a>.</p>	Set before or after installation	<p><b>addons:</b></p> <p><b>ops:</b></p> <p><b>enabled: true</b></p>
<p><b>Public REST API</b></p> <p>Additional set-up steps are described in <a href="#">Exposing Fuse Online public REST API endpoints for use by external tools</a>.</p>	Set before or after installation	<p><b>addons:</b></p> <p><b>publicApi:</b></p> <p><b>enabled: true</b></p> <p><b>routeHostname: public-syndesis.192.168.64.63.nip.io</b></p> <p>Set <b>routeHostname</b> to the public address for invoking Fuse Online REST API endpoints. Your cluster setup determines the public address that you need to specify. In the previous example, the route host name is valid for a minishift cluster.</p>
<p><b>ToDo app</b></p> <p>For testing sample integrations.</p>	Set before or after installation	<p><b>addons:</b></p> <p><b>todo:</b></p> <p><b>enabled: false</b></p> <p><b>Note:</b> For installing Fuse Online in a restricted environment, you must make sure that the <b>todo</b> addon is set to <b>false</b> (the default) before installation. After installing Fuse Online, you can optionally download the todo application from <a href="https://github.com/syndesisio/todo-example">https://github.com/syndesisio/todo-example</a> and follow the steps in the <b>Readme</b> file, changing the repository URL to a location available on your private network.</p> <p>See also <a href="#">Adding a sample app to a Fuse Online environment running on OCP</a>.</p>

## About add-on features and configuration settings



- **Enhanced activity tracking**

Activity tracking, using Jaeger, is enabled by default when you install Fuse Online. The Fuse Online installation (from the OperatorHub or the command-line script) detects the existence of the OperatorHub and installs Jaeger by using the OperatorHub's subscription functionality. For the limited circumstances in which the OperatorHub is not available, Fuse Online uses its own installation functions to install Jaeger. Optionally, you can customize the Jaeger configuration before you install Fuse Online as described in the [About configuring Fuse Online for Jaeger monitoring](#) section.

- **External database for persisting connections and integrations**

A default installation of Fuse Online provides an internal PostgreSQL database that Fuse Online uses to persist connection and integration definitions. You can choose to use an external PostgreSQL database instead, such as [Amazon RDS for PostgreSQL](#).

- **Internal storage capacity**

The default setting of **1Gi** is sufficient for most Fuse Online environments. It is expected that you would increase this setting for a new Fuse Online installation only upon the recommendation of Red Hat technical support. That is, you have been running another Fuse Online environment in which you encountered Fuse Online server errors and Red Hat technical support determined that you need to install a new Fuse Online environment with a database volume capacity that is larger than the default.

To increase Fuse Online internal storage capacity in an OpenShift project that is already running Fuse Online, you must first uninstall Fuse Online. See [Uninstalling Fuse Online from an OCP project](#).

- **Database connection pool configuration**

You can configure the following **syndesis-server** database connection pool properties:

- **connectionTimeout** - The maximum number of milliseconds that the **syndesis-server** waits for a connection from the pool. The lowest acceptable connection timeout is 250 ms. The default is 30000 (30 seconds).
- **idleTimeout** - The maximum amount of time (in milliseconds) that a connection is allowed to sit idle in the pool before the connection is removed. A value of 0 means that idle connections are never removed from the pool. The minimum allowed value is 10000 (10 seconds). The default is 600000 (10 minutes),
- **leakDetectionThreshold** - The amount of time (in milliseconds) that a connection can be out of the pool before a message is logged indicating a possible connection leak. A value of 0 means leak detection is disabled. The lowest acceptable value for enabling leak detection is 2000 (2 seconds). The default is 0.
- **maxLifetime** - The maximum lifetime (in milliseconds) of a connection in the pool. The minimum allowed value is 30000 (30 seconds). The default is 1800000 (30 minutes).
- **maximumPoolSize** - The maximum size that the pool is allowed to reach, including both idle and in-use connections. The default is 10.
- **minimumIdle** - The minimum number of idle connections maintained in the pool. The default is the value of **maximumPoolSize**.

## 1.4. ABOUT CONFIGURING FUSE ONLINE FOR JAEGER MONITORING

Jaeger is open source software for tracing transactions between distributed services. It is especially useful for monitoring and troubleshooting complex microservices environments.

When you install Fuse Online, either from the OperatorHub or by using the command-line script, the Fuse Online installation detects the existence of the OperatorHub and installs Jaeger by using the OperatorHub's subscription functionality. For the limited circumstances in which the OperatorHub is not available, Fuse Online uses its own installation functions to install Jaeger.

A default Fuse Online environment configures all needed Jaeger components. Optionally, you can edit the Fuse Online custom resource to specify a client-only/independent server configuration or a hybrid Jaeger client and Jaeger Operator configuration.

## Default Jaeger configuration

The basic, out-of-the-box, configuration includes all Jaeger components. You can start learning about how Jaeger works by experimenting with its monitoring capabilities. The default configuration provides a memory-only, limited, backend storage capability.

Installing Fuse Online with the default Jaeger configuration has the following results:

- Fuse Online components have Jaeger communication URLs.
- Jaeger Operator is installed.
- Jaeger custom resource is configured with a default configuration for activity monitoring.

A Fuse Online installation with the default Jaeger configuration, has the following **syndesis** custom resource specification:

```
apiVersion: syndesis.io/v1beta2
kind: Syndesis
metadata:
  name: app
spec:
  addons:
    jaeger:
      enabled: true
```

When the **clientOnly** and **operatorOnly** are unspecified (set to **false**, by default) Fuse Online uses the provided Jaeger backend as well as the default, memory-only storage provided by the Jaeger server configuration.

## Client-only/independent server configuration

With a client-only/independent server configuration, only client URL connections are configured for communication between Fuse Online and an externally configured Jaeger backend. All aspects of the Jaeger backend are external and independent of the Fuse Online environment and **syndesis-operator**. This includes the Jaeger Operator and the Jaeger custom resource.

To install a client-only Jaeger configuration, edit the custom resource before you install Fuse Online as follows:

- Set **clientOnly** to **true** to add [Jaeger agent capabilities](#).
- Set **queryUri** to the URI of the [query component](#) of the independently installed Jaeger backend.
- Set **collectorUri** to the URI of the [collector component](#) of the independently installed Jaeger backend.

For example:

```
apiVersion: syndesis.io/v1beta2
kind: Syndesis
metadata:
  name: app
spec:
  addons:
    jaeger:
      enabled: true
      clientOnly: true
      queryUri: http://jaeger-query-hostname:443/api
      collectorUri: http://jaeger-collector-hostname:14268/api/traces
```

## Hybrid Jaeger client and operator configuration

With a hybrid Jaeger client and Jaeger Operator configuration, Fuse Online installs the Jaeger Operator as well as the Jaeger client capabilities. A Jaeger custom resource is not installed. You must install your own Jaeger custom resource, which defines your Jaeger server configuration. This lets you take advantage of the Fuse Online-provided capability and also tailor Jaeger configuration for your own environment, for example, you can use Elasticsearch or Cassandra for data storage.

To install a hybrid Jaeger client and Jaeger Operator configuration:

- Edit the custom resource before you install Fuse Online as shown in the following example:

```
apiVersion: syndesis.io/v1beta2
kind: Syndesis
metadata:
  name: app
spec:
  addons:
    jaeger:
      enabled: true
      operatorOnly: true
```

- Name the Jaeger custom resource **syndesis-jaeger** as shown in the following example:

```
apiVersion: jaegertracing.io/v1
kind: Jaeger
metadata:
  name: syndesis-jaeger
  ...
spec:
  ....
```

**Note:** Alternately, if you want to use a different name for the Jaeger custom resource, set the **queryUri** and **collectorUri** in the Syndesis custom resource as described in the Client-only/independent server configuration section.

When the Jaeger custom resource with **syndesis-jaeger** name is created, the Jaeger instance collects data from the Fuse Online integrations. By default, this data is not shown in the Fuse Online activity log. To view this data in the Fuse Online activity log, create the following service:

```
oc create -f - <<EOF
```

```

apiVersion: v1
kind: Service
metadata:
  labels:
    app: syndesis
    syndesis.io/app: syndesis
    syndesis.io/type: infrastructure
    syndesis.io/component: jaeger
  name: noauth-syndesis-jaeger-query
spec:
  ports:
    - name: query
      port: 443
      protocol: TCP
      targetPort: 16686
  selector:
    app: jaeger
    app.kubernetes.io/name: syndesis-jaeger
EOF

```

## 1.5. CREATING A SECRET FOR INSTALLING FUSE ONLINE WITH AN EXTERNAL DATABASE

If you want to install a Fuse Online environment that uses an external database to persist connection and integration definitions, create an OpenShift secret, **syndesis-global-config**, before you install Fuse Online.

### Prerequisites

- For OCP 3.11 only, you edited the **default-cr.yml** file to specify the use of an external database to persist connection and integration definitions.
- Fuse Online is not yet installed.
- The **oc** client tool is installed and it is connected to the OCP cluster in which you plan to install Fuse Online.
- A user with cluster administration permissions gave you permission to install Fuse Online in any project that you have permission to access in the cluster.

### Procedure

1. Log in to OpenShift with an account that has permission to install Fuse Online. For example:  
**oc login -u developer -p developer**
2. Create and save a resource file, for example, **my-fuse-online-secret-cr.yml**) that contains the following:

```

apiVersion: v1
kind: Secret
metadata:
  name: syndesis-global-config
  namespace: my-fuse-online-project

```

```

type: Opaque
data:
  POSTGRESQL_PASSWORD: base64-encoded-value

```

Replace **my-fuse-online-project** with the name of the OpenShift project in which you plan to install the Fuse Online environment for which you are specifying an external database.

Replace **base64-encoded-value** with a base64-encoded value that Fuse Online will use as the password for accessing the external database.

For information about OpenShift secrets, see [Secrets](#).

3. Add the secret to the cluster, for example:  
**oc apply -f my-fuse-online-secret-cr.yml**

## Result

In the cluster, the **syndesis-global-config** secret is available to a Fuse Online environment that is installed with a custom resource that specifies an external database.

## Next step

For OCP 4.x, when you install Fuse Online by using the operator, edit the custom resource to specify the use of an external database to persist connection and integration definitions, as described in section [Installing the Fuse Online Operator from the OperatorHub](#).

For OCP 3.11, follow the instructions in [Editing the default custom resource file before installing Fuse Online](#).

## 1.6. INSTALLING FUSE ONLINE

Fuse Online is a flexible and customizable, open source platform that provides core integration capabilities as a service. You can install Fuse Online as an OpenShift developer user (you do not need admin privileges).

Here are the general steps for installing Fuse Online by using the operator:

1. Create a secret in the OpenShift project (namespace) to configure authentication to the Red Hat container registry so that the Fuse Online Operator can access the necessary installation templates.
2. Install the Fuse Online Operator to an OpenShift project (namespace). When the operator is installed, the operator is running in the selected namespace.
3. Create an instance of Fuse Online from the installed operator. You can create an instance with default settings or you can customize the instance by editing the instance's custom resource. You can then access Fuse Online from the provided URL.

The following topics provide details for installing Fuse Online on OCP 4.x by using the operator:

- [Section 1.6.1, "Creating a secret to access the Red Hat registry"](#)
- [Section 1.6.2, "Installing the Fuse Online Operator from the OperatorHub"](#)
- [Section 1.6.3, "Adding a Fuse Online instance to an OpenShift 4.x project"](#)

### 1.6.1. Creating a secret to access the Red Hat registry

On OCP 4.x, before you can install the Fuse Online Operator, for each OpenShift project into which you want to install the Fuse Online Operator, you must configure authentication to the Red Hat container registry by creating a secret.

## Prerequisites

- You have access to the OpenShift cluster on which you want to install Fuse Online.
- You installed the **oc** client tool and it is connected to the OCP cluster on which you plan to install Fuse Online.
- You know your login credentials (username, password, and email address) for either your Red Hat Customer Portal account or your Red Hat Developer Program account. If you do not wish to use your Red Hat account username and password to create a docker registry secret, you can create an authentication token by using a [registry service account](#).

## Procedure

1. In a Terminal window, log in to the OpenShift Server as an administration or as a developer:  
For example, as an administrator:

```
oc login -u system:admin
```

For example, as a developer:

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

2. Change to the OpenShift project where you want to install the operator:

```
oc project fuse-online
```

3. Create a docker-registry secret by using either your Red Hat Customer Portal account or your Red Hat Developer Program account credentials.

```
oc create secret docker-registry syndesis-pull-secret \  
  --docker-server=registry.redhat.io \  
  --docker-username=CUSTOMER_PORTAL_USERNAME \  
  --docker-password=CUSTOMER_PORTAL_PASSWORD \  
  --docker-email=EMAIL_ADDRESS
```

If the command is successful, OpenShift returns the following output:

```
secret/syndesis-pull-secret created
```

## Next steps

After you install the operator (after you have created a subscription and the operator is running in the selected namespace) and before you add a Fuse Online instance, you must link the secret that you created to the operator service account as described in [Section 1.6.2, "Installing the Fuse Online Operator from the OperatorHub"](#).

### 1.6.2. Installing the Fuse Online Operator from the OperatorHub

You can install the Fuse Online Operator from OperatorHub by using the OpenShift Container Platform web console. Follow these steps for each OpenShift project (namespace) in which you want to install Fuse Online.

## Prerequisites

- You have administrator or developer access to the OpenShift cluster.
- You have configured authentication to the Red Hat Container Registry as described in [Creating a secret to access the Red Hat registry](#).
- You installed the **oc** client tool and it is connected to the OCP cluster on which you plan to install Fuse Online.

## Procedure

1. In a web browser, navigate to the OpenShift console in your browser and then log in to the console with your administrator or developer credentials.
2. If you are logged in as an administrator, click **Operators** and then click **OperatorHub**.

If you are logged in as a developer, click **Add** and then click the **From Catalog** card.

3. In the **Filter by keyword** field, type **Fuse Online**.
4. Click the **Red Hat Integration - Fuse Online** card. The **Fuse Online Operator** install page opens.
5. Click **Install**. The **Install Operator** page opens.
  - a. The **Update Channel** defines a stream of updates for the operator and is used to roll out updates for subscribers. The value that you provide depends on your version of OCP 4.x:
    - For OCP 4.6 (and later), type the channel as **fuse-online-7.n** where **n** is the current release number. For example, for Fuse 7.8, type **fuse-online-v7.8**.
  - b. For **Installation mode**, select a namespace (project) from the list of namespaces on the cluster. Select the same namespace that you used when you created a docker registry secret in [Creating a secret to access the Red Hat registry](#) .
  - c. For the **Approval Strategy**, select **Automatic** or **Manual** to configure how OpenShift handles updates to the Fuse Online Operator.
    - If you select **Automatic** updates, when a new version of the Fuse Online Operator is available, the OpenShift Operator Lifecycle Manager (OLM) automatically upgrades the running instance of the Fuse Online without human intervention.
    - If you select **Manual** updates, when a newer version of an operator is available, the OLM creates an update request. A cluster administrator must then manually approve that update request to have the Fuse Online Operator updated to the new version.
6. Click **Install** to make the Fuse Online Operator available in the specified namespace (project).
7. To verify that Fuse Online is installed in the project, click **Operators** and then click **Installed Operators** to see **Red Hat Integration - Fuse Online** in the list.

8. In a Terminal window, type the following command to link the secret (that you created in [Creating a secret to access the Red Hat registry](#) ) to the Fuse Online Operator service account:  
**oc secrets link syndesis-operator syndesis-pull-secret --for=pull**

## Next Steps

After the Fuse Online Operator is installed, you add an instance of Fuse Online to the OpenShift project.

### 1.6.3. Adding a Fuse Online instance to an OpenShift 4.x project

After the Fuse Online Operator is installed in an OpenShift 4.x project, you add an instance of Fuse Online to the OpenShift project. The Fuse Online instance provides the URL that a developer uses to access Fuse Online.

#### Prerequisites

- The Fuse Online Operator is installed into the current OpenShift project.
- On your OCP environment, at least three persistent volumes are available for use by Fuse Online. All of the persistent volumes must have the following configuration requirements:
  - capacity.storage: **1Gi**
  - accessMode: **ReadWriteOnce**
- Decide if you want to install a default Fuse Online instance or customized instance. For more information about the custom resource settings that you can specify, see [When editing the default custom resource is required before installation](#).

#### Procedure

1. Follow these steps to access the **Create Syndesis** page depending on your user role:
  - If you are logged in as an administrator:
    - a. Click **Operators** and then click **Installed Operators**.
    - b. In the **Name** column, click **Red Hat Integration - Fuse Online**. The **Operator Details** page opens.
    - c. Under **Provided APIs**, click **Create Instance**.
  - If you are logged in as a developer:
    - a. Click **Add** and then click the **Operator Backed** card.
    - b. Click the **Syndesis CRD** card. The **Syndesis CRD** page opens.
    - c. Click **Create**.

The **Create Syndesis** page opens.
2. Enter a name or leave **app** as the default.
3. Select the **YAML view** option to view the default custom resource.
4. Optional. Edit the custom resource.



For details on the custom resource settings that you can specify see [When editing the default custom resource is required before installation](#) and [Descriptions of custom resource attributes that configure Fuse Online](#).

The Fuse Online installation process uses the settings that you specify in the custom resource to determine the configuration of the installed Fuse Online environment.

5. Click **Create** to create the Fuse Online instance. OpenShift starts the pods, services, and other components for Fuse Online.
6. To obtain the URL for Fuse Online:
  - a. Click **Networking > Routes**.
  - b. Make sure that the correct project is selected.
  - c. In the **syndesis** row, in the **Location** column, click the URL for Fuse Online.
  - d. Use your OpenShift login credentials to login to the Fuse Online environment.

## CHAPTER 2. INSTALLING FUSE ONLINE ON OCP 3.11

Installation of Fuse Online on OCP 3.11 requires a cluster administrator to register the Fuse Online custom resource definition and grant installation permission to the appropriate user(s). The user who installs Fuse Online must determine whether to install a default Fuse Online environment or a customized Fuse Online environment. For a customized Fuse Online environment, editing of the default custom resource file is required.

Each installation of Fuse Online is referred to as a Fuse Online environment. In a given OpenShift project, there can be exactly one Fuse Online environment. Each Fuse Online environment has its own URL. In a single OpenShift cluster, there can be multiple Fuse Online environments.



