



Red Hat OpenShift AI Self-Managed 2- latest

Installing and uninstalling OpenShift AI Self- Managed

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Abstract

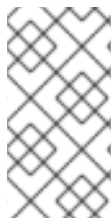
Install and uninstall OpenShift AI Self-Managed on your OpenShift Container Platform cluster.

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PREFACE

Learn how to use both the OpenShift command-line interface and web console to install Red Hat OpenShift AI Self-Managed on your OpenShift Container Platform cluster. To uninstall the product, learn how to use the recommended command-line interface (CLI) method.



NOTE

Red Hat recommends that you install only one instance of OpenShift AI on your cluster.

Installing the Red Hat OpenShift AI Operator on the same cluster as the Red Hat OpenShift AI Add-on is not recommended or supported.

CHAPTER 1. ARCHITECTURE OF OPENSIFT AI SELF-MANAGED

Red Hat OpenShift AI Self-Managed is an Operator that is available on a self-managed environment, such as Red Hat OpenShift Container Platform.

OpenShift AI integrates the following components and services:

- At the service layer:

OpenShift AI dashboard

A customer-facing dashboard that shows available and installed applications for the OpenShift AI environment as well as learning resources such as tutorials, quick starts, and documentation. Administrative users can access functionality to manage users, clusters, notebook images, accelerator profiles, and model-serving runtimes. Data scientists can use the dashboard to create projects to organize their data science work.

Model serving

Data scientists can deploy trained machine-learning models to serve intelligent applications in production. After deployment, applications can send requests to the model using its deployed API endpoint.

Data science pipelines

Data scientists can build portable machine learning (ML) workflows with data science pipelines, using Docker containers. This enables your data scientists to automate workflows as they develop their data science models.

Jupyter (self-managed)

A self-managed application that allows data scientists to configure their own notebook server environment and develop machine learning models in JupyterLab.

Distributed workloads

Data scientists can use multiple nodes in parallel to train machine-learning models or process data more quickly. This approach significantly reduces the task completion time, and enables the use of larger datasets and more complex models.



IMPORTANT

The distributed workloads feature is currently available in Red Hat OpenShift AI 2-latest as Technology Preview feature only. Technology Preview features are not supported with Red Hat production service level agreements (SLAs) and might not be functionally complete. Red Hat does not recommend using them in production. These features provide early access to upcoming product features, enabling customers to test functionality and provide feedback during the development process.

For more information about the support scope of Red Hat Technology Preview features, see [Technology Preview Features Support Scope](#).

- At the management layer:

The Red Hat OpenShift AI Operator

A meta-operator that deploys and maintains all components and sub-operators that are part of OpenShift AI.

Monitoring services

Prometheus gathers metrics from OpenShift AI for monitoring purposes.

When you install the Red Hat OpenShift AI Operator in the OpenShift Container Platform cluster, the following new projects are created:

- The **redhat-ods-operator** project contains the Red Hat OpenShift AI Operator.
- The **redhat-ods-applications** project installs the dashboard and other required components of OpenShift AI.
- The **redhat-ods-monitoring** project contains services for monitoring.
- The **rhods-notebooks** project is where notebook environments are deployed by default.

You or your data scientists must create additional projects for the applications that will use your machine learning models.

Do not install independent software vendor (ISV) applications in namespaces associated with OpenShift AI.

CHAPTER 2. INSTALLING AND DEPLOYING OPENSIFT AI

Red Hat OpenShift AI is a platform for data scientists and developers of artificial intelligence (AI) applications. It provides a fully supported environment that lets you rapidly develop, train, test, and deploy machine learning models on-premises and/or in the public cloud.

OpenShift AI is provided as a managed cloud service add-on for Red Hat OpenShift or as self-managed software that you can install on-premise or in the public cloud on OpenShift.

For information about installing OpenShift AI as self-managed software on your OpenShift cluster in a disconnected environment, see [Installing and uninstalling OpenShift AI Self-Managed in a disconnected environment](#). For information about installing OpenShift AI as a managed cloud service add-on, see [Installing and uninstalling OpenShift AI](#).

Installing OpenShift AI involves the following high-level tasks:

1. Confirm that your OpenShift Container Platform cluster meets all requirements. See [Requirements for OpenShift AI Self-Managed](#).
2. Add administrative users for OpenShift Container Platform. See [Adding administrative users for OpenShift Container Platform](#).
3. Install the Red Hat OpenShift AI Operator. See [Installing the Red Hat OpenShift AI Operator](#).
4. Install OpenShift AI components. See [Installing and managing Red Hat OpenShift AI components](#).
5. Configure user and administrator groups to provide user access to OpenShift AI. See [Adding users](#).
6. Access the OpenShift AI dashboard. See [Accessing the OpenShift AI dashboard](#).
7. Optionally, enable graphics processing units (GPUs) in OpenShift AI to ensure that your data scientists can use compute-heavy workloads in their models. See [Enabling GPU support in OpenShift AI](#).