### IMPORTANT

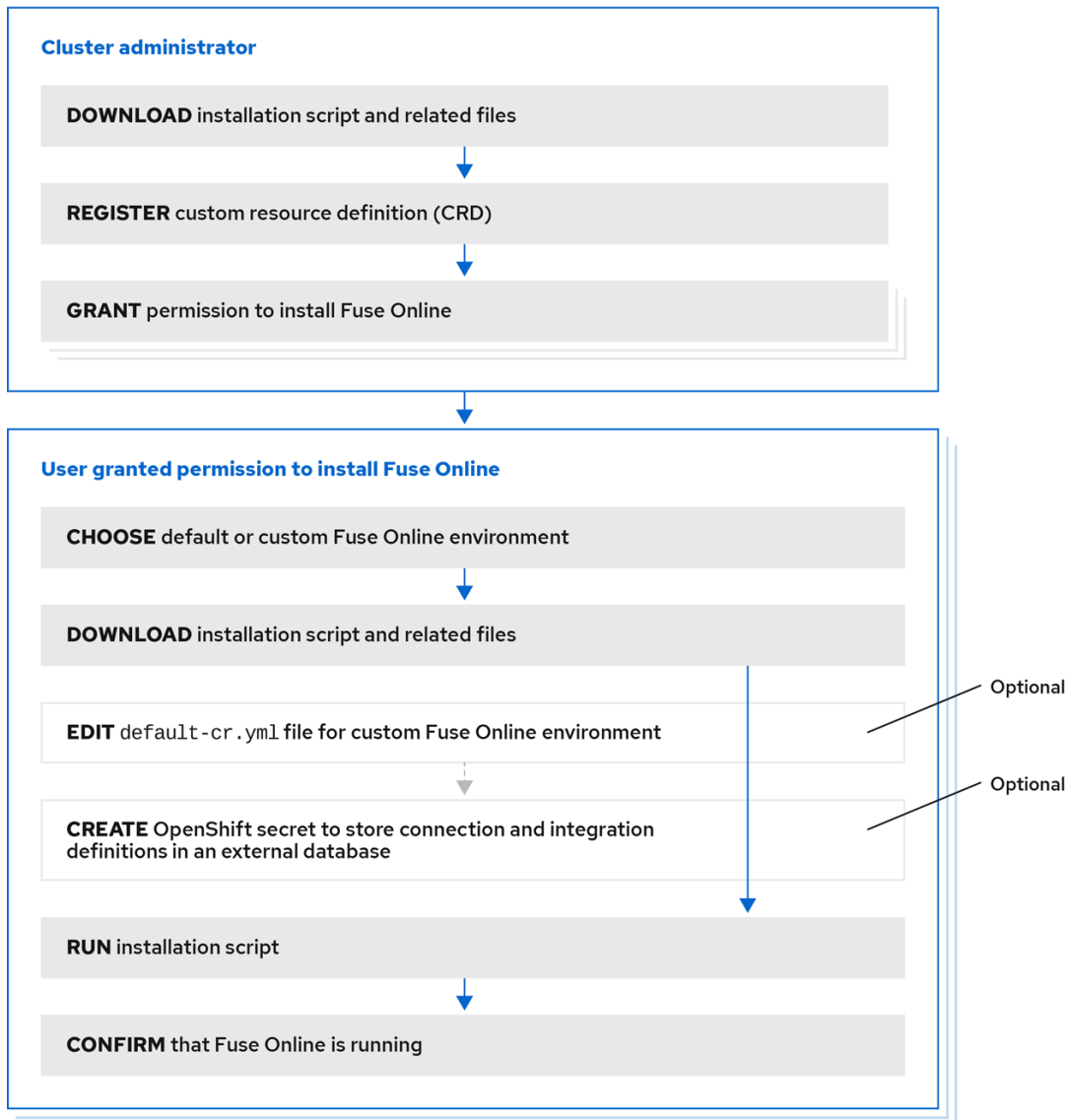
The Fuse Online installation process requires access to [registry.redhat.io](https://registry.redhat.io), which is the Red Hat catalog for container images. Fuse Online does not support or test the use of external container registries, custom registries, or registries in disconnected environments.

The following topics provide details for installing Fuse Online:

- [Section 2.1, "Overview of the steps required to install Fuse Online on OCP 3.11"](#)
- [Section 2.2, "Registering a custom resource definition for deploying Fuse Online resources"](#)
- [Section 2.3, "When editing the default custom resource is required before installing Fuse Online"](#)
- [Section 2.4, "Descriptions of custom resource attributes that configure Fuse Online"](#)
- [Section 2.5, "Editing the default custom resource file before installing Fuse Online"](#)
- [Section 2.6, "About configuring Fuse Online for Jaeger monitoring"](#)
- [Section 2.7, "Creating a secret for installing Fuse Online with an external database"](#)
- [Section 2.8, "Running the script that installs Fuse Online on OCP 3.11"](#)

### 2.1. OVERVIEW OF THE STEPS REQUIRED TO INSTALL FUSE ONLINE ON OCP 3.11

To install Fuse Online on OCP on-site, a cluster administrator must perform some tasks and then a user who has permission to install Fuse Online in a particular OpenShift project performs some tasks and runs the installation script. The following diagram shows the workflow:



83\_Fuse\_0420

## Outline for installing Fuse Online on OCP 3.11 workflow image

To install Fuse Online on OCP, the main steps are:

1. A user with cluster administration permissions:
  - a. Downloads the installation script and related files.
  - b. Registers a custom resource definition (CRD) at the cluster level.
  - c. Grants permission for one or more users to install Fuse Online in their projects.
2. For each OpenShift project in which you want to install Fuse Online, a user who is granted permission to install Fuse Online:
  - a. Decides whether to install a default Fuse Online environment or a customized Fuse Online environment. A customized Fuse Online environment enables one or more add-on features and/or implements one or more custom configuration settings.
  - b. Downloads the installation script and related files.
  - c. Optional. Edits the default-cr.yml file (provided in the Fuse Online download package) if a customized Fuse Online environment is wanted.

- d. Optional. Creates an OpenShift secret if an external database for persisting connection and integration definitions is wanted.
- e. Invokes the installation script.
- f. Confirms that Fuse Online is running.

For each OpenShift project in which Fuse Online is to be installed, the cluster administrator must grant permission to a user to install Fuse Online in that particular project.

To install a default Fuse Online environment, the user with permission to install Fuse Online downloads and runs the installation script. No other steps are required.

### Additional resource

[Fuse Online installation readme file](#)

## 2.2. REGISTERING A CUSTOM RESOURCE DEFINITION FOR DEPLOYING FUSE ONLINE RESOURCES

To enable installation of Fuse Online, a cluster administrator registers a custom resource definition. The administrator needs to do this only once for the OpenShift cluster. Then, for each project in which the administrator wants Fuse Online to be installed, the administrator grants an appropriate user permission to install Fuse Online in that project.

### Prerequisites

- You must have cluster administration permissions.
- You installed the **oc** client tool and it is connected to the OCP cluster into which Fuse Online will be installed.
- On your OCP environment, at least three persistent volumes are available for use by Fuse Online. All of the persistent volumes must have the following configuration requirements:
  - `capacity.storage`: **1Gi**
  - `accessMode`: **ReadWriteOnce**

### Procedure

1. Download the package that contains the Fuse Online installation script from the following location:  
<https://github.com/syndesio/fuse-online-install/releases/tag/1.11>
2. Unpack the downloaded archive at a convenient location on your file system. The **fuse-online-install-1.11** directory contains the script and supporting files for installing Fuse Online.
3. Confirm that you are properly connected by running the following command, which lists any custom resource definitions that are already registered in this cluster.

```
oc get crd
```

You are properly connected if there is no error message.

4. Register the custom resource definition at the cluster level by switching to the **fuse-online-install-1.11** directory and invoking the following command:

```
bash install_ocp.sh --setup
```

5. Confirm that registration was successful by running the following command again:  
**oc get crd**

The output list of registered custom resource definitions should include **syndesis**.

6. In each project in which you want Fuse Online to be installed, grant installation permission to a user. For each project:
  - a. Change to the project in which you want a user to be able to install Fuse Online. For example:  
**oc project fuse-online-project**
  - b. Grant a user permission to install Fuse Online in that project. For example, the following command grants permission to install Fuse Online to **developer** user. After running this command, the **developer** user can install Fuse Online in the current project, which is **fuse-online-project** in this example:  
**bash install\_ocp.sh --grant developer**

Repeat these two commands for each OpenShift project in which you want to grant permission for Fuse Online installation. A single user can install Fuse Online in more than one project in the cluster. To enable this, change to another project and specify the same user, for example:

```
oc project another-fuse-online-project  
bash install_ocp.sh --grant developer
```

## Result

The **syndesis** custom resource definition is registered in the cluster.

## Next steps

Users with permission to install Fuse Online must decide whether to install a default Fuse Online environment or a customized Fuse Online environment.

## 2.3. WHEN EDITING THE DEFAULT CUSTOM RESOURCE IS REQUIRED BEFORE INSTALLING FUSE ONLINE

The Fuse Online installation includes a default custom resource, which specifies the default settings for configurable Fuse Online environment add-on features and parameter settings.

You need to edit the default custom resource before you install Fuse Online if you want the installed Fuse Online environment to:

- Use a URL that you specify for the OpenShift route by which the Fuse Online console can be reached. The default is that the installation process calculates this route.
- Use an external database to store connection and integration definitions. The default is that the environment uses an internal database.
- Increase the amount of internal storage that is available for persisting connection and integration definitions. The default, which is **1Gi**, is sufficient for most Fuse Online environments.

To configure a Fuse Online environment for any one of these behaviors, you **MUST** edit the custom

resource when you install Fuse Online. In other words, you cannot change the configuration of an installed Fuse Online environment to implement any of these behaviors. Also, after you install a Fuse Online environment that is configured for any of these behaviors, you cannot change that behavior in the installed environment.

## 2.4. DESCRIPTIONS OF CUSTOM RESOURCE ATTRIBUTES THAT CONFIGURE FUSE ONLINE

In addition to the custom resource attributes that you can specify only before installation, there are a number of custom resource attributes that you can change before or after installation.

Table 1 provides a brief description of configurable custom resource settings and indicates when you can change them: before and/or after installation. To achieve the Fuse Online configuration that you want, use the information in this table to determine how you need to change the custom resource before installation or how you want to change it after installation. Then follow the appropriate procedure:

### For OCP 4.x:

- [Adding a Fuse Online instance to an OpenShift 4.x project](#)
- [General procedure for changing Fuse Online configuration](#)

### For OCP 3.11:

- [Editing the default custom resource file before installing Fuse Online](#)
- [General procedure for changing Fuse Online configuration](#)

Table 2.1. Configurable custom resource settings

Feature/Setting	When you can set this	Specification
<p><b>Enhanced activity tracking</b></p> <p>Additional information about enhanced activity tracking follows this table.</p>	Set only before installation	<p><b>addons:</b>  <b>jaeger:</b>  <b>enabled: true</b>  <b>clientOnly: false</b>  <b>operatorOnly: false</b></p> <p>Enhanced activity tracking is enabled, by default. If you want to customize the Jaeger configuration, you can set <b>clientOnly</b> or <b>operatorOnly</b> to <b>true</b>.</p>

Feature/Setting	When you can set this	Specification
<p><b>External database</b></p> <p>Additional information about using an external database follows this table.</p>	<p>Set only before installation</p>	<p><b>spec:</b>  <b>components:</b>  <b>database:</b>  <b>externalDbURL: postgresql://custom-postgres:5432</b>  <b>user: db-user-name</b>  <b>name: db-name</b></p> <p>Replace <b>custom-postgres:5432</b> with the host name and port for a PostgreSQL database.  Replace <b>db-user-name</b> with the name of a user account that can access that database.  Replace <b>db-name</b> with the name of the database.</p>
<p><b>Internal storage capacity</b> for connections and integrations.</p> <p>Ignored if you also specify an external database.</p> <p>Additional information about increasing internal storage follows this table.</p>	<p>Set only before installation</p>	<p><b>spec:</b>  <b>components:</b>  <b>database:</b>  <b>resources:</b>  <b>volumeCapacity: 1Gi</b>  <b>volumeName: my-volume</b></p> <p>Replace <b>1Gi</b> with the amount of storage you need. The default is <b>1Gi</b>.</p> <p>Replace <b>my-volume</b> with the name of the volume to use for internal storage. This parameter is optional.</p>
<p><b>OpenShift route</b> for accessing Fuse Online console</p>	<p>Set only before installation</p>	<p><b>spec:</b>  <b>routeHostname: project.route.com</b></p> <p>Replace <b>project.route.com</b> with the OpenShift route by which the Fuse Online console can be reached.  For example: <b>north-project.6a63.fuse-online.openshiftapps.com</b></p>

Feature/Setting	When you can set this	Specification
<p><b>Memory and CPU</b></p> <p>Increase the default amount of memory that is available to one or more components.</p> <p>Each component defines its own memory requirement, which means that each pod has a limit on the amount of memory it is assigned. For information about limit and request settings, see the section on <a href="#">Configuring cluster memory to meet container memory and risk requirements</a> in the OpenShift documentation.</p> <p>You can also specify CPU resources for the <b>server</b> component.</p> <p>The <b>database</b> component is the internal database that stores connection and integration definitions.</p> <p>The <b>meta</b> component provides the business logic, such as the connectors, which the server loads.</p> <p>The <b>prometheus</b> component monitors Fuse Online infrastructure components and Fuse Online integrations.</p>	<p>Set only before installation</p>	<p><b>components:</b></p> <p><b>server:</b></p> <p><b>resources:</b></p> <p><b>limit:</b></p> <p><b>memory: "1024Mi"</b></p> <p><b>cpu: "800m"</b></p> <p><b>request:</b></p> <p><b>memory: "512Mi"</b></p> <p><b>cpu: "500m"</b></p> <p><b>meta:</b></p> <p><b>resources:</b></p> <p><b>limit:</b></p> <p><b>memory: "750Mi"</b></p> <p><b>request:</b></p> <p><b>memory: "300Mi"</b></p> <p><b>database:</b></p> <p><b>resources:</b></p> <p><b>limit:</b></p> <p><b>memory: "300Mi"</b></p> <p><b>request:</b></p> <p><b>memory: "300Mi"</b></p> <p><b>prometheus:</b></p> <p><b>resources:</b></p> <p><b>limit:</b></p> <p><b>memory: "750Mi"</b></p> <p><b>request:</b></p> <p><b>memory: "750Mi"</b></p>
<p><b>3scale discovery</b></p> <p>Expose APIs for Fuse Online API provider integrations so that they are discoverable by Red Hat 3scale.</p> <p>More information: <a href="#">Configuring Fuse Online to enable 3scale discovery of APIs</a>.</p>	<p>Set before or after installation</p>	<p><b>components:</b></p> <p><b>server:</b></p> <p><b>features:</b></p> <p><b>managementUriFor3scale: https://url-for-3scale</b></p> <p>Specify the URL for your 3scale user interface.</p>



Feature/Setting	When you can set this	Specification
<p><b>Backups</b></p> <p>Additional setup steps are described in <a href="#">Backing up a Fuse Online environment</a>.</p>	<p>Set before or after installation</p>	<p><b>spec:</b>  <b>backup:</b>  <b>schedule: interval</b></p> <p>Replace <b>interval</b> with the desired duration between backups. Use <b>cron</b> utility format for <a href="#">intervals</a> and <a href="#">predefined schedules</a>. Do not specify the <b>@</b> sign in front of the interval.</p>
<p><b>Node affinity and tolerations</b></p> <p>Determines the placement of Fuse Online infrastructure component and integration pods onto nodes within the cluster.</p> <p>Node affinity allows you to specify an affinity for Fuse Online pods towards a group of nodes to be placed on.</p> <p>Tolerations allows you to control which nodes the Fuse Online pods run on and to prevent other workloads from using those nodes.</p> <p>See also: <a href="#">Configuring Fuse Online pods</a>.</p>	<p>Set before or after installation</p>	<p><b>Note:</b> Use <b>infraScheduling</b> for Fuse Online infrastructure component deployments. For Fuse Online integration deployments, replace <b>infraScheduling</b> with <b>integrationScheduling</b>.</p> <p><b>spec:</b>  <b>infraScheduling:</b>  <b>tolerations:</b>  <b>key: value</b>  <b>operator: value</b>  <b>effect: value</b></p> <p><b>spec:</b>  <b>infraScheduling:</b>  <b>affinity:</b>  <b>nodeAffinity:</b>  <b>preferredDuringSchedulingIgnoredDuringExecution:</b>  <b>weight:</b>  <b>preference:</b>  <b>matchExpressions:</b>  <b>key: value</b>  <b>operator: value</b>  <b>values:</b>  <b>value1,</b>  <b>value2</b></p>
<p><b>Integration limit</b></p> <p>Specify the maximum number of running integrations. The default, <b>0</b>, does not limit the number of running integrations.</p>	<p>Set before or after installation</p>	<p><b>components:</b>  <b>server:</b>  <b>features:</b>  <b>integrationLimit: 0</b></p>

Feature/Setting	When you can set this	Specification
<p><b>Database connection pool</b></p> <p>You can adjust the server connection pool configuration to manage the connections to the database.</p> <p>Additional information about the database pool configuration follows this table.</p>	Set before or after installation	<p><b>components:</b></p> <p><b>server:</b></p> <p><b>connectionPool:</b></p> <p><b>connectionTimeout: 30000</b></p> <p><b>idleTimeout: 600000</b></p> <p><b>leakDetectionThreshold: 0</b></p> <p><b>maxLifetime: 1800000</b></p> <p><b>maximumPoolSize: 10</b></p> <p><b>minimumIdle: 10</b></p>
<p><b>Java Options</b></p> <p>You can specify Java options for the <b>syndesis-server</b> and <b>syndesis-meta</b> components.</p> <p>Depending on the Java option, you can specify different values for the components. For example, you can set a JVM-related parameter for <b>syndesis-server</b> only, because it requires more computer resources than <b>syndesis-meta</b>.</p>	Set before or after installation	<p><b>components:+ server:</b></p> <p><b>javaOptions:</b></p> <p><b>-option_name=my_value meta:</b></p> <p><b>javaOptions:</b></p> <p><b>-option_name=my_value</b></p> <p>Replace <b>-option_name</b> with the Java option name. You can specify any Java option prefix (<b>-D</b>, <b>-X</b>, or <b>-XX</b>).</p> <p>Replace <b>my_value</b> with value for the option.</p> <p>For example, to configure the HTTP proxy:</p> <pre>components:+ server:   javaOptions:     -Dhttp.proxyHost=10.0.0.100 - Dhttp.proxyPort=8800 meta:   javaOptions:     -Dhttp.proxyHost=10.0.0.100 - Dhttp.proxyPort=8800`</pre>
<p><b>Maven Arguments</b></p> <p>Specify additional Maven options to use when building Fuse Online integrations.</p>	Set before or after installation	<p><b>components:</b></p> <p><b>server:</b></p> <p><b>features:</b></p> <p><b>maven:</b></p> <p><b>additionalArguments:</b></p> <p><b>"typeA=stringA typeB=stringB"</b></p> <p>For example:</p> <p><b>additionalArguments:</b></p> <p><b>"-Dhttp.proxy=my_proxy -DpropA=valueA"</b></p>

Feature/Setting	When you can set this	Specification
<p><b>Maven Repositories</b></p> <p>Specify external Maven repositories that your Fuse Online environment needs to access.</p>	Set before or after installation	<p><b>components:</b></p> <p><b>server:</b></p> <p><b>features:</b></p> <p><b>mavenRepositories:</b></p> <p><b>customRepo1:</b> <code>https://customRepo1</code></p> <p><b>customRepo2:</b> <code>https://customRepo2</code></p> <p>Replace <b>customRepo</b> with the name of a repository.</p> <p>For each repository, specify its URL.</p>
<p><b>Monitoring</b></p> <p>See also: <a href="#">Monitoring Fuse Online integrations on OCP with Prometheus</a>.</p>	Set before or after installation	<p><b>addons:</b></p> <p><b>ops:</b></p> <p><b>enabled:</b> <code>true</code></p>
<p><b>Public REST API</b></p> <p>Additional set-up steps are described in <a href="#">Exposing Fuse Online public REST API endpoints for use by external tools</a>.</p>	Set before or after installation	<p><b>addons:</b></p> <p><b>publicApi:</b></p> <p><b>enabled:</b> <code>true</code></p> <p><b>routeHostname:</b> <code>public-syndesis.192.168.64.63.nip.io</code></p> <p>Set <b>routeHostname</b> to the public address for invoking Fuse Online REST API endpoints. Your cluster setup determines the public address that you need to specify. In the previous example, the route host name is valid for a minishift cluster.</p>
<p><b>ToDo app</b></p> <p>For testing sample integrations.</p>	Set before or after installation	<p><b>addons:</b></p> <p><b>todo:</b></p> <p><b>enabled:</b> <code>false</code></p> <p><b>Note:</b> For installing Fuse Online in a restricted environment, you must make sure that the <b>todo</b> addon is set to <b>false</b> (the default) before installation. After installing Fuse Online, you can optionally download the todo application from <a href="https://github.com/syndesisio/todo-example">https://github.com/syndesisio/todo-example</a> and follow the steps in the <b>Readme</b> file, changing the repository URL to a location available on your private network.</p> <p>See also <a href="#">Adding a sample app to a Fuse Online environment running on OCP</a>.</p>

## About add-on features and configuration settings

- **Enhanced activity tracking**

Activity tracking, using Jaeger, is enabled by default when you install Fuse Online. The Fuse Online installation (from the OperatorHub or the command-line script) detects the existence of

the OperatorHub and installs Jaeger by using the OperatorHub's subscription functionality. For the limited circumstances in which the OperatorHub is not available, Fuse Online uses its own installation functions to install Jaeger. Optionally, you can customize the Jaeger configuration before you install Fuse Online as described in the [About configuring Fuse Online for Jaeger monitoring](#) section.

- **External database for persisting connections and integrations**

A default installation of Fuse Online provides an internal PostgreSQL database that Fuse Online uses to persist connection and integration definitions. You can choose to use an external PostgreSQL database instead, such as [Amazon RDS for PostgreSQL](#).

- **Internal storage capacity**

The default setting of **1Gi** is sufficient for most Fuse Online environments. It is expected that you would increase this setting for a new Fuse Online installation only upon the recommendation of Red Hat technical support. That is, you have been running another Fuse Online environment in which you encountered Fuse Online server errors and Red Hat technical support determined that you need to install a new Fuse Online environment with a database volume capacity that is larger than the default.

To increase Fuse Online internal storage capacity in an OpenShift project that is already running Fuse Online, you must first uninstall Fuse Online. See [Uninstalling Fuse Online from an OCP project](#).

- **Database connection pool configuration**

You can configure the following **syndesis-server** database connection pool properties:

- **connectionTimeout** - The maximum number of milliseconds that the **syndesis-server** waits for a connection from the pool. The lowest acceptable connection timeout is 250 ms. The default is 30000 (30 seconds).
- **idleTimeout** - The maximum amount of time (in milliseconds) that a connection is allowed to sit idle in the pool before the connection is removed. A value of 0 means that idle connections are never removed from the pool. The minimum allowed value is 10000 (10 seconds). The default is 600000 (10 minutes),
- **leakDetectionThreshold** - The amount of time (in milliseconds) that a connection can be out of the pool before a message is logged indicating a possible connection leak. A value of 0 means leak detection is disabled. The lowest acceptable value for enabling leak detection is 2000 (2 seconds). The default is 0.
- **maxLifetime** - The maximum lifetime (in milliseconds) of a connection in the pool. The minimum allowed value is 30000 (30 seconds). The default is 1800000 (30 minutes).
- **maximumPoolSize** - The maximum size that the pool is allowed to reach, including both idle and in-use connections. The default is 10.
- **minimumIdle** - The minimum number of idle connections maintained in the pool. The default is the value of **maximumPoolSize**.

## 2.5. EDITING THE DEFAULT CUSTOM RESOURCE FILE BEFORE INSTALLING FUSE ONLINE

To install a default Fuse Online environment, you do not need to edit the default custom resource file. See [Installing Fuse Online on OCP 4.x](#) or [Installing Fuse Online on OCP 3.11](#).

To install a customized Fuse Online environment, you must edit the **default-cr.yml** file before you install

Fuse Online. This file is in the Fuse Online download package. There are some custom resource settings that you can specify only before Fuse Online installation. See [When editing the default custom resource is required before installation](#).

There are other custom resource settings that you can specify before or after Fuse Online installation. See [Descriptions of custom resource attributes that configure Fuse Online](#).

The Fuse Online installation process uses the settings that you specify in the **default-cr.yml** file to create the **syndesis** custom resource. The **syndesis** custom resource settings determine the configuration of the installed Fuse Online environment.

### Prerequisites

- You plan to install and run Fuse Online on OCP on-site.
- The **oc** client tool is installed and it is connected to the OCP cluster in which you plan to install Fuse Online
- A user with cluster administration permissions gave you permission to install Fuse Online in any project that you have permission to access in the cluster.

### Procedure

1. If you did not already download the package that contains the Fuse Online installation scripts:
  - a. Download it now from the following location:  
<https://github.com/syndesio/fuse-online-install/releases/tag/1.11>
  - b. Unpack the downloaded archive at a convenient location on your file system. The **fuse-online-install-1.11** directory contains the scripts and supporting files for installing Fuse Online.
2. Log in to OpenShift with an account that has permission to install Fuse Online. For example:  
**oc login -u developer -p developer**
3. Open the **fuse-online-install-1.11/default-cr.yml** file in an editor.
4. Edit the **default-cr.yml** file so that it enables the features and sets the parameters that you want. To determine what you need to specify, see [Descriptions of custom resource attributes that configure Fuse Online](#).
5. Save the **default-cr.yml** file.

### Result

The **default-cr.yml** file contains the configuration specifications for a new Fuse Online installation.

### Next steps

If you edited the **default-cr.yml** file to specify an external database then follow the instructions in [Creating a secret for installing Fuse Online with an external database](#) before you install Fuse Online. Otherwise, you are ready to follow the instructions in [Installing Fuse Online on OCP 3.11](#).

## 2.6. ABOUT CONFIGURING FUSE ONLINE FOR JAEGER MONITORING

Jaeger is open source software for tracing transactions between distributed services. It is especially useful for monitoring and troubleshooting complex microservices environments.

When you install Fuse Online, either from the OperatorHub or by using the command-line script, the Fuse Online installation detects the existence of the OperatorHub and installs Jaeger by using the OperatorHub's subscription functionality. For the limited circumstances in which the OperatorHub is not available, Fuse Online uses its own installation functions to install Jaeger.

A default Fuse Online environment configures all needed Jaeger components. Optionally, you can edit the Fuse Online custom resource to specify a client-only/independent server configuration or a hybrid Jaeger client and Jaeger Operator configuration.

## Default Jaeger configuration

The basic, out-of-the-box, configuration includes all Jaeger components. You can start learning about how Jaeger works by experimenting with its monitoring capabilities. The default configuration provides a memory-only, limited, backend storage capability.

Installing Fuse Online with the default Jaeger configuration has the following results:

- Fuse Online components have Jaeger communication URLs.
- Jaeger Operator is installed.
- Jaeger custom resource is configured with a default configuration for activity monitoring.

A Fuse Online installation with the default Jaeger configuration, has the following **syndesis** custom resource specification:

```
apiVersion: syndesis.io/v1beta2
kind: Syndesis
metadata:
  name: app
spec:
  addons:
    jaeger:
      enabled: true
```

When the **clientOnly** and **operatorOnly** are unspecified (set to **false**, by default) Fuse Online uses the provided Jaeger backend as well as the default, memory-only storage provided by the Jaeger server configuration.

## Client-only/independent server configuration

With a client-only/independent server configuration, only client URL connections are configured for communication between Fuse Online and an externally configured Jaeger backend. All aspects of the Jaeger backend are external and independent of the Fuse Online environment and **syndesis-operator**. This includes the Jaeger Operator and the Jaeger custom resource.

To install a client-only Jaeger configuration, edit the custom resource before you install Fuse Online as follows:

- Set **clientOnly** to **true** to add [Jaeger agent capabilities](#).
- Set **queryUri** to the URI of the [query component](#) of the independently installed Jaeger backend.
- Set **collectorUri** to the URI of the [collector component](#) of the independently installed Jaeger backend.

For example:

```
apiVersion: syndesis.io/v1beta2
kind: Syndesis
metadata:
  name: app
spec:
  addons:
    jaeger:
      enabled: true
      clientOnly: true
      queryUri: http://jaeger-query-hostname:443/api
      collectorUri: http://jaeger-collector-hostname:14268/api/traces
```

## Hybrid Jaeger client and operator configuration

With a hybrid Jaeger client and Jaeger Operator configuration, Fuse Online installs the Jaeger Operator as well as the Jaeger client capabilities. A Jaeger custom resource is not installed. You must install your own Jaeger custom resource, which defines your Jaeger server configuration. This lets you take advantage of the Fuse Online-provided capability and also tailor Jaeger configuration for your own environment, for example, you can use Elasticsearch or Cassandra for data storage.

To install a hybrid Jaeger client and Jaeger Operator configuration:

- Edit the custom resource before you install Fuse Online as shown in the following example:

```
apiVersion: syndesis.io/v1beta2
kind: Syndesis
metadata:
  name: app
spec:
  addons:
    jaeger:
      enabled: true
      operatorOnly: true
```

- Name the Jaeger custom resource **syndesis-jaeger** as shown in the following example:

```
apiVersion: jaegertracing.io/v1
kind: Jaeger
metadata:
  name: syndesis-jaeger
  ...
spec:
  ....
```

**Note:** Alternately, if you want to use a different name for the Jaeger custom resource, set the **queryUri** and **collectorUri** in the Syndesis custom resource as described in the Client-only/independent server configuration section.

When the Jaeger custom resource with **syndesis-jaeger** name is created, the Jaeger instance collects data from the Fuse Online integrations. By default, this data is not shown in the Fuse Online activity log. To view this data in the Fuse Online activity log, create the following service:

```
oc create -f - <<EOF
```

```

apiVersion: v1
kind: Service
metadata:
  labels:
    app: syndesis
    syndesis.io/app: syndesis
    syndesis.io/type: infrastructure
    syndesis.io/component: jaeger
  name: noauth-syndesis-jaeger-query
spec:
  ports:
    - name: query
      port: 443
      protocol: TCP
      targetPort: 16686
  selector:
    app: jaeger
    app.kubernetes.io/name: syndesis-jaeger
EOF

```

## 2.7. CREATING A SECRET FOR INSTALLING FUSE ONLINE WITH AN EXTERNAL DATABASE

If you want to install a Fuse Online environment that uses an external database to persist connection and integration definitions, create an OpenShift secret, **syndesis-global-config**, before you install Fuse Online.

### Prerequisites

- For OCP 3.11 only, you edited the **default-cr.yml** file to specify the use of an external database to persist connection and integration definitions.
- Fuse Online is not yet installed.
- The **oc** client tool is installed and it is connected to the OCP cluster in which you plan to install Fuse Online.
- A user with cluster administration permissions gave you permission to install Fuse Online in any project that you have permission to access in the cluster.

### Procedure

1. Log in to OpenShift with an account that has permission to install Fuse Online. For example:  
**oc login -u developer -p developer**
2. Create and save a resource file, for example, **my-fuse-online-secret-cr.yml**) that contains the following:

```

apiVersion: v1
kind: Secret
metadata:
  name: syndesis-global-config
  namespace: my-fuse-online-project

```



```

type: Opaque
data:
  POSTGRESQL_PASSWORD: base64-encoded-value

```

Replace **my-fuse-online-project** with the name of the OpenShift project in which you plan to install the Fuse Online environment for which you are specifying an external database.

Replace **base64-encoded-value** with a base64-encoded value that Fuse Online will use as the password for accessing the external database.

For information about OpenShift secrets, see [Secrets](#).

3. Add the secret to the cluster, for example:  
**oc apply -f my-fuse-online-secret-cr.yml**

## Result

In the cluster, the **syndesis-global-config** secret is available to a Fuse Online environment that is installed with a custom resource that specifies an external database.

## Next step

For OCP 4.x, when you install Fuse Online by using the operator, edit the custom resource to specify the use of an external database to persist connection and integration definitions, as described in section [Installing the Fuse Online Operator from the OperatorHub](#).

For OCP 3.11, follow the instructions in [Editing the default custom resource file before installing Fuse Online](#).

## 2.8. RUNNING THE SCRIPT THAT INSTALLS FUSE ONLINE ON OCP 3.11

The Fuse Online installation script installs a Fuse Online environment according to the specifications in the **default-cr.yml** file, which is in the Fuse Online download package. To install a default environment, no editing of that file is required. To install a customized environment, you must edit the **default-cr.yml** file before you run the installation script.

### Prerequisites

- OCP is running on-site.
- The **oc** client tool is installed and connected to the OCP cluster in which you want to install Fuse Online.
- A user with cluster administration permissions gave you permission to install Fuse Online in the project in which you plan to install Fuse Online.
- If you determined that you needed to edit the **default-cr.yml** file before installation, you completed those edits. ([When editing the default custom resource file is required before installing Fuse Online](#))
- If the edited **default-cr.yml** file specifies an external database for persisting connection and integration definitions, you created an OpenShift secret for accessing the external database. ([Creating a secret for installing Fuse Online with an external database](#))
- You have a [Red Hat developer](#) account for which you know your user name and password. The installation script prompts you for these credentials so it can authenticate you against <https://developers.redhat.com>. For details about creating an account, see [Accessing and](#)

## Configuring the Red Hat Registry.

### Procedure

1. If you did not already download the package that contains the Fuse Online installation scripts:
  - a. Download it from the following location:  
<https://github.com/syndesisio/fuse-online-install/releases/tag/1.11>
  - b. Unpack the downloaded archive at a convenient location on your file system. The **fuse-online-install-1.11** directory contains the scripts and supporting files for installing Fuse Online.
2. Log in to OpenShift with an account that has permission to install Fuse Online. For example:  
**oc login -u developer -p developer**

3. Switch to the OpenShift project into which you want to install Fuse Online, for example:  
**oc project my-fuse-online-project**

Alternatively, when you run the installation script, you can specify, for example, **--project my-fuse-online-project**.

4. In the directory in which you downloaded the installation script, invoke the installation script:  
**bash install\_ocp.sh**

To learn about the installation script options, invoke the **bash install\_ocp.sh --help** command.

5. Confirm that the **syndesis** custom resource that **syndesis-operator** used to install Fuse Online contains exactly the content that you want:

- a. Invoke the following command to display the **syndesis** custom resource content:  
**oc describe syndesis/app**

- b. Check the content of the custom resource.

If it does not contain all of your updates, then there was probably a syntax error in the custom resource. You must uninstall Fuse Online and try again to define a valid custom resource. See [Uninstalling Fuse Online from an OCP project](#) .

6. Confirm that installation was successful:

- a. Display the OpenShift OAuth proxy log-in page at **https://openshift-route**.

If you chose to let the installation script calculate the OpenShift route, then the script displays the calculated route near the end of its execution. Replace **openshift-route** with the value that the script provided.

If you edited the **default-cr.yml** file to specify the **routeHostname** for Fuse Online, replace **openshift-route** with the route that you specified.

- b. If you are not already logged in to the OpenShift console, its log-in page appears. Enter your OpenShift user name and password to log in.

The Fuse Online home page appears either immediately or after you log in to the OpenShift console.

### Additional resource

[Fuse Online installation readme file](#)

## CHAPTER 3. CHANGING THE CONFIGURATION OF A FUSE ONLINE ENVIRONMENT

After you install Fuse Online on OpenShift Container Platform (OCP) on-site, you can change the configuration of the Fuse Online environment.

See the following topics for details:

- [Section 3.1, “Fuse Online configuration changes allowed after installation”](#)
- [Section 3.2, “General procedure for changing Fuse Online configuration”](#) .
- Configuring {proddname} and 3scale discovery of APIs:
  - [Section 3.3.1, “Configuring Fuse Online to enable 3scale discovery of APIs”](#)
  - [Section 3.3.2, “Configuring Fuse Online to disable 3scale discovery of APIs”](#)
- [Section 3.5, “Configuring the HTTP proxy”](#)
- [Section 3.6, “Adding a sample app to a Fuse Online environment running on OCP”](#)

### 3.1. FUSE ONLINE CONFIGURATION CHANGES ALLOWED AFTER INSTALLATION

After you install Fuse Online on OpenShift Container Platform (OCP) on-site, you can change its configuration to enable/disable some features or change some configuration settings. The following table lists the features and settings that you can change, the effect of the change, and where to find instructions for making the change.

When changes to the **syndesis** custom resource cause redeployment of **syndesis-server** or when you delete the **syndesis-server** pod, OpenShift creates a new server pod. It takes a maximum of one to two minutes until the new server is ready. During this time, the Fuse Online console is not usable. Integrations that are running continue to run while a new server is being deployed. When the new deployment is ready, the new server loads the state of the integrations. You can use the Fuse Online console again when the **syndesis-server** pod status is **Running** and refreshing the Fuse Online console displays values for integrations, connections, messages, and uptime.

**Table 3.1. Features and settings that you can change**

Feature/Setting	Effect of changing	Information
3scale discovery	Redploys <b>syndesis-server</b>	<a href="#">Configuring Fuse Online to enable 3scale discovery of APIs</a>
Backups	Adds a backup job to <b>syndesis-operator</b>	<a href="#">Backing up a Fuse Online environment</a>
Monitoring	Installs new OpenShift resources	<a href="#">Monitoring Fuse Online integrations on OCP with Prometheus</a>

Feature/Setting	Effect of changing	Information
Public Fuse Online REST API endpoints	Creates <b>syndesis-public-<a href="#">oauthproxy</a></b> pod	<a href="#">Exposing Fuse Online public REST APIs for use by external tools</a>
Sample Todo app for testing integrations	Creates new <b>todo</b> pod	<a href="#">Adding a sample app to a Fuse Online environment running on OCP</a>
Java options	Redeploys <b>syndesis-server</b>	<a href="#">Descriptions of custom resource attributes that configure Fuse Online</a>
Maven configuration	You must delete the <b>syndesis-server</b> pod to trigger its redeployment.	<a href="#">Configuring the HTTP proxy</a>
Assigning Fuse Online pods to OpenShift cluster nodes	Redeploys Fuse Online infrastructure component and integration pods	<a href="#">Descriptions of custom resource attributes that configure Fuse Online</a>  <a href="#">Configuring Fuse Online pods</a>
Memory available to Fuse Online components	Redeploys component with changed memory	<a href="#">Descriptions of custom resource attributes that configure Fuse Online</a>
Number of running integrations allowed	You must delete the <b>syndesis-server</b> pod to trigger its redeployment.	
Database connection pool	Redeploys <b>syndesis-server</b>	

## 3.2. GENERAL PROCEDURE FOR CHANGING FUSE ONLINE CONFIGURATION

For a Fuse Online environment that is installed on OCP, you can change its configuration by updating its **syndesis** custom resource. After you save your changes, OpenShift updates **syndesis-operator** with your updates if they are syntactically correct. A syntax error prevents the update.

While editing the **syndesis** custom resource, ensure that you do not specify an invalid setting that is syntactically correct. The **syndesis-operator** will use the updated **syndesis** custom resource even if a syntactically correct setting is invalid. If you do specify an invalid setting, you learn about it only after OpenShift completes the update. During the update, OpenShift deletes invalid settings.

### Prerequisites

- Fuse Online is installed on OCP on-site.
- The **oc** client tool is installed and it is connected to the OCP cluster in which Fuse Online is installed.
- You have permission to install Fuse Online in the project for which you want to change Fuse Online configuration.

- You consulted [Descriptions of custom resource attributes that configure Fuse Online](#) to learn which configuration changes are allowed after installation and how to update the **syndesis** custom resource for the configuration changes you want to make.

## Procedure

1. Log in to OpenShift with an account that has permission to install Fuse Online. For example:  
**oc login -u developer -p developer**
2. Switch to the OpenShift project that is running the Fuse Online environment whose configuration you want to change. For example:  
**oc project my-fuse-online-project**
3. Optional. Create a backup copy of the current settings in the **syndesis** custom resource, just in case you update and save incorrect content. For example, invoking the following command saves a backup in the **syndesis\_app\_backup.yml** file:  
**oc get syndesis app -o yaml > syndesis\_app\_backup.yml**
4. Invoke the following command to open the **syndesis** custom resource in an editor:  
**oc edit syndesis/app**

**Note:** This procedure describes how to set configurations by opening the custom resource file in an editor. Alternatively, you can use **oc patch** commands to edit the custom resource.

5. Edit the **syndesis** custom resource as needed.
6. Save the resource.  
Depending on the type of object that your edits apply to, your update triggers the **syndesis-operator** to redeploy some Fuse Online components when you save the resource.
7. If you made changes to the **maven:additionalArguments**, **MavenRepositories**, and **integrationLimit** attributes in the **components.server.features** section of the custom resource, you must trigger the redeployment by deleting the **syndesis-server** pod. Use this command:  
**oc delete 'oc get -o name pod -l syndesis.io/component=syndesis-server'**
8. Wait two or three minutes, and then confirm that the **syndesis** custom resource was updated correctly:
  - a. Invoke the following command to display the content of the **syndesis** custom resource:  
**oc describe syndesis/app**
  - b. Check the content.  
If the **syndesis** custom resource does not contain the settings that you need, edit it again to specify valid settings.

## Results

Most changes to the **syndesis** custom resource trigger **syndesis-operator** to redeploy the Fuse Online **syndesis-server** component. This means that OpenShift creates a new server pod. Some changes require you to delete the **syndesis-server** pod so that OpenShift creates a new server pod.

It takes a maximum of one to two minutes until the new server is ready. During this time, the Fuse Online console is not usable. Integrations that are running continue to run while a new server is being deployed. When the new deployment is ready, the new server loads the state of the integrations. You can use the Fuse Online console again when:

- The **syndesis-server** pod status is **Running**.
- Refreshing the Fuse Online console displays values for integrations, connections, messages, and uptime.

Some changes to the **syndesis** custom resource update the Fuse Online configuration but do not require redeployment of **syndesis-server**. For example:

- When you update the **syndesis** custom resource to specify backups, it is a few seconds before the backup job is in place.

The effect of each configuration change is described in [Fuse Online configuration changes allowed after installation](#).

### 3.3. CONFIGURING FUSE ONLINE AND 3SCALE DISCOVERY OF APIS

If you create an API provider integration, you might want to enable discovery of the API for that integration in Red Hat 3scale. The default behavior is that APIs are not exposed for automatic discovery in 3scale.

If you enable 3scale discovery, you can later optionally disable it.

#### 3.3.1. Configuring Fuse Online to enable 3scale discovery of APIs

If you create an API provider integration, you might want to enable discovery of the API for that integration in Red Hat 3scale. The default behavior is that APIs are not exposed for automatic discovery in 3scale. When you enable discovery, you must provide a URL for a 3scale user interface.

To configure Fuse Online to enable 3scale discovery of APIs before you install Fuse Online, see [Descriptions of custom resource attributes that configure Fuse Online](#).

After installation, you can enable discovery by updating the **syndesis** custom resource. Instructions for doing this are in this topic. When you enable discovery, it applies to only the OpenShift project that you are connected to when you update the resource.

Turning on 3scale service discovery means that:

- The default behavior is that 3scale publishes API provider integrations. When 3scale publishes an API provider integration:
  - Fuse Online does not provide an external URL for an API provider integration that is running.
  - The API is accessible only through 3scale. Configuration in 3scale is required to expose the endpoint. For details, see [Red Hat 3scale API Management, Service Discovery](#).
- The creator of an API provider integration can disable 3scale discovery for that integration. In other words, each API provider integration creator can choose whether that integration's API is discoverable.

#### Prerequisites

- Fuse Online is installed on OCP on-site.
- The **oc** client tool is installed and it is connected to the OCP cluster in which Fuse Online is installed.

- You have permission to install Fuse Online in the project for which you want to enable discovery of APIs.
- You know the name of the 3scale project on the OpenShift cluster.

## Procedure

1. Log in to OpenShift with an account that has permission to install Fuse Online. For example:  
**oc login -u developer -p developer**
2. Switch to an OpenShift project in which Fuse Online is running. You are enabling discovery for only this project. For example:  
**oc project my-fuse-online-project**
3. Add permissions that allow the 3scale project to view Fuse Online integrations:  
**oc adm policy add-cluster-role-to-user view system:serviceaccount:<3scale-project>:amp**

For example, if the 3scale project on OpenShift is named **my3scale**:

**oc adm policy add-cluster-role-to-user view system:serviceaccount:my3scale:amp**

4. Edit the **syndesis** custom resource:
  - a. Invoke the following command, which typically opens the resource in an editor:  
**oc edit syndesis**
  - b. Edit the resource by setting **managementUrlFor3scale** to the URL for your 3scale user interface. The result looks like this:

```
spec:
  components:
    server:
      features:
        managementUrlFor3scale: https://3scale-admin.apps.mycluster.com
```

- c. Save the resource.
5. Optional. To confirm that discovery is turned on for the project that you switched to, invoke the following command:  
**oc describe dc/syndesis-server**

When discovery is turned on, the output from this command shows that the **OPENSIFT\_MANAGEMENT\_URL\_FOR3SCALE** environment variable is set to the URL that you specified in the custom resource.

## Results

This change to the **syndesis** custom resource triggers **syndesis-operator**, which is responsible for installing Fuse Online, to redeploy **syndesis-server**. In the OpenShift project that you switched to, the new default behavior is that APIs are exposed for discovery in 3scale.

Do not edit the **syndesis-server DeploymentConfig** object to set the **OPENSIFT\_MANAGEMENT\_URL\_FOR3SCALE** environment variable. This does not work because **syndesis-operator** reverts your change. The **syndesis-operator** ensures that Fuse Online is deployed only and always according to the **syndesis** custom resource.

### 3.3.2. Configuring Fuse Online to disable 3scale discovery of APIs

If you followed the procedure described in [Configuring Fuse Online to enable 3scale discovery of APIs](#), each API provider integration creator can choose whether that integration's API is discoverable. At some point, you might want to reconfigure the default behavior, which is that integration APIs are not discoverable in 3scale. For example, you might want to edit and test an API provider integration in Fuse Online. To do this, update the Fuse Online **syndesis** custom resource so that the line that specifies the **managementUrlFor3scale** key and value is commented out. This disables discovery by 3scale. Then republish any API provider integrations that were published with discoverable APIs.

#### Prerequisites

- Fuse Online is installed on OCP on-site.
- You have permission to install Fuse Online in the project in which you want to disable discovery.
- The **oc** client tool is installed and it is connected to the OCP cluster in which Fuse Online is installed.
- 3scale discovery was enabled in an OpenShift project as described in [Configuring Fuse Online to enable 3scale discovery of APIs](#).

#### Procedure

1. Log in to OpenShift with an account that has permission to install Fuse Online. For example:  
**oc login -u developer -p developer**
2. Switch to an OpenShift project in which 3scale discovery was enabled. For example:  
**oc project my-fuse-online-project**
3. Edit the **syndesis** custom resource:
  - a. Invoke the following command, which typically opens the resource in an editor:  
**oc edit syndesis**
  - b. Edit the resource by inserting a hash sign (**#**) at the beginning of the line that specifies the **managementUrlFor3scale** key and value. This makes the line a comment, which disables discovery. The result should look like this:

```
spec:
  components:
    server:
      features:
        # managementUrlFor3scale: https://3scale-admin.apps.mycluster.com
```

- c. Save the resource.  
This updates the **syndesis** custom resource. The update removes the **OPENSIFT\_MANAGEMENT\_URL\_FOR3SCALE** environment variable. This change to the **syndesis** custom resource triggers **syndesis-operator**, which is responsible for installing Fuse Online, to redeploy **syndesis-server**. The new default behavior is that APIs are no longer exposed for discovery in 3scale.

Do not edit the **syndesis-server DeploymentConfig** object to remove the setting of the **OPENSIFT\_MANAGEMENT\_URL\_FOR3SCALE** environment variable. This does not work because **syndesis-operator** reverts your change. The **syndesis-operator** ensures that Fuse Online is deployed only and always according to the **syndesis** custom resource.



4. Republish any API provider integration that had discovery enabled and that was created in the project in which you just disabled discovery.  
In other words, you do not need to republish an API provider integration if you disabled discovery of that integration's API while discovery was enabled for the project in which the API provider integration was created.

## Results

APIs for API provider integrations that were created in the relevant OpenShift project are no longer discoverable in 3scale.

When Fuse Online publishes (or republishes) an API provider integration that is in the relevant project, Fuse Online provides an external URL for invoking the API provider integration operations.

## 3.4. CONFIGURING FUSE ONLINE PODS

You can configure the placement of Fuse Online infrastructure component and integration pods onto nodes within an OpenShift cluster by setting node affinity and tolerations options in the Fuse Online custom resource. The **nodeAffinity** option allows you to specify an affinity for Fuse Online pods towards a group of nodes to be placed on. The **tolerations** option allows you to control which nodes the Fuse Online pods run on and to prevent other workloads from using those nodes.

You set these options by editing the Fuse Online custom resource before or after installing Fuse Online.

You specify configure node affinity or tolerations settings for infrastructure component deployments separately from integration deployments:

- **infraScheduling** - Specify the **infraScheduling** option to configure node affinity and tolerations settings for these Fuse Online infrastructure deployments:
  - **syndesis-db**
  - **syndesis-meta**
  - **syndesis-prometheus**
  - **syndesis-ui**  
**Note:** The **syndesis-operator** deployment is not affected by a change in node affinity or tolerations because it is the Fuse Online management component.
- **integrationScheduling** - Specify the **integrationScheduling** option to configure node affinity and tolerations settings for all Fuse Online integration deployments.  
**Note:** If you want to know whether a Fuse Online deployment is an integration deployment, check the deployment name. You can use the **oc get pods** command to view a list of running deployments. If a deployment name includes a **-i** prefix, it is an integration deployment, for example, **i-my-integration**.

The following procedure describes how to edit the custom resource with the **oc patch** command. Alternatively, you can edit the custom resource as described in these topics:

- If you have already installed Fuse Online, open the custom resource by following the steps in ["General procedure for changing Fuse Online configuration"](#).
- If you have not yet installed Fuse Online, open the custom resource by following the steps in these topics, depending on your OCP version:
  - For OCP 4.x: [Adding a Fuse Online instance to an OpenShift 4.x project](#)

- For OCP 3.11: [Editing the default custom resource file before installing Fuse Online](#)

## Prerequisites

- Fuse Online is installed on OCP on-site.
- The **oc** client tool is installed and it is connected to the OCP cluster in which Fuse Online is installed.

## Procedure

1. Use the **oc patch** command with the following syntax to configure **tolerations** settings. Specify **infraScheduling** for Fuse Online infrastructure component deployments or **integrationScheduling** for Fuse Online integration deployments:

```
oc patch syndesis/app --type=merge -p '{"spec":{"infraScheduling":"infraScheduling":{"tolerations":[{"key":"_value1_","operator":"_value2_","effect":"_value3_"}, {"key":"_value4_","operator":"_value5_","effect":"_value6_"}]}}'
```

For example, the following command adds tolerations for Fuse Online infrastructure components:

```
oc patch syndesis/app --type=merge -p '{"spec":{"infraScheduling":{"tolerations":[{"key":"tol_1","operator":"Equal","effect":"NoSchedule"}, {"key":"tol_2","operator":"Equal","value":"value2","effect":"NoSchedule"}]}}'
```

2. Use the **oc patch** command with the following syntax to configure **node affinity** settings. Specify **infraScheduling** for Fuse Online infrastructure component deployments or **integrationScheduling** for Fuse Online integration deployments:

```
oc patch syndesis/app --type=merge -p '{"spec":{"infraScheduling":"infraScheduling":{"affinity":{"nodeAffinity":{"preferredDuringSchedulingIgnoredDuringExecution":[{"weight":_value1_,"preference":{"matchExpressions":[{"key":"_value1_","operator":"_value2_","values":["_value3_","_value4_"]}]}]}}}}}'
```

For example, the following command sets nodeAffinity to both Fuse Online infrastructure components and integrations:

```
oc patch syndesis/app --type=merge -p '{"spec":{"infraScheduling":{"affinity":{"nodeAffinity":{"preferredDuringSchedulingIgnoredDuringExecution":[{"weight":11,"preference":{"matchExpressions":[{"key":"_affinity","operator":"In","values":["foo","bar"]}]}]}}, "integrationScheduling":{"affinity":{"nodeAffinity":{"preferredDuringSchedulingIgnoredDuringExecution":[{"weight":22,"preference":{"matchExpressions":[{"key":"my_affinity2","operator":"In","values":["foo","bar"]}]}]}}}}}'
```

3. To remove a configuration setting, use the **remove** option in the **oc patch** command, as demonstrated in the following example commands:
  - The following example command removes the **preferredDuringSchedulingIgnoredDuringExecution** setting from a nodeAffinity for Fuse Online integrations:

```
oc patch syndesis/app --type=json -p [{"op": "remove", "path":
"/spec/integrationScheduling/affinity/nodeAffinity/preferredDuringSchedulingIgnoredDuringE
xecution" }]
```

- The following example removes the tolerations from Fuse Online infrastructure components:

```
oc patch syndesis/app --type=json -p [{"op": "remove", "path":
"/spec/infraScheduling/tolerations" }]
```

### Additional resources

For information about tolerations and node affinity, see the [Understanding node affinity](#) and the [Controlling pod placement using node taints](#) sections of the OpenShift documentation.

## 3.5. CONFIGURING THE HTTP PROXY

Many services use a HTTP proxy to filter and secure communications with other services or components. To configure the HTTP proxy on Fuse Online components and integrations, edit the Fuse Online custom resource before or after installing Fuse Online.

### Prerequisite

- You know the host and port values for the HTTP proxy.

### Procedure

1. Open the custom resource in an editor:

If you have already installed Fuse Online, open the custom resource by following the steps in [“General procedure for changing Fuse Online configuration”](#).

If you have not yet installed Fuse Online, open the custom resource by following the steps in these topics, depending on your OCP version:

- For OCP 4.x: [Adding a Fuse Online instance to an OpenShift 4.x project](#)
  - For OCP 3.11: [Editing the default custom resource file before installing Fuse Online](#)
2. For the **syndesis-server** and **syndesis-meta** components, set the Java Options (**javaOptions**) parameter and specify values for the HTTP proxy host and port. Use the same HTTP proxy values for both **syndesis-server** and **syndesis-meta**.

For example:

```
spec:
  components:
    server:
      javaOptions:
        -Dhttp.proxyHost=10.0.0.100 -Dhttp.proxyPort=8800
    meta:
      javaOptions:
        -Dhttp.proxyHost=10.0.0.100 -Dhttp.proxyPort=8800
```

- For Fuse Online integrations, set the Maven Arguments (additionalArguments) parameter. For example:

```
spec:
  components:
    server:
      features:
        maven:
          additionalArguments: "-Dhttp.proxy=10.0.0.100 -Dhttp.proxyPort=8800"
```

- Save the custom resource.  
If Fuse Online is already installed, the **syndesis-server** pod is redeployed in response to the javaOptions update in Step 2. (Note that if you make a change to only the Maven **additionalArguments** parameter, you must delete the **syndesis-server** pod in order to trigger a redeployment.)
- Republish any running integrations that use the HTTP proxy.
  - In Fuse Online, select the integration that you want to update.
  - Select **Edit**.
  - Select **Publish**.

Fuse Online uses the HTTP proxy settings when it rebuilds the integration.

## 3.6. ADDING A SAMPLE APP TO A FUSE ONLINE ENVIRONMENT RUNNING ON OCP

To help new users learn how to create integrations with Fuse Online, you can add a sample app to your Fuse Online environment. The **ToDo** app enables users to confirm that the AMQ to REST API sample integration works as expected.

To configure Fuse Online to have the ToDo app before you install Fuse Online, see [Descriptions of custom resource attributes that configure Fuse Online](#).

### Prerequisites

- Fuse Online is installed and running on OCP on-site.
- The **oc** client tool is installed and it is connected to the OCP cluster in which Fuse Online is installed.
- A user with cluster administration permissions gave you permission to install Fuse Online in any project that you have permission to access in the cluster.
- You have a [Red Hat developer](#) account for which you know your user name and password. The installation script prompts you for these credentials so it can authenticate you against <https://developers.redhat.com>. For details about creating an account, see [Accessing and Configuring the Red Hat Registry](#).

### Procedure

- Log in to OpenShift with an account that has permission to install Fuse Online. For example:  
**oc login -u developer -p developer**

2. Switch to the project in which Fuse Online is running. For example:  
**oc project my-fuse-online-project**
3. Edit the **syndesis** custom resource:
  - a. Invoke the following command, which typically opens the resource in an editor:  
**oc edit syndesis**
  - b. Ensure that the following lines are in the resource. Edit as needed.

```
spec:  
  addons:  
    todo:  
      enabled: true
```
  - c. Save the resource.  
Saving this change to the **syndesis** custom resource triggers **syndesis-operator** to create a new **todo** pod.

### Next steps

Use the Todo app by [Implementing the AMQ to REST API sample integration](#) .

## CHAPTER 4. MANAGING FUSE ONLINE ON OCP

After you install Fuse Online on OpenShift Container Platform (OCP) on-site, you can use Prometheus to monitor integration activity, and you can set up periodic Fuse Online backups, which you can use to restore Fuse Online environments. As needed, you can upgrade Fuse Online, uninstall Fuse Online, or delete an OCP project that contains Fuse Online.

See the following topics for details:

- [Section 4.1, “Monitoring Fuse Online integrations and infrastructure components with Prometheus”](#)
- [Section 4.2, “Fuse Online Metering labels”](#)
- [Section 4.3, “Backing up a Fuse Online environment”](#)
- [Section 4.4, “Restoring a Fuse Online environment”](#)
- [Section 4.5, “Upgrading Fuse Online”](#)
- [Section 4.6, “Uninstalling Fuse Online from an OCP project”](#)
- [Section 4.7, “Deleting an OCP project that contains Fuse Online”](#)

### 4.1. MONITORING FUSE ONLINE INTEGRATIONS AND INFRASTRUCTURE COMPONENTS WITH PROMETHEUS

You can use Prometheus to monitor Fuse Online infrastructure components and Fuse Online integrations. You can also use Grafana dashboards to visualize the metrics gathered by Prometheus.



#### IMPORTANT

Red Hat support for Prometheus is limited to the setup and configuration recommendations provided in Red Hat product documentation.

Grafana is a community-supported feature. Deploying Grafana to monitor Red Hat Fuse products is not supported with Red Hat production service level agreements (SLAs).

In addition to monitoring Fuse Online integrations, you can use Prometheus to monitor the metrics exposed by the following Fuse Online infrastructure components:

#### Syndesis Server

The **syndesis-server** component has been instrumented with Micrometer and exposes all of the JVM Micrometer metrics automatically by default. Additionally, **syndesis-server** exposes metrics about the REST API endpoints, such as request rate, error rate, and latency.

#### Syndesis Meta

The **syndesis-meta** component has been instrumented with Micrometer and exposes all of the JVM Micrometer metrics automatically by default. It also exposes metrics about its REST API endpoints.

#### Syndesis DB

Metrics for the Fuse Online Postgres database are exported using [a third-party Prometheus exporter](#).

#### Integrations

The **integration** metrics are visible after an integration has been created and are exported by using the official JMX exporter, which exposes several JVM metrics by default. Additionally, integration metrics expose metrics that are specific to Apache Camel, such as message rate and error rate.

## Prerequisites

- Fuse Online is installed and running on OCP on-site.
- The **oc** client tool is installed and it is connected to the OCP cluster in which Fuse Online is installed.
- You have **admin** access to the Fuse Online namespace.
- You have a [Red Hat developer](https://developers.redhat.com) account for which you know your user name and password. The installation script prompts you for these credentials so it can authenticate you against <https://developers.redhat.com>. For details about creating an account, see [Accessing and Configuring the Red Hat Registry](#).
- A person with **cluster admin** access has deployed Prometheus and Grafana with the Application Monitoring operator (specifically, tag **v1.1.6**) by following [these installation instructions](#).

## Procedure

1. In the Fuse Online namespace, set the **monitoring-key=middleware** label by using the following command:

```
oc label namespace <fuse-online-namespace> monitoring-key=middleware
```

2. Verify that your Fuse Online installation added the application monitoring configuration resources to the OpenShift cluster:
  - a. In the OpenShift web console, go to the **application-monitoring** project and then open the **prometheus-route** URL.
  - b. In the Prometheus console, go to the **Status → Targets** page.  
If a **Syndesis** target is listed, then Fuse Online is configured for monitoring and you can skip to Step 4.  
  
If a **Syndesis** target is not listed, continue to Step 3.
3. To expose Fuse Online for monitoring by a Prometheus instance that is installed in a separate OpenShift project, enable the **ops** add-on in the **syndesis** custom resource:
  - a. Go to the Fuse Online namespace:

OpenShift 4.x	OpenShift 3.11
<ol style="list-style-type: none"> <li>i. In the OpenShift web console, go to the Fuse Online (<b>syndesis</b>) project.</li> <li>ii. Select <b>Catalog &gt; Installed Operators</b> and then click <b>Fuse Online Operator</b>.</li> <li>iii. Click <b>Syndesis CRD</b> and then click <b>app</b>.</li> <li>iv. Click <b>Yaml</b> to open the <b>yaml</b> file in the editor.</li> </ol>	<ol style="list-style-type: none"> <li>i. Select <b>Resources &gt; Other Resources</b>.</li> <li>ii. From the dropdown menu, select the <b>Syndesis</b> resources type.</li> <li>iii. For the <b>app</b> resource, click <b>Actions</b> and then select <b>Edit YAML</b> to open the <b>yaml</b> file in the editor.</li> </ol>

- b. Edit the **yaml** file to set the **Syndesis.Spec.Addons.Ops.Enable** value to **true** by adding the follow lines:

```
spec:
  addons:
    ops:
      enabled: true
```

- c. Save the file.
- d. Wait for the pod to restart.



#### NOTE

Fuse Online infrastructure resources are not available immediately after you run the install commands. You might need to wait before you can see the Fuse Online (Syndesis) targets in the **Prometheus Targets** page.

4. To access Prometheus:
  - a. In the OpenShift console for the project where the application monitoring operator is installed, open the list of routes.
  - b. Next to the **prometheus-route** entry, click the hostname URL to open the Prometheus console.
  - c. To view a list of the alert rules configured for Fuse Online infrastructure components, click the **Alerts** menu item.
5. To access Grafana dashboards:
  - a. In the OpenShift console for the project where the application monitoring operator is installed, open the list of routes.
  - b. Next to the **grafana-route** entry, click the hostname URL to open the Grafana console.
  - c. At the top of the Grafana console, click the dashboard selector.
    - For Fuse Online integrations, select **Integration - Camel**. This dashboard displays the standard metrics exposed by Apache Camel integration applications.



- For Fuse Online infrastructure components, select one of the following infrastructure dashboards:

#### Infrastructure - DB

Displays metrics related to the Fuse Online Postgres instance.

#### Infrastructure - JVM

Displays metrics about the running JVM for the **syndesis-meta** or **syndesis-server** applications. Chose the application that you want to monitor from the **Application** drop down list at the top of the dashboard.

#### Infrastructure - REST APIs

Displays metrics relating to the Fuse Online infrastructure API endpoints, such as **request throughput** and **latency**. Choose the application that you want to monitor from the **Application** drop down list at the top of the dashboard.

6. To access Prometheus Alertmanager:

- In the OpenShift console for the project where the application monitoring operator is installed, open the list of routes.
- Next to the **alertmanager-route** entry, click the hostname URL to open the Alertmanager console.

If the Fuse Online infrastructure is healthy, the default view is empty.

If any of the infrastructure components are unhealthy, any active alerts that have been fired are listed, along with the option to silence them.

### Additional resources

For information about getting started with Prometheus, go to:

[https://prometheus.io/docs/prometheus/latest/getting\\_started/](https://prometheus.io/docs/prometheus/latest/getting_started/)

## 4.2. FUSE ONLINE METERING LABELS

You can use the OpenShift Metering operator to analyze your installed Fuse Online operator and components to determine whether you are in compliance with your Red Hat subscription. For more information on Metering, see the [OpenShift documentation](#).

The following table lists the metering labels for Fuse Online infrastructure components and integrations.

**Table 4.1. Metering Labels for Fuse Online**

Label	Possible values
<b>com.company</b>	<b>Red_Hat</b>
<b>rht.prod_name</b>	<b>Red_Hat_Integration</b>
<b>rht.prod_ver</b>	<b>7.8</b>
<b>rht.comp</b>	<b>Fuse</b>
<b>rht.comp_ver</b>	<b>7.8</b>

Label	Possible values
<b>rht.subcomp</b>	<b>syndesis-db</b> <b>syndesis-server</b> <b>syndesis-meta</b> <b>syndesis-ui</b> <b>syndesis-prometheus</b> <b>syndesis-operator</b> <b>i-&lt;integration name&gt;</b>
<b>rht.subcomp_t</b>	<b>infrastructure</b> (when <b>rht.subcomp = syndesis-*</b> ) <b>application</b> (when <b>rht.subcomp = i-*</b> )

### Examples

- Infrastructure example (where the infrastructure component is **syndesis-db**)

```
com.company: Red_Hat
rht.prod_name: Red_Hat_Integration
rht.prod_ver: 7.8
rht.comp: Fuse
rht.comp_ver: 7.8
rht.subcomp: syndesis-db
rht.subcomp_t: infrastructure
```

- Application example (where the integration deployment name is **mytestapp**)

```
com.company: Red_Hat
rht.prod_name: Red_Hat_Integration
rht.prod_ver: 7.8
rht.comp: Fuse
rht.comp_ver: 7.8
rht.subcomp: i-mytestapp
rht.subcomp_t: application
```

## 4.3. BACKING UP A FUSE ONLINE ENVIRONMENT

You can configure Fuse Online to periodically back up:

- The internal PostgreSQL database in which Fuse Online stores connections and integrations.
- OpenShift resources that **syndesis-operator** creates and that are needed to run Fuse Online. This includes, but is not limited to, configuration maps, deployment configurations, and service accounts.

You can configure backups for a Fuse Online environment before you install Fuse Online or you can change the configuration of a Fuse Online environment to enable backups.

When Fuse Online is configured to perform backups, Fuse Online zips data into one file and uploads that file to an Amazon S3 bucket that you specify. You can apply a backup to a new Fuse Online environment (no connections or integrations defined) to restore the Fuse Online environment that was backed up.

### Prerequisites

- OCP is running on-site.
- The **oc** client tool is installed and connected to the OCP cluster in which Fuse Online is or will be running.
- A user with cluster administration permissions gave you permission to install Fuse Online in any project that you have permission to access in the cluster.
- You have an AWS access key and an AWS secret key. For details about obtaining these credentials, see the AWS documentation for [Managing Access Keys for IAM Users](#).
- You know the AWS region where the S3 bucket that you want to upload to resides.
- You know the name of the S3 bucket that you want to upload backups to.

### Procedure

1. Log in to OpenShift with an account that has permission to install Fuse Online. For example:  
**oc login -u developer -p developer**
2. Switch to the OpenShift project that is or will be running the Fuse Online environment for which you want to configure backups. For example:  
**oc project my-fuse-online-project**
3. Create an OpenShift secret. In the command line:
  - Specify **syndesis-backup-s3** as shown in the following command format.
  - Replace the AWS variables with your AWS access key, AWS secret key, AWS region in which the bucket resides, and the name of the bucket.  
Use the following command format to create the secret:

```
oc create secret generic syndesis-backup-s3 \
  --from-literal=secret-key-id="my-aws-access-key" \
  --from-literal=secret-access-key="my-aws-secret-key" \
  --from-literal=region="aws-region" \
  --from-literal=bucket-name="aws-bucket-name"
```

This secret must be present when the backup job is running.

4. If Fuse Online **is not yet installed**, you must edit the **default-cr.yml** file to enable backups. See [Editing the \*\*syndesis\*\* custom resource before installing Fuse Online](#). After Fuse Online is installed, there will be backup jobs according to the schedule that you specified in the custom resource.  
If Fuse Online **is running**, you must edit the **syndesis** custom resource:

- a. Invoke the following command, which opens the **syndesis** custom resource in an editor:  
**oc edit syndesis**
- b. Add the following under **spec::**

```
backup:
  schedule: my-backup-interval
```

Replace **my-backup-interval** with the desired duration between backups. To determine how to specify the interval between backups, consult the following resources:

- [cron pre-defined schedules](#)
  - [cron intervals](#)
- Do not specify the @ sign in front of the interval. For example, to configure daily backups, the custom resource would contain something like this:

```
apiVersion: syndesis.io/v1beta1
kind: Syndesis
metadata:
  name: app
spec:
  backup:
    schedule: daily
```

5. Save the file.  
This adds a backup job to **syndesis-operator**.

## Result

If Fuse Online was already running, there is now a Fuse Online backup job according to the schedule that you defined.

## Next steps

If Fuse Online needs to be installed, edit the **default-cr.yml** file to enable any other desired features or set any other parameters. When the **default-cr.yml** file has all the settings that you want, install Fuse Online in the project that you specified when you created the OpenShift secret.

## 4.4. RESTORING A FUSE ONLINE ENVIRONMENT

In a new Fuse Online environment, in which you have not yet created any connections or integrations, you can restore a backup of a Fuse Online environment. After you restore a Fuse Online environment, you must edit the restored connections to update their passwords. You should then be able to publish the restored integrations.

### Prerequisites

- OCP is running on-site.
- The **oc** client tool is installed and connected to the OCP cluster in which you want to restore a Fuse Online environment.
- A user with cluster administration permissions gave you permission to install Fuse Online in any project that you have permission to access in the cluster.

- There is a Fuse Online environment that was configured to periodically back up data and upload the data to Amazon S3.
- The Fuse Online release number, for example, 7.6, is the same for the Fuse Online environment that was backed up and the Fuse Online environment in which you want to restore the backup.
- You have permission to access the AWS bucket that contains the Fuse Online backups.
- The Fuse Online environment in which you want to restore a backup is a new Fuse Online installation. In other words, there are no connections or integrations that you defined. If you want to restore Fuse Online in a project that has a Fuse Online environment with connections and integrations, then you must uninstall that Fuse Online environment and install a new Fuse Online environment.

## Procedure

1. Download the desired backup file from Amazon S3. Details for doing this are in the AWS documentation for [How Do I Download an Object from an S3 Bucket?](#)
2. Extract the content of the zip file. For example, the following command unzips the **7.6-2020-03-15-23:30:00.zip** file and copies the content into the **/tmp/fuse-online-backup** folder:  
**unzip 7.6-2020-03-15-23:30:00.zip -d /tmp/fuse-online-backup**
3. Decode the Fuse Online database, for example:

```
base64 -d /tmp/fuse-online-backup/syndesis-db.dump > /tmp/fuse-online-backup/syndesis-db
```

4. Switch to the OpenShift project that is running the new Fuse Online environment. For example, if the new Fuse Online environment is in the **my-fuse-online-project**, then you would invoke the following command:  
**oc project my-fuse-online-project**

The remainder of this procedure assumes that you have switched to the project that contains the new Fuse Online environment.

5. Obtain the name of the database pod.  
If the restored Fuse Online environment uses the provided, internal, PostgreSQL database, invoke the following command to obtain the name of the database pod:

```
oc get pods -l deploymentconfig=syndesis-db -o jsonpath='{.items[*].metadata.name}'
```

If the restored Fuse Online environment uses an external database, it is assumed that you know how to obtain the name of the pod for that database.

In the remaining commands, where you see **DATABASE\_POD\_NAME**, insert the name of the database pod for the restored Fuse Online environment.

6. Scale down the components that are accessing the database in any way.
  - a. Scale down **syndesis-operator** so that other components can be scaled down:  
**oc scale dc syndesis-operator --replicas 0**
  - b. Scale down the **syndesis-server** and **syndesis-meta** components:  
**oc scale dc syndesis-server --replicas 0**  
**oc scale dc syndesis-meta --replicas 0**

- Send the database backup file to the Fuse Online database pod:

```
oc cp /tmp/fuse-online-backup/syndesis-db DATABASE_POD_NAME:/tmp/syndesis-db
```

- Open a remote shell session in the Fuse Online database pod:

```
oc rsh DATABASE_POD_NAME
```

- Invoke the following commands to restore the Fuse Online database.

If a **psql** command prompts for the database password, and the restored Fuse Online environment uses the provided, internal PostgreSQL database, you can find the password in the **POSTGRESQL\_PASSWORD** environment variable in the **syndesis-db** deployment configuration. If the restored Fuse Online environment uses an external database, then it is assumed that you know the password.

```
cd /tmp
psql -c 'DROP database if exists syndesis_restore'
psql -c 'CREATE database syndesis_restore'
pg_restore -v -d syndesis_restore /tmp/syndesis-db
psql -c "SELECT pg_terminate_backend(pid) FROM pg_stat_activity WHERE datname = 'syndesis'"
psql -c 'DROP database if exists syndesis'
psql -c 'ALTER database syndesis_restore rename to syndesis'
```

Fuse Online should now be restored. You can end the RSH session:

```
exit
```

- Scale up the Fuse Online components:

```
oc scale dc syndesis-operator --replicas 1
```

Scaling **syndesis-operator** to **1** should bring up the other pods that were scaled down. However, if that does not happen, you can scale them up manually:

```
oc scale dc syndesis-server --replicas 1
oc scale dc syndesis-meta --replicas 1
```

- The server tries to start each restored integration but you need to update connections first. Consequently, ensure that the restored integrations are not running:

- Obtain the Fuse Online console route:

```
echo "https://$(oc get route/syndesis -o jsonpath='{.spec.host}')
```

- Log in into the Fuse Online console with an OpenShift user account that has permission to install Fuse Online.
- Display the list of integrations and ensure that all integrations are stopped. If an integration is running, stop it.

- For each connection that has a password, you need to update the connection to have the correct password for this Fuse Online environment. The following steps show how to do this for the provided **PostgresDB** connection.

- In the OpenShift console for the project in which this restored Fuse Online environment is running, retrieve the password for the **PostgresDB** connection. In the **syndesis-db** deployment, the password is available in the environment variables.

- b. In the Fuse Online console, display the connections.
  - c. Edit the **PostgresDB** connection.
  - d. In the connection details for the **PostgresDB** connection, paste the retrieved password in the **Password** field.
13. For each integration, confirm that there are no **Configuration Required** indicators. If there are, edit the integration to resolve the issues. When all steps in the integration are correct, publish the integration.
- If Fuse Online keeps rolling an integration back to a **Stopped** state right after the **Build** step, delete the deployment, ensure that no configuration is required, and try publishing the integration again.

You can safely ignore the following message if you see it in the log:

```
Error performing GET request to https://syndesis-my-fuse-online-project.my-cluster-url/api/v1/metrics/integrations
```

## 4.5. UPGRADING FUSE ONLINE

From time to time, fresh application images, which incorporate patches and security fixes, are released for Fuse Online. You are notified of these updates through Red Hat's errata update channel. You can then upgrade your Fuse Online images.

Before you upgrade to Fuse Online 7.8, you should set up access to Docker images for the Fuse Online backup and restore database, as described in [Access Docker images before an upgrade](#).

The procedure for upgrading Fuse Online depends on how you installed Fuse Online:

- If you used the OperatorHub to install Fuse Online, see [Upgrading Fuse Online by using the OperatorHub](#).
- If you used the install script to install Fuse Online, see [Upgrading Fuse Online by using the install script](#).

### 4.5.1. Access Docker images before an upgrade

By default, the Fuse Online upgrade process pulls Docker images for the Fuse Online backup and restore database from the **docker.io** registry, instead of pulling them from **registry.redhat.io** (as described in the known issue <https://issues.redhat.com/browse/ENTESB-15364>). Because **docker.io** imposes a service limitation on free downloads, the Fuse Online upgrade process could encounter the following error when it attempts to download the backup and restore database images:

```
error: code = Unknown desc = toomanyrequests: You have reached your pull rate limit
```

For more information about the Docker Hub pull rate limit, see the Docker documentation (<https://www.docker.com/increase-rate-limits>).

To avoid encountering the Docker limit error, before you start the Fuse Online upgrade process, make sure that you have access to Docker images. How you access the Docker images depends on your OpenShift Container Platform (OCP) version:

- For OCP 4.6, add Docker Hub credentials into your existing syndesis pull secret as described in [Accessing Docker images on OCP 4.6](#). When you add your Docker credentials to the syndesis pull secret, the Docker Hub limit on API is raised, depending on your Docker Hub account type.
- For OCP 3.11, pull the Fuse Online backup and restore database images from **docker.io** to a local cache as described in [Accessing Docker images on OCP 3.11](#).

#### 4.5.1.1. Accessing Docker images on OCP4

To avoid encountering a possible Docker limit error, before you start the Fuse Online upgrade process, add your docker credentials to the syndesis pull secret.

#### Prerequisite

You have OpenShift cluster administrator access.

#### Procedure

To add Docker Hub credentials into your existing syndesis pull secret:

1. Log into OpenShift with your administrator credentials:

```
oc login -u system:admin
```

2. Retrieve your syndesis pull secret by running the following command:

```
oc get secrets syndesis-pull-secret -o=custom-columns=SECRET:.data.* --no-headers |
base64 -d | jq
```

This command returns output similar to the following, where <AUTH> is your encoded username and password in base64:

```
{
  "auths":{
    "registry.redhat.io":{
      "username":"<AUTH>",
      "password":"<AUTH>",
      "auth":"<AUTH>"
    },
    <You can have more auths elements here>
  }
}
```

3. To add your Docker Hub registry credentials, edit your pull secret and save it to the PULL\_SECRET variable:

```
PULL_SECRET=$(base64 -w 0 <<EOF
{
  "auths":{
    "registry.redhat.io":{
      "username":"<AUTH>",
      "password":"<AUTH>",
      "auth":"<AUTH>"
    },
    <You can have more auths elements here>
  },
}
```



```

    "https://index.docker.io/v1/": {
      "auth": "<AUTH>"
    }
  }
}
EOF
)

```

4. To patch your syndesis pull secret, run the following command:

```

oc apply -f - <<EOF
apiVersion: v1
kind: Secret
metadata:
  name: syndesis-pull-secret
data:
  .dockerconfigjson: $PULL_SECRET
type: kubernetes.io/dockerconfigjson
EOF

```

### Next step

- If you used the OperatorHub to install Fuse Online, see [Upgrading Fuse Online by using the OperatorHub](#).
- If you used the install script to install Fuse Online, see [Upgrading Fuse Online by using the install script](#).

#### 4.5.1.2. Accessing Docker images on OCP 3.11

To avoid encountering a possible Docker limit error, before you start the Fuse Online upgrade process on OCP 3.11, you should pull the required images from **docker.io** to a local cache.

### Prerequisite

You have OpenShift cluster administrator access.

### Procedure

1. Login to the OpenShift node with your OpenShift username and the OpenShift cluster URL:

```
ssh login <user>@node1.<clusterUrl>
```

2. Login to docker with your username and password:

```
sudo docker login -u <username> -p <password> docker.io
```

3. Run the following commands that pull the PostgreSQL images:

```

sudo docker pull crunchydata/crunchy-pgdump:centos7-10.11-4.2.1
sudo docker pull crunchydata/crunchy-pgrestore:centos7-10.11-4.2.1
sudo docker pull centos:7

```

The PostgreSQL images are pulled to the OpenShift node's internal docker registry.

4. Repeat the previous three steps for each OpenShift node.

### Next step

Upgrade Fuse Online by following the steps in [Upgrading Fuse Online by using the install script](#) .

## 4.5.2. Upgrading Fuse Online by using the OperatorHub

Fuse Online 7.8 is available in the OperatorHub starting with OCP 4.6. If you are using OCP 4.5, you must upgrade to OCP 4.6 if you want to install Fuse Online 7.8.

**Note:** If you used the install script to install Fuse Online 7.7, you should use the install script to upgrade to Fuse Online 7.8 as described in [Upgrading Fuse Online by using the install script](#) .

When you install Fuse Online, you specify a channel with the **fuse-online-v7.n** format, where **n** is the current release number. For example, for Fuse Online 7.8, the channel is **fuse-online-v7.8**.

Upgrading from a Fuse Online 7.8 version to a newer Fuse Online 7.8 version depends on the **Approval Strategy** that you selected when you installed Fuse Online:

- For **Automatic** updates, when a new version of the Fuse Online operator is available, the OpenShift Operator Lifecycle Manager (OLM) automatically upgrades the running instance of the Fuse Online without human intervention.
- For **Manual** updates, when a newer version of an Operator is available, the OLM creates an update request. As a cluster administrator, you must then manually approve that update request to have the Fuse Online operator updated to the new version as described in the [Manually approving a pending Operator upgrade](#) section of the OpenShift documentation.

During and after an infrastructure upgrade, existing integrations continue to run with the *older* versions of Fuse Online libraries and dependencies. To have them run with the updated versions, you must republish them.

For OCP 4.6 and later, to upgrade from Fuse Online 7.7 to 7.8, use the steps in the following procedure.

### Procedure

1. To avoid encountering Docker limit errors, before you start the Fuse Online upgrade process, add your docker credentials to the syndesis pull secret as described in [Access Docker images before an upgrade](#).
2. To upgrade the Fuse Online operator:
  - a. In the OpenShift web console, click **Operators > Installed Operators**.
  - b. Click the **Fuse Online** operator and then **Subscription**.
  - c. Next to the **Channel**, click the **Edit** icon.
  - d. Select the **fuse-online-v7.8** channel and then click **Save**.

If you specified **Manual** updates when you installed Fuse Online, approve the Operator update request by following the instructions in the [Manually approving a pending Operator upgrade](#) section of the OpenShift documentation.

## 4.5.3. Upgrading Fuse Online by using the install script

If you installed Fuse Online by using the install script (rather than the OperatorHub), here are the general steps to upgrade Fuse Online:

- A cluster administrator sets up access to Docker images for the the Fuse Online backup and restore database:
  - For OCP 3.11, pull the Fuse Online backup and restore database images from docker.io to a local cache.
  - For OCP 4.6, add Docker Hub credentials into the existing syndesis pull secret.
- Download the latest Fuse Online release.
- Obtain permission to upgrade Fuse Online from a cluster administrator.
- Run the update script.

The upgrade procedure for the following upgrades is the same:

- From Fuse Online 7.7 to Fuse Online 7.8
- From a Fuse Online 7.8 version to a newer Fuse Online 7.8 version

### Prerequisites

- You installed and are running version 7.7 of Fuse Online on OCP on-site. **OR**, you installed and are running a version of 7.8 of Fuse Online on OCP 3.11 and you want to upgrade to fresh application images.  
For earlier versions:
  - If you are running version 7.6 of Fuse Online on OCP, then you must [upgrade to 7.7](#) and then you can upgrade to 7.8.
  - If you are running version 7.5 of Fuse Online on OCP, then you must [upgrade to 7.6](#) and then you can upgrade to 7.7.
  - If you are running version 7.4 of Fuse Online on OCP, then you must [upgrade to 7.5](#) and then you can upgrade to 7.6.
  - If you are running version 7.3 of Fuse Online on OCP, then you must [upgrade to 7.4](#) and then you can upgrade to 7.5.
  - If you are running version 7.2 of Fuse Online on OCP, then you must [upgrade to 7.3](#).
  - If you are running version 7.1 of Fuse Online on OCP, then you must [upgrade to 7.2](#).
- You installed the **oc** client tool and it is connected to the OCP cluster in which Fuse Online is installed.
- You have cluster administration permissions, which are required for the first two steps in this procedure.

### Procedure

1. To avoid encountering a possible Docker limit error, a cluster administrator sets up access to Docker images as described in [Access Docker images before an upgrade](#) .

2. A cluster administrator downloads the Fuse Online package and grants permission for a user to upgrade Fuse Online in a particular project:
  - a. Download the package containing the Fuse Online installation scripts from the following location:  
<https://github.com/syndesisio/fuse-online-install/releases/tag/1.11>  
  
Unpack the downloaded archive at a convenient location on your file system. The **fuse-online-install-1.11** directory contains the scripts and supporting files for upgrading Fuse Online.
  - b. Change to the directory that contains the extracted archive. For example:  
**cd fuse-online-install-1.11**
  - c. Log in to OpenShift with a cluster administration account, for example:  
**oc login -u admin -p admin**
  - d. Change to the OpenShift project in which Fuse Online needs to be upgraded, for example:  
**oc project fuse-online-project**
  - e. Update the Fuse Online custom resource definition:  
**bash install\_ocp.sh --setup**
  - f. Grant permission for upgrading Fuse Online in just this project. For example, the following command grants permission for upgrading Fuse Online to the **developer** user. After the cluster administrator runs this command, the **developer** user can upgrade Fuse Online in only this project, which is **fuse-online-project**, in this example:  
**bash install\_ocp.sh --grant developer**
3. The user who was granted permission to upgrade Fuse Online performs the upgrade:
  - a. Log in to OpenShift, for example:  
**oc login -u developer**
  - b. Switch to the project in which you want to upgrade Fuse Online, for example:  
**oc project fuse-online-project**
  - c. To check which version you are about to upgrade to, run the update script with the **--version** option, as follows:  
**bash update\_ocp.sh --version**
  - d. Invoke the update script as follows:  
**bash update\_ocp.sh**  
  
To learn more about the script, invoke **bash update\_ocp.sh --help**.  
  
During and after an infrastructure upgrade, existing integrations continue to run with the *older* versions of Fuse Online libraries and dependencies.
4. Upgrade Fuse Online integrations that are running as follows:
  - a. In Fuse Online, select the integration that you want to upgrade.
  - b. Select **Edit**.
  - c. Select **Publish** to republish the integration.

Republishing the integration forces a rebuild that uses the latest Fuse Online dependencies.

## 4.6. UNINSTALLING FUSE ONLINE FROM AN OCP PROJECT

You can uninstall Fuse Online from an OCP project without deleting the project nor anything else in that project. After uninstalling Fuse Online, integrations that are running continue to run but you can no longer edit or republish them.

### Prerequisite

- You have an OCP project in which Fuse Online is installed.
- You exported any integrations that you might want to use in some other OpenShift project in which Fuse Online is installed. If necessary, see [Export integrations](#).

### Procedure

1. Log in to OpenShift with an account that has permission to install Fuse Online. For example:  
**oc login -u developer -p developer**
2. Switch to the OpenShift project that is running the Fuse Online environment that you want to uninstall. For example:  
**oc project my-fuse-online-project**
3. Delete Fuse Online infrastructure:  
**oc delete syndesis app**
4. Delete **syndesis-operator DeploymentConfig** and **ImageStream** resources:  
**oc delete dc/syndesis-operator**  
**oc delete is/syndesis-operator**

## 4.7. DELETING AN OCP PROJECT THAT CONTAINS FUSE ONLINE

Deleting an OpenShift project in which Fuse Online is installed deletes everything in the project. This includes all integrations that have been defined as well as all integrations that are running.

### Prerequisites

- You have an OCP project in which Fuse Online is installed.
- You exported any integrations that you might want to use in some other OpenShift project in which Fuse Online is installed. If necessary, see [Exporting integrations](#).

### Procedure

Invoke the **oc delete project** command. For example, to delete an OpenShift project whose name is **fuse-online-project**, enter the following command:

```
oc delete project fuse-online-project
```

## CHAPTER 5. HOW TO INVOKE FUSE ONLINE PUBLIC REST API ENDPOINTS

When you are running Fuse Online on OCP, each Fuse Online environment can expose public REST API endpoints. External Continuous Integration/Continuous Delivery (CI/CD) tools can invoke these endpoints to operate on the resources that are in that Fuse Online environment.

In each Fuse Online environment, an OpenShift administrator must expose Fuse Online public REST API endpoints before external tools can invoke those endpoints. The command that invokes an API endpoint specifies the URL for the Fuse Online environment on which the endpoint operates, a secret token, and an authorization token.

See the following topics for details:

- [Section 5.1, “Exposing Fuse Online public REST APIs for use by external tools”](#)
- [Section 5.2, “Description of base URL for Fuse Online public REST API endpoints”](#)
- [Section 5.3, “Obtaining a secret token for calling a public REST API endpoint”](#)
- [Section 5.4, “How to find integration IDs”](#)
- [Section 5.5, “Format for specifying `curl` commands to invoke Fuse Online public endpoints”](#)

### 5.1. EXPOSING FUSE ONLINE PUBLIC REST APIS FOR USE BY EXTERNAL TOOLS

When you are running Fuse Online on OCP on-site, you might want to use an external tool to copy Fuse Online integrations from one Fuse Online environment to another Fuse Online environment. An external CI/CD tool might be a Jenkins job, an Ansible playbook, a **cron**-based shell script, or something else. For example, an Ansible playbook can export an integration from a Fuse Online development environment and import it into a Fuse Online testing environment.

To enable this, you must expose Fuse Online public REST API endpoints for each Fuse Online environment. In other words, you must repeat the procedure here in each OpenShift project in which Fuse Online is installed.

#### Prerequisites

- You have an OCP project in which Fuse Online is installed.
- The **oc** client tool is installed and it is connected to the OCP cluster in which Fuse Online is installed.
- You use an external CI/CD tool and you want it to copy marked integrations from one Fuse Online environment to another.
- Cluster administration privileges are required to execute the **syndesis-operator grant** command. A user who has administrative privileges for the OpenShift project, but not cluster administration privileges, can execute the other commands.

#### Procedure

1. Log in to OpenShift with an account that has cluster administration privileges. For example:  
**oc login -u admin -p admin**

While cluster administration privileges are required for only the **syndesis-operator grant** command, this procedure assumes that a cluster administrator is performing all steps.

2. Switch to an OpenShift project in which Fuse Online is running. You are exposing the public API in only this project. For example:

```
oc project fuse-online-north
```

3. Grant roles to the **syndesis-public-oauthproxy** service account. Your OpenShift project uses this service account to run an OAuth proxy service. Specify a user account that has cluster administration privileges. For example:

```
syndesis-operator grant --user developer
```

This command creates and assigns a cluster role and cluster role binding to the **syndesis-public-oauthproxy** service account. The **ClusterRoleBinding** specifies the name of the OpenShift project in which you are exposing the API, which is **fuse-online-north** in this example:

- **ClusterRole:** **syndesis-auth-delegator**
- **ClusterRoleBinding:** **syndesis-fuse-online-north-auth-delegator**

4. Create a client service account and grant it permission to access the Fuse Online public API:

- a. Create an OpenShift service account with a name that you choose. For example, the following command creates the **cicd-client** service account:

```
oc create serviceaccount cicd-client
```

Commands that invoke public API endpoints use this account to access the public API. Also, you will need this service account to obtain a secret token, which must be specified in calls to API endpoints. This is described in [Obtaining a secret token for calling a REST API endpoint](#).

- b. Grant the client service account permission to access the Fuse Online public API. If **fuse-online-north** is the name of the OpenShift project in which Fuse Online is installed, and if **cicd-client** is the name of the service account that you created for accessing the API service, then you would invoke the following command:

```
oc policy add-role-to-user edit system:serviceaccount:fuse-online-north:cicd-client`
```

5. Edit the **syndesis** custom resource:

- a. Invoke the following command, which typically opens the resource in an editor:

```
oc edit syndesis
```

- b. Edit the resource so that it enables the public API and specifies the Fuse Online environment's public address for invoking endpoints as the setting of **routeHostname**. (If edits to the **default-cr.yml** file, which was used to install Fuse Online, enabled the public API and specified the route hostname for endpoints, you will not need to edit the resource.) Your cluster setup determines the public address that you need to specify. For details, see [the OpenShift documentation for routes](#). In the following example, the route host name is valid for a minishift cluster.

```
spec:
  addons:
    publicApi:
      enabled: true
      routeHostname: public-syndesis.192.168.64.63.nip.io
```

- c. Save (or close) the resource.

Saving the **syndesis** custom resource triggers **syndesis-operator**, which is responsible for installing Fuse Online, to deploy the public API OAuth proxy service.

If you did not need to edit the **syndesis** custom resource, then the public API OAuth proxy service has already been deployed. This is probably because **publicApi** was enabled and its route specified in the **default-cr.yml** file that was used to install Fuse Online.

## Result

In OpenShift, you can now see:

- A pod for the **syndesis-public-oauthproxy** deployment configuration.
- A **syndesis-public-oauthproxy** service.
- A **syndesis-public-api** route.

In the OpenShift project in which you performed this procedure, external CI/CD tools can use Fuse Online public REST API endpoints to export or import Fuse Online integrations.

## Next steps

- Mark integrations for export to other Fuse Online environments. You can [mark an integration in the Fuse Online console](#) or [invoke the Fuse Online public REST API endpoint that marks an integration](#).
- To confirm that public API endpoints are available, invoke a **curl** command that returns environment names. See [Endpoint for obtaining a list of environment labels](#).
- Configure external tools to call the Fuse Online public REST API endpoints.

## 5.2. DESCRIPTION OF BASE URL FOR FUSE ONLINE PUBLIC REST API ENDPOINTS

The base URL for Fuse Online public REST API endpoints is something like this:

**https://public-syndesis.192.168.64.42.nip.io/api/v1/public**

The first part of the base URL is different for each Fuse Online environment. When you create the OpenShift application that runs the Fuse Online public OAuth proxy that enables access to public REST API endpoints, you specify the public address of your Fuse Online environment. This address is the first part of the base URL for calling endpoints that operate in that Fuse Online environment. For example:

**https://public-syndesis.192.168.64.42.nip.io**

The second part of the base URL is the same for all Fuse Online environments:

**/api/v1/public**

The Fuse Online public REST API provides endpoints that operate on three resources:

- **/integrations** are the integrations that are in the Fuse Online environment that is identified in the base URL.





```
EBfXhSAP4Uumi5qAg3_QUTMDstq233NSwBKYtFOw3Pp1ys3p3y0hcaiLMimeCH60vR4iWvptqqzc5Q
DigHiPySZNWxs_5awZlwdolDvR-nSj690aC-
49UKFgyEEzdzFU4bl2W4hOyDyhN9fValAZQKeJUrbJBU-
lnFTHI_NAd2OwzOEBpWZuj31Za5w9fU4kf4UDGA'
```

## Next step

Copy the token from your saved file into a command that calls a public REST API endpoint in the given Fuse Online environment.

## 5.4. HOW TO FIND INTEGRATION IDS

In a command that invokes a Fuse Online public REST API endpoint that operates on only a particular integration, you must specify the ID of the integration that you want the endpoint to operate on. Specify one of the following:

- The integration's name  
You must specify it exactly as it appears in the Fuse Online console, for example, **timer-to-log**. If the integration name has any spaces or special characters, then you must specify HTML escape characters.
- The internal integration ID  
This ID is in the Fuse Online console URL when you view an integration's summary. To view an integration's summary, in the left navigation panel, click **Integrations**. In the list of integrations, click the entry for the integration whose ID you need.

With the integration summary visible in the browser, you would see something like this at the end of the URL: **/integrations/i-Lauq5ShznJ4LcuWwiwcz**. This integration's ID is **i-Lauq5ShznJ4LcuWwiwcz**.

## 5.5. FORMAT FOR SPECIFYING `curl` COMMANDS TO INVOKE FUSE ONLINE PUBLIC ENDPOINTS

A **curl** command that calls a Fuse Online public REST API endpoint has the following format:

```
curl [options] \
  -H "Content-Type: <media-type>" \
  -H "SYNDESIS-XSRF-TOKEN: awesome" \
  -H `Authorization: Bearer <token>` \
  <base-url><endpoint> \
  [--request <HTTP-method>] \
  [-d <data>] \
  [-o <filename>]
```

Table 5.1. `curl` command options

Option	Description
<b>[options]</b>	Specify <b>curl</b> options that you choose.
<b>&lt;media-type&gt;</b>	For the export and import endpoints, specify <b>multipart/form-data</b> . For all other endpoints, specify <b>application/json</b> .



## CHAPTER 6. USING EXTERNAL TOOLS TO EXPORT/IMPORT FUSE ONLINE INTEGRATIONS FOR CI/CD

When you are running Fuse Online on OCP on-site, you might have Continuous Integration/Continuous Deployment (CI/CD) pipelines that you want to act on certain integrations. Implementing this requires the completion of these tasks:

- In the Fuse Online console, mark integrations for CI/CD pipelines.
- In OpenShift, [expose the Fuse Online public API](#).
- Use external tools to invoke Fuse Online public API endpoints that export and import integrations.

See the following topics for details:

- [Section 6.1, "About marking integrations for CI/CD"](#)
- [Section 6.2, "Marking an integration for CI/CD"](#)
- [Section 6.3, "Managing environment labels for CI/CD"](#)
- [Section 6.4, "Invoking the Fuse Online public API export endpoint"](#)
- [Section 6.5, "Invoking the Fuse Online public API import endpoint"](#)

### 6.1. ABOUT MARKING INTEGRATIONS FOR CI/CD

When you are running Fuse Online on OCP on-site, to identify an integration for pipelines, mark the integration for a CI/CD environment that you specify. This applies a time-stamped label to the integration. Backend CI/CD Fuse Online public APIs use the label and its timestamp to filter integrations to find an integration that a pipeline needs to act on.

For example, suppose that in Fuse Online you mark an integration for the **test1** environment. You can then invoke the Fuse Online public API export endpoint to export integrations that have the **test1** environment label. The endpoint packages **test1** integrations into an export file and returns that file. To copy **test1** integrations to a Fuse Online test environment, you would invoke the public API import endpoint and provide the file that contains the exported **test1** integrations.

Now suppose that you iteratively update and publish an integration that you previously marked for the **test1** environment. You now have a new version of the integration and you want to export the updated version to the **test1** environment. You must mark the integration again, even though it is already marked for the **test1** environment. Marking the integration again updates the timestamp on the **test1** environment label. This indicates to external tools that the integration has been updated and it is ready to be exported.

To mark an integration again, that is, to refresh the timestamp on an environment label that is already assigned to an integration, start the procedure for [Marking integrations for CI/CD](#). In the CI/CD dialog, click **Save** since the checkbox for the desired environment should already be selected.


### 6.2. MARKING AN INTEGRATION FOR CI/CD

When you are running Fuse Online on OCP on-site, to identify an integration for pipelines, mark the integration for a CI/CD environment that you specify. This applies a label to the integration.

## Prerequisite

You have an OCP project in which Fuse Online is installed.

## Procedure

1. In the Fuse Online navigation panel on the left, click **Integrations**.
2. In the list of integrations, at the right of the entry for the integration that you want to mark, click  to display a popup menu and click **Manage CI/CD**.
3. In the dialog that appears, do one or more of the following:
  - If the environment for which you want to mark this integration already appears, select the checkbox to the left of that environment.
  - If the environment for which you want to mark this integration is already selected, leave it selected.
  - If you need to create a label for an environment, then click **Manage CI/CD**, which displays a dialog for creating new environment labels. Create the label that you need, and then return to this procedure to mark the integration.

Fuse Online applies selected environment label(s) to the integration. You can apply any number of environment labels to an integration.

4. Click **Save**.

## Result

Fuse Online labels the integration for release in the selected environment. Backend APIs can filter integrations to find the integrations that have, for example, the **test1** label.

## Next step

You must expose the Fuse Online public API endpoints before pipelines can act on integrations that are marked for a particular environment. See [Exposing Fuse Online public REST APIs for use by external tools](#).

## 6.3. MANAGING ENVIRONMENT LABELS FOR CI/CD

In the Fuse Online console, you can create, change, or remove CI/CD environment labels. CI/CD environment labels are tags that you can apply to integrations to identify them for CI/CD pipelines.

### Prerequisites

- Fuse Online is running on OCP on-site.
- External tools use Fuse Online environment labels to identify integrations for CI/CD pipelines.

### Procedure

1. In Fuse Online, in the left navigation panel, click **Integrations**.
2. In the upper right, click **Manage CI/CD**.

### 3. On the **Manage CI/CD** page:

- To create a CI/CD environment label:
  - a. Click **Add New**.
  - b. In the **Add Tag Name** dialog, in the **Tag Name** input field, enter a name for a new environment label, for example, **test1**.
  - c. Click **Save**. On the **Manage CI/CD** page, there is a new entry for the environment label that you just added.
- To change a CI/CD environment label:
  - a. In the list of CI/CD environment labels, in the entry for the label that you want to change, click **Edit**.
  - b. In the **Edit Tag** dialog, change the name as needed.
  - c. Click **Save** to see the updated name in the list of environment labels. Fuse Online applies the updated name to every integration that is already marked with the environment label that you changed.
- To delete a CI/CD environment label:
  - a. In the list of CI/CD environment labels, in the entry for the label that you want to delete, click **Remove**.
  - b. In the confirmation dialog, click **Yes**. Fuse Online deletes the environment label and also removes the deleted environment label from any integrations that have been marked with it.

### Next step

Mark integrations with new environment labels. See [Marking an integration for CI/CD](#).

## 6.4. INVOKING THE FUSE ONLINE PUBLIC API EXPORT ENDPOINT

Before you can use external tools to copy Fuse Online integrations from one Fuse Online environment to another, the following tasks must be completed:

- In Fuse Online, an integration that you want to export for a CI/CD pipeline must be marked for a particular environment. See [Marking an integration for CI/CD](#).  
There is an exception to this requirement. When you want to export all integrations from a Fuse Online environment in one export operation, it does not matter whether or not an integration has already been marked for a particular environment.
- You exposed the Fuse Online public API. See [Exposing Fuse Online public API endpoints for external tools](#).

### Endpoint for exporting integrations for a particular environment

To export integrations that have been marked for a particular environment, Fuse Online provides the following **GET** method endpoint:

**/public/integrations/{env}/export.zip**

Replace **{env}** with a CI/CD environment label that you already created. When an integration is marked

for a particular environment, Fuse Online maintains a timestamp that indicates when it was marked. The default behavior is that the endpoint exports an integration only if it has not already been exported since it was marked. For example, to export integrations that have been marked for the **test1** environment, the endpoint is:

**`/public/integrations/test1/export.zip`**

This endpoint exports each integration that has the **test1** environment label and that meets one of the following conditions:

- The integration was marked for the **test1** environment since the last time that it was exported.
- The integration was marked for the **test1** environment and it has never been exported.

The endpoint packages the integrations in the **export.zip** file and returns that file.

If no integration that is marked for the specified environment has been marked since the last time that the integration was exported, then the endpoint returns an HTTP **204** response to indicate that there is nothing to return.

### Endpoint for exporting all integrations tagged for the specified environment

You can invoke the export endpoint so that it exports all integrations in a Fuse Online environment that are tagged with an environment label that you specify. The endpoint exports the integration whether or not it was marked for the specified environment since the last time the integration was exported. This makes it easy to duplicate all integrations that have a particular tag in another Fuse Online environment. To do this:

- You must have already created the environment label. See [Marking an integration for CI/CD](#).
- Add the **ignoreTimestamp=true** option to the invocation of the export endpoint.

For example:

**`/public/integrations/test1/export.zip?ignoreTimestamp=true -o export.zip`**

### Endpoint for exporting all integrations

You can invoke the export endpoint so that it exports all integrations in one Fuse Online environment. This makes it easy to duplicate all integrations in another Fuse Online environment. To do this:

- You must have already created the environment label. See [Marking an integration for CI/CD](#).
- Add the **all=true** option to the invocation of the export endpoint.

For example:

**`/public/integrations/{env}/export.zip?all=true`**

Replace **{env}** with a CI/CD environment label. The endpoint assigns the specified environment label to each integration that is not already marked for that environment.

When you add the **all=true** option, you must also explicitly specify that you want the exported integrations to be packaged in the **export.zip** file. For example:

**`/public/integrations/test1/export.zip?all=true -o export.zip`**

This invocation of the endpoint:

- Marks each integration for the **test1** environment.
- Returns all integrations in the **export.zip** file.  
If you do not specify the **-o export.zip** option, then the endpoint returns a file whose name is **export.zip?all=true**.

### Custom headers required by export endpoint

A command that invokes the export endpoint must specify these custom headers exactly as follows:

- **-H "Content-Type: multipart/form-data"**
- **-H "SYNDESIS-XSRF-TOKEN: awesome"**  
The Fuse Online public API requires this header to authenticate the request.
- **-H 'Authorization: Bearer <token>'**  
Replace **<token>** with the secret token that you copied into a file when you created the OpenShift service account that is used to expose the Fuse Online public API.

### Sample curl command that exports integrations

Following is an example of a **curl** command that invokes a Fuse Online API endpoint that exports integrations:

```
curl -v -k -L -H "Content-Type: multipart/form-data" -H "SYNDESIS-XSRF-TOKEN: awesome" -H
'Authorization: Bearer
eyJhbGciOiJSUzI1NiIsImtpZCI6Ij9.eyJpc3MiOiJrdWJlcm5ldGVzL3NlcnZpY2VhY2NvdW50Iiwia3ViZXJ
uZXRIcy5pby9zZXJ2aWNIYWVudC9uYW1lc3BhY2UiOiJzeW5kZXNpcylsImt1YmVybWV0ZXMuYV
8vc2VydmljZWJ291bnQvc2VjcmV0Lm5hbWUiOiJzeW5kZXNpcy1jZC1jbGllbnQtdG9rZW4tMnZjNmwi
LCJrdWJlcm5ldGVzLmVlL3NlcnZpY2VhY2NvdW50L3NlcnZpY2UtYWVudC9uYW1lc3BhY2VudC5uYW1lIjoic3luZGVzaX
MtY2QtY2xpZW50Iiwia3ViZXJ2aWNIYWVudC9uYW1lc3BhY2UiOiJzeW5kZXNpcy1jZC1jbGllbnQtdG9rZW4tMnZjNmwi
kljoiNjUxMjYxNGMtMmYwMS0xMWU5LTk3OWEtNDI1YWNIMzY3MTcyliwic3Viljoic3lzdGVtOnNlcnZpY
2VhY2NvdW50OnN5bmRlc2l2OnN5bmRlc2l2LWNkLWNsaWVudCJ9.uKsri0JSKJDbgHoQwAhBJSNuV
KwJggeg2QlrCkxVssSK1zIMZQaF9P5a4R7ZcWRnrZ_345UTqxYVeRfHWVH0PqBkD-
n7PAS9dcKJIFdS1jUHOmL1FTGgc3YW-bz1SIWT93tvK1EhorZ4_-
EBfXhSAP4Uumi5qAg3_QUTMDstq233NSwBKYtFOw3Pp1ys3p3y0hcaiLMimeCH60vR4iWvptqqzc5Q
DigHiPySZNWxs_5awZlwdolDvR-nSj690aC-
49UKFgyEEzdFU4bl2W4hOyDyhN9fValAZQKeJUUrJBU-
lnFTHI_NAd2OwzOEBpWZuj31Za5w9fU4kf4UDGA'
https://public-syndesis.192.168.64.42.nip.io/api/v1/public/integrations/dev1/export.zip
```

In the command:

- The URL at the end of the command identifies the Fuse Online environment from which to export integrations.
- Specification of the **dev1** environment label indicates that you want to export integrations that have been marked for the **dev1** environment and that have not already been exported since they were marked.

## 6.5. INVOKING THE FUSE ONLINE PUBLIC API IMPORT ENDPOINT

You can obtain one or more integrations by invoking a Fuse Online public API export endpoint. To copy exported integrations to another Fuse Online environment, invoke the Fuse Online public API import endpoint.





- Specification of **environment=testing** causes the endpoint to mark each imported integration for the **testing** environment.
- This command produces **multipart/form-data**.

## CHAPTER 7. FUSE ONLINE PUBLIC REST API ENDPOINTS REFERENCE

This section provides reference information for each Fuse Online public REST API endpoint. For additional information, see [How to invoke Fuse Online public REST API endpoints](#) .

The OpenAPI document that defines the public REST API endpoints is available in your Fuse Online environment at <https://<fuse-online-host>/api/v1/openapi.json>. However, this document defines the **tags** object as having three tags: **public-api**, **extensions**, and **integration-support**. Only the **public-api** tag is accessible when using the OpenShift public OAuth proxy process for Fuse Online. You should ignore the other two tags.

- [Section 7.1, “Endpoint for obtaining the state of an integration”](#)
- [Section 7.2, “Endpoint for obtaining a list of an integration’s environment labels”](#)
- [Section 7.3, “Endpoint for marking an integration and keeping unspecified tags”](#)
- [Section 7.4, “Endpoint for marking an integration and removing unspecified tags”](#)
- [Section 7.5, “Endpoint for publishing an integration”](#)
- [Section 7.6, “Endpoint for stopping an integration”](#)
- [Section 7.7, “Endpoint for exporting integrations”](#)
- [Section 7.8, “Endpoint for importing integrations”](#)
- [Section 7.9, “Endpoint for removing an environment label from a particular integration”](#)
- [Section 7.10, “Endpoint for creating an environment label”](#)
- [Section 7.11, “Endpoint for obtaining a list of environment labels”](#)
- [Section 7.12, “Endpoint for changing an environment label”](#)
- [Section 7.13, “Endpoint for removing an environment label from all integrations”](#)
- [Section 7.14, “Endpoint for changing a connection’s properties”](#)

### 7.1. ENDPOINT FOR OBTAINING THE STATE OF AN INTEGRATION

This endpoint returns the state of the specified integration. The state is **Running**, **Stopped**, **Pending**, or **Error**.

#### Method and endpoint

**GET**

**/public/integrations/{id}/state**

Table 7.1. Parameters

Name	Type	Description
Required Header Parameters		
<b>-H "Content-Type: &lt;media-type&gt;"</b>	<b>application/json</b>	Media type that the endpoint requires.
<b>-H "SYNDESIS-XSRF-TOKEN: awesome"</b>	Custom	Required for authentication.
<b>-H 'Authorization: Bearer &lt;token&gt; '</b>	Custom	Secret token for the OpenShift service account that exposes the Fuse Online public REST API. See <a href="#">Obtaining a secret token</a> .
Path Parameter		
<b>{id}</b>	string	Required path parameter. Name or internal ID of the integration whose state you want to obtain. See <a href="#">How to find integration IDs</a> .

### Request example

In the following example, the endpoint returns the state of the **timer-to-log** integration:

```
/public/integrations/timer-to-log/state
```

### Produces

```
application/json
```

### Response example

```
{ "currentState": "Unpublished", "stateDetails": { "id": "i-Lc0JLrsUFtBJfR_ylfEz:5", "integrationId": "i-Lc0JLrsUFtBJfR_ylfEz", "deploymentVersion": 5, "detailedState": { "value": "BUILDING", "currentStep": 2, "totalSteps": 4, "namespace": "syndesis", "podName": "i-timer-to-log-5-build", "linkType": "LOGS" } } }
```

## 7.2. ENDPOINT FOR OBTAINING A LIST OF AN INTEGRATION'S ENVIRONMENT LABELS

This endpoint returns the environment labels (tags) that have been applied to the specified integration.

### Method and endpoint

```
GET
```

```
/public/integrations/{id}/tags
```

Table 7.2. Parameters

Name	Type	Description
Required Header Parameters		
<b>-H "Content-Type: &lt;media-type&gt;"</b>	<b>application/json</b>	Media type that the endpoint requires.
<b>-H "SYNDESIS-XSRF-TOKEN: awesome"</b>	Custom	Required for authentication.
<b>-H 'Authorization: Bearer &lt;token&gt; '</b>	Custom	Secret token for the OpenShift service account that exposes the Fuse Online public REST API. See <a href="#">Obtaining a secret token</a> .
Path Parameter		
<b>{id}</b>	string	Required path parameter. Name or internal ID of the integration whose environment labels you want to obtain. <a href="#">How to find integration IDs</a>

### Request example

In the following example, the endpoint returns the environment labels for the **timer-to-log** integration:

**/public/integrations/timer-to-log/tags**

### Produces

**application/json**

### Response example

```
{
  "test": {
    "name": "test",
    "releaseTag": "i-Lc5WI16UFtBjFR_ylggz",
    "lastTaggedAt": 1554887553159,
    "lastExportedAt": 1554887330152,
    "lastImportedAt": 1554888047271,
    "staging": {
      "name": "staging",
      "releaseTag": "i-Lc5WI16UFtBjFR_ylgfz",
      "lastTaggedAt": 1554887553159
    }
  }
}
```

## 7.3. ENDPOINT FOR MARKING AN INTEGRATION AND KEEPING UNSPECIFIED TAGS

This endpoint uses the **PATCH** method to mark the specified integration for the specified environment(s). If the integration is already marked for a specified environment, the endpoint updates the timestamp for that environment label. If the integration was previously marked for an environment that is not specified in a new request, the endpoint leaves that tag in place and does not update its timestamp.

This **PATCH** endpoint is a convenience method for CI/CD tools because it adds tags without the need to remove any other existing tags. This is in contrast to the **PUT** endpoint, which marks the integration for specified environments and removes any tags for environments that are not specified in the request.

### Method and endpoint

## PATCH

`/public/integrations/{id}/tags`

Table 7.3. Parameters

Name	Type	Description
Required Header Parameters		
<code>-H "Content-Type: &lt;media-type&gt;"</code>	<code>application/json</code>	Media type that the endpoint requires.
<code>-H "SYNDEESIS-XSRF-TOKEN: awesome"</code>	Custom	Required for authentication.
<code>-H 'Authorization: Bearer &lt;token&gt; '</code>	Custom	Secret token for the OpenShift service account that exposes the Fuse Online public REST API. See <a href="#">Obtaining a secret token</a> .
Path Parameter		
<code>{id}</code>	string	Required. Name or internal ID of the integration that you want to mark for the specified environment(s). See <a href="#">How to find integration IDs</a> .
Additional Parameters		
<code>--request PATCH</code>		Specify the <b>PATCH</b> method.
<code>-d [env{,...}]</code>	string	Required. Specify one or more, comma-separated, environment labels, that you want to add to the specified integration. You must have already created the environment label; the endpoint cannot create a label. See <a href="#">Marking integrations for CI/CD</a> .

### Request example

In the following example, the endpoint marks the **timer-to-log** integration for the **test2** and **test3** environments:

```
public/integrations/timer-to-log/tags --request PATCH -d ['test2','test3']
```

### Produces

`application/json`

### Response example

```
{"test2":{"name":"test2","releaseTag":"i-
```

```
LcXydouUFtBJfR_ylgrz","lastTaggedAt":1555365010746},"test3":
{"name":"test3","releaseTag":"i-LcXydouUFtBJfR_ylgsz","lastTaggedAt":1555365010746},"test":
{"name":"test","releaseTag":"i-
Lc5Wl16UFtBJfR_ylggz","lastTaggedAt":1554887553159,"lastExportedAt":1554887330152,"lastIm
portedAt":1554888047271},"staging":{"name":"staging","releaseTag":"i-
Lc5Wl16UFtBJfR_ylgfz","lastTaggedAt":1554887553159}}
```

## 7.4. ENDPOINT FOR MARKING AN INTEGRATION AND REMOVING UNSPECIFIED TAGS

This endpoint uses the **PUT** method to mark the specified integration for the specified environment(s). If the integration was previously marked for an environment that is not specified in the new request, the endpoint removes that environment label from the integration.

To mark an integration without removing unspecified environment labels, call the [PATCH method endpoint](#) instead.

### Method and endpoint

#### PUT

`/public/integrations/{id}/tags`

Table 7.4. Parameters

Name	Type	Description
Required Header Parameters		
<code>-H "Content-Type: &lt;media-type&gt;"</code>	<code>application/json</code>	Media type that the endpoint requires.
<code>-H "SYNDESIS-XSRF-TOKEN: awesome"</code>	Custom	Required for authentication.
<code>-H 'Authorization: Bearer &lt;token&gt; '</code>	Custom	Secret token for the OpenShift service account that exposes the Fuse Online public REST API. See <a href="#">Obtaining a secret token</a> .
Path Parameter		
<code>{id}</code>	string	Required. Name or internal ID of the integration that you want to mark. See <a href="#">How to find integration IDs</a>
Additional Parameters		
<code>--request PUT</code>		Specify the <b>PUT</b> method.

Name	Type	Description
<b>-d [env{,...}]</b>	string	Required. Specify one or more, comma-separated, environment labels. The endpoint marks the specified integration for these environments. You must have already created the environment label; the endpoint cannot create a label. See <a href="#">Marking integrations for CI/CD</a> .

### Request example

In the following example, the endpoint marks the **timer-to-log** integration for the **test2** and **test3** environments. If the integration was previously marked for any other environments, the endpoint removes those tags from the integration.

```
public/integrations/timer-to-log/tags --request PUT -d '["test2","test3"]'
```

### Produces

**application/json**

### Response example

```
{"test2":{"name":"test2","releaseTag":"i-LcXyw7GUFtBjFR_ylguz","lastTaggedAt":1555365085713},"test3":{"name":"test3","releaseTag":"i-LcXyw7GUFtBjFR_ylguz","lastTaggedAt":1555365085713}}
```

## 7.5. ENDPOINT FOR PUBLISHING AN INTEGRATION

This endpoint publishes the specified integration. If the integration is already running, then the endpoint stops the integration and re-publishes it.

### Method and endpoint

**POST**

**/public/integrations/{id}/deployments**

Table 7.5. Parameters

Name	Type	Description
Required Header Parameter		
<b>-H "Content-Type: &lt;media-type&gt;"</b>	<b>application/json</b>	Media type that the endpoint requires.
<b>-H "SYNDESIS-XSRF-TOKEN: awesome"</b>	Custom	Required for authentication.



Name	Type	Description
<b>-H 'Authorization: Bearer &lt;token&gt; '</b>	Custom	Secret token for the OpenShift service account that exposes the Fuse Online public REST API. See <a href="#">Obtaining a secret token</a> .
Path Parameters		
<b>{id}</b>	string	Required. Name or internal ID of the integration that you want to publish. See <a href="#">How to find integration IDs</a>

### Request example

In the following example, the endpoint publishes the **timer-to-log** integration.

**/public/integrations/timer-to-log/deployments**

### Produces

**application/json**

### Response example

In this example, the ellipsis indicates the omission of some of the response.

```
{
  "id": "i-Lc0JLrsUFtBJfR_ylfEz:8",
  "version": 8,
  "createdAt": 1555365135324,
  "updatedAt": 1555365135324,
  "userId": "system:serviceaccount:synthesis:synthesis-cd-client",
  "currentState": "Pending",
  "targetState": "Published",
  "integrationId": "i-Lc0JLrsUFtBJfR_ylfEz",
  "description": "Trigger events based on an interval or a cron expression",
  "isDerived": false,
  "stepKind": "endpoint",
  "configuredProperties": {
    "bodyLoggingEnabled": true,
    "contextLoggingEnabled": true,
    "metadata": {
      "configured": true,
      "stepKind": "log",
      "name": "Log"
    }
  },
  "continuousDeliveryState": {
    "test2": {
      "name": "test2",
      "releaseTag": "i-LcXyw7GUFtBJfR_ylgtz",
      "lastTaggedAt": 1555365085713
    },
    "test3": {
      "name": "test3",
      "releaseTag": "i-LcXyw7GUFtBJfR_ylguz",
      "lastTaggedAt": 1555365085713
    }
  }
}
```

## 7.6. ENDPOINT FOR STOPPING AN INTEGRATION

This endpoint stops the specified integration.

### Method and endpoint

**PUT**

**/public/integrations/{id}/deployments/stop**

Table 7.6. Parameters

Name	Type	Description
Required Header Parameters		
<b>-H "Content-Type: &lt;media-type&gt;"</b>	<b>application/json</b>	Media type that the endpoint requires.
<b>-H "SYNDESIS-XSRF-TOKEN: awesome"</b>	Custom	Required for authentication.
<b>-H 'Authorization: Bearer &lt;token&gt; '</b>	Custom	Secret token for the OpenShift service account that exposes the Fuse Online public REST API. See <a href="#">Obtaining a secret token</a> .
Path Parameter		
<b>{id}</b>	string	Required. Name or internal ID of the integration that you want to stop. See <a href="#">How to find integration IDs</a>

### Request example

In the following example, the endpoint stops the **timer-to-log** integration.

**/public/integrations/timer-to-log/deployments stop**

### Produces

**application/json**

### Response example

No content with a **204** status code

## 7.7. ENDPOINT FOR EXPORTING INTEGRATIONS

This endpoint exports integrations. The default behavior is that the endpoint exports integrations that are marked for the specified environment and that have never been exported or that have not been exported since the last time that they were marked for that environment. You can specify options when you want to do either of the following:

- Export all integrations in a Fuse Online environment and tag them with the specified environment label.
- Export all integrations that are tagged with the specified environment label regardless of whether or not an integration was updated and tagged since the last time it was exported.

See also: [Invoking the Fuse Online public API export endpoint](#).

### Method and endpoint

**GET**

**/public/integrations/{env}/export.zip**

Table 7.7. Parameters

Name	Type	Description
Required Header Parameters		
<b>-H "Content-Type: &lt;media-type&gt;"</b>	<b>multipart/form-data</b>	Media type that the endpoint requires.
<b>-H "SYNDESIS-XSRF-TOKEN: awesome"</b>	Custom	Required for authentication.
<b>-H 'Authorization: Bearer &lt;token&gt; '</b>	Custom	Secret token for the OpenShift service account that exposes the Fuse Online public REST API. See <a href="#">Obtaining a secret token</a> .
Path Parameter		
<b>{env}</b>	string	Required. Environment label that you created in the Fuse Online console. The endpoint exports the integrations that are marked for this environment.
Query Parameters		
<b>all=true</b>	string	Optional. Specify this option to export all integrations that are in the Fuse Online environment. The endpoint exports the current version of each integration. If an integration is not already marked for the specified environment, then the endpoint adds the specified environment label to the integration. You must have already created the environment label; the endpoint cannot create a label.
<b>ignoreTimestamp=true</b>	string	Export all integrations tagged with the specified environment label. Do this regardless of whether or not an integration was edited and tagged since the last time the integration was exported.
Additional Parameter		
<b>-o export.zip</b>	string	Required if you specify the query parameter. Without this option, the exported integrations are in a file named <b>export.zip?all=true</b> .

## Request examples

In the first example, the endpoint exports integrations that have been marked for the **test1** environment and that have never been exported or that have not been exported since the last time that they were marked for that environment.

```
/public/integrations/test1/export.zip
```

In the next example, the endpoint exports all integrations that have been marked for the **test1** environment. It does not matter whether or not the integration was updated since the last time it was exported.

```
/public/integrations/test1/export.zip?ignoreTimestamp=true -o export.zip
```

In the last example, the endpoint ensures that each integration is marked for the **test1** environment and returns all integrations in the **export.zip** file.

```
/public/integrations/test1/export.zip?all=true -o export.zip
```

## Produces

**application/octet-stream**

## Response

The **export.zip** file that contains the exported integration(s). The endpoint returns an HTTP status of **204** if there are no integrations to export.

## 7.8. ENDPOINT FOR IMPORTING INTEGRATIONS

This endpoint imports the integrations that are in the provided file. See also: [Invoking the Fuse Online public REST API import endpoint](#).

## Method and endpoint

**POST**

```
/public/integrations
```

Table 7.8. Parameters

Name	Type	Description
Required Header Parameters		
<b>-H "Content-Type: &lt;media-type&gt;"</b>	<b>multipart/form-data</b>	Media type that the endpoint requires.
<b>-H "SYNDESIS-XSRF-TOKEN: awesome"</b>	Custom	Required for authentication.
<b>-H 'Authorization: Bearer &lt;token&gt; '</b>	Custom	Secret token for the OpenShift service account that exposes the Fuse Online public REST API. See <a href="#">Obtaining a secret token</a> .

Name	Type	Description
Additional Parameters		
<b>data=@export.zip</b>	string	Required. This is the file that contains the integrations that you want to import. You must have previously invoked the export endpoint to obtain this file.
<b>environment={env}</b>	string	Required. Environment label that you want to add to each imported integration. You must have already created the environment label; the endpoint cannot create a label.

### Request example

In the following example, the endpoint imports the integrations that are in the **export.zip** file and marks them for the **testing** environment.

```
/public/integrations -F data=@export.zip -F environment=testing --request POST
```

### Produces

**multipart/form-data**

### Response example

The response is a list of the imported resources, which includes integrations and connections. In the following example, an ellipsis indicates that part of the response is omitted here.

```
{
  "lastImportedAt":1554888047271,"results":[{"id":"i-
  Lc0JLrsUFtBJfR_ylfEz","version":5,"createdAt":1554800274935,"updatedAt":0,"tags":
  [{"timer"},"name":"timer-to-log","flows":[{"id":"-Lc0I5AZEvfKCDDHC8Jv","steps":[{"id":"-
  Lc0I5jnEVfKCDDHC8Jv","configuredProperties":{"period":"900000"},"metadata":...
  "description":"Trigger events based on an interval or a cron
  expression","isDerived":false},"stepKind":"endpoint"},"id":"-
  Lc0I7wqEVfKCDDHC8Jv","configuredProperties":
  {"bodyLoggingEnabled":"true","contextLoggingEnabled":"true"},"metadata":
  {"configured":"true"},"stepKind":"log","name":"Log"}]}],"continuousDeliveryState":{"staging":
  {"name":"staging","releaseTag":"i-
  Lc5WI16UFtBJfR_ylgfz","lastTaggedAt":1554887553159},"test":{"name":"test","releaseTag":"i-
  Lc5WI16UFtBJfR_ylggz","lastTaggedAt":1554887553159,"lastExportedAt":1554887330152,"lastIm
  portedAt":1554887859824}}}]}
```

## 7.9. ENDPOINT FOR REMOVING AN ENVIRONMENT LABEL FROM A PARTICULAR INTEGRATION

This endpoint removes the specified environment label from the specified integration. The environment label itself continues to exist but it no longer marks the specified integration.

### Method and endpoint

**DELETE**

`/public/integrations/{id}/tags/{env}`

Table 7.9. Parameters

Name	Type	Description
Required Header Parameters		
<b>-H "Content-Type: &lt;media-type&gt;"</b>	<b>application/json</b>	Media type that the endpoint requires.
<b>-H "SYNDESI-XSRF-TOKEN: awesome"</b>	Custom	Required for authentication.
<b>-H 'Authorization: Bearer &lt;token&gt; '</b>	Custom	Secret token for the OpenShift service account that exposes the Fuse Online public REST API. See <a href="#">Obtaining a secret token</a> .
Path Parameters		
<b>{id}</b>	string	Required path parameter. Name or internal ID of the integration that you want to unmark. See <a href="#">How to find integration IDs</a> .
<b>{env}</b>	string	Required path parameter. Environment label that you want to remove from the specified integration.
Additional Parameter		
<b>--request DELETE</b>		Specify the <b>DELETE</b> method.

### Request example

In the following example, the endpoint removes the **dev1** environment label from the **timer-to-log** integration.

```
/public/integrations/timer-to-log/tags/dev1 --request DELETE
```

### Response example

No content with a **204** status code

## 7.10. ENDPOINT FOR CREATING AN ENVIRONMENT LABEL

This endpoint creates an environment label. No integrations are marked with this label until you explicitly mark them in the Fuse Online console or by invoking a public API endpoint.

### Method and endpoint

**POST**

**/public/environments/{env}**

Table 7.10. Parameters

Name	Type	Description
Required Header Parameters		
<b>-H "Content-Type: &lt;media-type&gt;"</b>	<b>application/json</b>	Media type that the endpoint requires.
<b>-H "SYNDESIS-XSRF-TOKEN: awesome"</b>	Custom	Required for authentication.
<b>-H 'Authorization: Bearer &lt;token&gt; '</b>	Custom	Secret token for the OpenShift service account that exposes the Fuse Online public REST API. See <a href="#">Obtaining a secret token</a> .
Path Parameter		
<b>{env}</b>	string	Required. Environment label that you want to create.

**Produces**

Does not produce anything but responds as follows:

Response	Description
<b>204 No Content</b>	Success.
<b>400 Bad Request</b>	The environment name you specified already exists.
<b>5xx errors</b>	The server is unable to fulfill the request.

**Request example**

In the following example, the endpoint creates the **dev1** environment label:

```
/public/environments/dev1 --request POST
```

The **dev1** environment label now exists in the Fuse Online environment in which you invoked this endpoint. There are not yet any integrations that are marked with this label.

**Response example**

No content with response status code **204**

**7.11. ENDPOINT FOR OBTAINING A LIST OF ENVIRONMENT LABELS**

This endpoint returns a list of environment labels that exist in the Fuse Online environment. You create environment labels in the Fuse Online console. See [Managing environment labels for CI/CD](#).

## Method and endpoint

### GET

`/public/environments[?withUses=true]`

Table 7.11. Parameters

Name	Type	Description
Required Header Parameters		
<b>-H "Content-Type: &lt;media-type&gt;"</b>	<b>application/json</b>	Media type that the endpoint requires.
<b>-H "SYNDESIS-XSRF-TOKEN: awesome"</b>	Custom	Required for authentication.
<b>-H 'Authorization: Bearer &lt;token&gt; '</b>	Custom	Secret token for the OpenShift service account that exposes the Fuse Online public REST API. See <a href="#">Obtaining a secret token</a> .
Path Parameter		
<b>withUses</b>	Boolean	Optional. If the command specifies <b>withUses=true</b> , the endpoint returns environment labels and the number of integrations that are marked with that label. If not specified, or set to <b>false</b> , the endpoint returns only environment labels.

## Produces

**application/json**

## Request examples

- `/public/environments`  
Response example:  
`["env-label-1", "env-label-2"]`
- `/public/environments/?withUses=true`  
Response example:  
`[{"name":"env-label-1","uses":1}, {"name":"env-label-2","uses":0}]`

## 7.12. ENDPOINT FOR CHANGING AN ENVIRONMENT LABEL

This endpoint changes an environment label. Integrations that were marked for the original environment label are now marked for the new environment label.



## Method and endpoint

### PUT

`/public/environments/{env}`

Table 7.12. Parameters

Name	Type	Description
Required Header Parameters		
<b>-H "Content-Type: &lt;media-type&gt;"</b>	<b>application/json</b>	Media type that the endpoint requires.
<b>-H "SYNDESIS-XSRF-TOKEN: awesome"</b>	Custom	Required for authentication.
<b>-H 'Authorization: Bearer &lt;token&gt; '</b>	Custom	Secret token for the OpenShift service account that exposes the Fuse Online public REST API. See <a href="#">Obtaining a secret token</a> .
Path Parameter		
<b>{env}</b>	string	Required. Environment label that you want to change.
Additional Parameters		
<b>-d {env}</b>	string	Required. Specify the new label for the environment. You must have already created the environment label; the endpoint cannot create a label.
<b>--request PUT</b>		Specify the <b>PUT</b> method.

### Request example

In the following example, the endpoint changes the **dev1** environment label to **dev2**:

```
/public/environments/dev1 -d 'dev2' --request PUT
```

Integrations that were marked for the **dev1** environment no longer have that tag. Those integrations are now marked for the **dev2** environment.

### Response example

No content with response status code **204**

## 7.13. ENDPOINT FOR REMOVING AN ENVIRONMENT LABEL FROM ALL INTEGRATIONS

This endpoint removes the specified environment label from each integration to which it has been applied.

## Method and endpoint

### DELETE

`/public/environments/{env}`

Table 7.13. Parameters

Name	Type	Description
Required Header Parameters		
<code>-H "Content-Type: &lt;media-type&gt;"</code>	<code>application/json</code>	Media type that the endpoint requires.
<code>-H "SYNDESIS-XSRF-TOKEN: awesome"</code>	Custom	Required for authentication.
<code>-H 'Authorization: Bearer &lt;token&gt; '</code>	Custom	Secret token for the OpenShift service account that exposes the Fuse Online public REST API. See <a href="#">Obtaining a secret token</a> .
Path Parameter		
<code>{env}</code>	string	Required. Environment label that you want to remove from integrations that have it.
Additional Parameter		
<code>--request DELETE</code>		Specify the <b>DELETE</b> method.

## Request example

In the following example, the endpoint removes the **dev1** tag from any integrations that have it:

```
/public/environments/dev1 --request DELETE
```

## Response example

No content with response status code **204**

## 7.14. ENDPOINT FOR CHANGING A CONNECTION'S PROPERTIES

This endpoint changes the properties of the specified connection. This is often useful after you import an integration that has connections that require configuration. For example, you might need to change the credentials that a connection uses.

## Method and endpoint

**POST****/public/connections/{id}/properties**

Table 7.14. Parameters

Name	Type	Description
Required Header Parameters		
<b>-H "Content-Type: &lt;media-type&gt;"</b>	<b>application/json</b>	Media type that the endpoint requires.
<b>-H "SYNDESI-XSRF-TOKEN: awesome"</b>	Custom	Required for authentication.
<b>-H 'Authorization: Bearer &lt;token&gt; '</b>	Custom	Secret token for the OpenShift service account that exposes the Fuse Online public REST API. See <a href="#">Obtaining a secret token</a> .
Path Parameter		
<b>{id}</b>	string	<p>Required. Replace <b>{id}</b> with the ID of the connection whose properties you want to change. For the connection ID, specify one of the following:</p> <ul style="list-style-type: none"> <li>• The connection's name, for example: <b>PostgresDB</b>. If the connection name has any spaces or special characters, then you must specify HTML escape characters.</li> <li>• The internal connection ID, which is in the Fuse Online console URL when you view a connection's details. To view a connection's details, in the left navigation panel, click <b>Connections</b>. Then click the connection whose details you want to view. When the connection details are visible in the browser, you would see something like this at the end of the URL: <b>/connections/i-Laupl8XznJ4LcuWwiwaz</b>. This connection's ID is <b>i-Laupl8XznJ4LcuWwiwaz</b>.</li> </ul>

**Request example**

The following example changes the properties of the **PostgresDB** connection. The new value of the **user** property is **myuser**, and the new value of the **password** property is **mypassword**:

```
/public/connections/PostgresDB/properties --request POST -d '{ "user": "myuser", "password": "mypassword" }'
```

Produces

application/json

Sample response

In this example, there is an ellipsis that indicates the omission of a large part of the response.

```
{"uses":0,"id":"i-LaOziUGpQE45nua4pfCz","name":"TODO app","configuredProperties":  
{"password":"»ENC:c2cb731046372a275b76beabc92aefa061f79b43fb791fb599d9e85ec0235a7e","  
basePath":"/api","host":"http://todo-syndesis.my-minishift.syndesis.io/","specification":...  
"userId":"admin","lastUpdated":1555365796629,"createdDate":1553066813379,"board":{"id":"i-  
Lbj4-vqUFtBJfR_ylfCz","metadata":{"connector-id":"i-LaOzcPZpQE45nua4pfBz","connector-  
version-latest":"1","connector-version-connection":"1"},"messages":  
[{"level":"WARN","code":"SYNDESIS007"}],"createdAt":1554494263030,"updatedAt":15544942637  
27,"targetResourceId":"i-  
LaOziUGpQE45nua4pfCz","notices":0,"warnings":1,"errors":0},"isDerived":false}
```

## CHAPTER 8. REBRANDING THE FUSE ONLINE USER INTERFACE

You can rebrand Fuse Online by replacing the Fuse Online application name, logo, icons, and other user interface details. You do this by mounting customized resources as **ConfigMap** objects in the **syndesis-ui** deployment file.

### Prerequisites

- Fuse Online is installed and running on OpenShift Container Platform on-site in a customer-managed environment.
- The **oc** client tool is connected to the OCP cluster in which Fuse Online is installed.
- You have permission to install Fuse Online.

### Procedure

1. Obtain the name of the **syndesis-ui** pod in which Fuse Online is installed by invoking the following command:  
**oc get pods**
2. Fetch customizable logos, icons, fonts, and backgrounds by invoking the following command and replacing *SYNDESIS\_UI\_POD\_NAME* with the actual name of the pod that is running **syndesis-ui**:  
**oc rsync SYNDESIS\_UI\_POD\_NAME:/opt/app-root/src/static/media ~/**

This puts user interface resources in the the **~/media/** folder.

3. Edit and save the file that contains the header logo, which is **~/media/syndesis\_logo\_full\_darkbkg.9c467d96.svg**.
4. Upload the modified file to the cluster by creating a **ConfigMap** object that contains the updated logo file:

```
cd ~/
oc create configmap syndesis-ui-custom-logo --from-
file=media/syndesis_logo_full_darkbkg.9c467d96.svg
```

5. Modify the **syndesis-ui** deployment file to mount the **syndesis-ui-custom-logo ConfigMap** object. Do this by invoking **oc edit dc/syndesis-ui** or by using the OpenShift web console, selecting **Applications > Deployments > syndesis-ui > Actions > Edit YAML**.

- a. Under **spec.template.containers.volumeMounts**, add the following:

```
-name: syndesis-ui-custom-logo-volume
  mountPath: /opt/app-root/src/static/media/syndesis_logo_full_darkbkg.9c467d96.svg
  subPath: syndesis_logo_full_darkbkg.9c467d96.svg
```

- b. Under **spec.template.volumes**, add the following:

```
-name: syndesis-ui-custom-logo-volume
  configMap:
    name: syndesis-ui-custom-logo
```

- c. Save the **syndesis-ui** deployment file.
6. Repeat steps 3 through 5 for each file that is in the `~/media` folder and that you want to customize.
7. Edit and save the file that contains the application title:

- a. Create a directory in which to update the file:

```
mkdir ~/syndesis-custom/src
```

- b. Fetch the application title file by invoking the following command and replacing `SYNDESIIS_UI_POD_NAME` with the actual name of the pod that is running **syndesis-ui**:

```
oc rsync SYNDESIIS_UI_POD_NAME:/opt/app-root/src/index.html ~/syndesis-custom/src
```

- c. Replace the application title. For example:

```
sed -i 's/<title>.*</title>/<title>NEW_TITLE</title>/g' ~/syndesis-custom/src/index.html
```

8. Upload the modified application title file to the cluster by creating a **ConfigMap** object that contains the updated file:

```
cd ~/syndesis-custom/src
oc create configmap syndesis-ui-custom-index --from-file=index.html
```

9. Modify the **syndesis-ui** deployment by mounting the **syndesis-ui-custom-index ConfigMap** object:
  - a. Under **spec.template.containers.volumeMounts**, add the following:

```
-name: syndesis-ui-custom-vindex-olume
mountPath: /opt/app-root/src/index.html
subPath: index.html
```

- b. Under **spec.template.volumes**, add the following:

```
-name: syndesis-ui-custom-index-volume
configMap:
  name: syndesis-ui-custom-index
```

- c. Save the **syndesis-ui** deployment file.

## Results

Saving the **syndesis-ui** deployment file automatically redeploys Fuse Online with a user interface that reflects your changes. Subsequent re-deployments of Fuse Online also reflect your changes.