2.1. REQUIREMENTS FOR OPENSIFT AI SELF-MANAGED

Your environment must meet certain requirements to receive support for Red Hat OpenShift AI.

Installation requirements

You must meet the following requirements before you are able to install OpenShift AI on your Red Hat OpenShift Container Platform cluster.

- **Product subscriptions**
 - A subscription for Red Hat OpenShift AI Self-Managed
Contact your Red Hat account manager to purchase new subscriptions. If you do not yet have an account manager, complete the form at <https://www.redhat.com/en/contact> to request one.
- **An OpenShift Container Platform cluster 4.12 or greater**
 - Use an existing cluster or create a new cluster by following the OpenShift Container Platform documentation: [OpenShift Container Platform installation overview](#).

Your cluster must have at least 2 worker nodes with at least 8 CPUs and 32 GiB RAM available for OpenShift AI to use when you install the Operator. To ensure that OpenShift AI is usable, additional cluster resources are required beyond the minimum requirements.

- A default storage class that can be dynamically provisioned must be configured. Confirm that a default storage class is configured by running the **oc get storageclass** command. If no storage classes are noted with **(default)** beside the name, follow the OpenShift Container Platform documentation to configure a default storage class: [Changing the default storage class](#). For more information about dynamic provisioning, see [Dynamic provisioning](#).
- Open Data Hub must not be installed on the cluster. For more information about managing the machines that make up an OpenShift cluster, see [Overview of machine management](#).

- **An identity provider configured for OpenShift Container Platform**

Access to the cluster as a user with the **cluster-admin** role; the **kubeadmin** user is not allowed.

Red Hat OpenShift AI supports the same authentication systems as Red Hat OpenShift Container Platform. See [Understanding identity provider configuration](#) for more information on configuring identity providers.

- **Internet access**

Along with Internet access, the following domains must be accessible during the installation of OpenShift AI Self-Managed:

- cdn.redhat.com
- subscription.rhn.redhat.com
- registry.access.redhat.com
- registry.redhat.io
- quay.io

For CUDA-based images, the following domains must be accessible:

- ngc.download.nvidia.cn
- developer.download.nvidia.com

- **OpenShift Pipelines operator installation**

- The Red Hat OpenShift Pipelines operator enables support for installation of pipelines in a self-managed environment. Before you use data science pipelines in OpenShift AI, you must install the Red Hat OpenShift Pipelines Operator. For more information, see [Installing OpenShift Pipelines](#). If your deployment is in a disconnected self-managed environment, see [Red Hat OpenShift Pipelines Operator in a restricted environment](#).
- Before you can execute a pipeline in a disconnected environment, you must mirror any images used by your pipelines to a private registry.
- You can store your pipeline artifacts in an Amazon Web Services (AWS) Simple Storage Service (S3) bucket to ensure that you do not consume local storage. To do this, you must first configure write access to your S3 bucket on your AWS account.

If you do not have access to Amazon S3 storage, you must configure your own storage solution for use with pipelines.

- **Install KServe dependencies**

To support KServe components, you must install dependent Operators, including the Red Hat OpenShift Serverless and Red Hat OpenShift Service Mesh Operators. For more information, see [Serving large models](#).

2.2. ADDING ADMINISTRATIVE USERS FOR OPENSIFT CONTAINER PLATFORM

Before you can install and configure OpenShift AI for your data scientist users, you must define administrative users. Only users with the **cluster-admin** role can install and configure OpenShift AI.

For more information about creating a cluster admin user, see [Creating a cluster admin](#).

2.3. INSTALLING THE RED HAT OPENSIFT AI OPERATOR

This section shows how to install the Red Hat OpenShift AI Operator on your OpenShift Container Platform cluster using the command-line interface (CLI) and the OpenShift web console.



NOTE

If you want to upgrade from a previous version of OpenShift AI rather than performing a new installation, see [Upgrading OpenShift AI](#).



NOTE

If your OpenShift cluster uses a proxy to access the Internet, you can configure the proxy settings for the Red Hat OpenShift AI Operator. See [Overriding proxy settings of an Operator](#) for more information.

2.3.1. Installing the Red Hat OpenShift AI Operator by using the CLI

The following procedure shows how to use the OpenShift command-line interface (CLI) to install the Red Hat OpenShift AI Operator on your OpenShift Container Platform cluster. You must install the Operator before you can install OpenShift AI components on the cluster.

Prerequisites

- You have a running OpenShift Container Platform cluster, version 4.12 or greater, configured with a default storage class that can be dynamically provisioned.
- You have cluster administrator privileges for your OpenShift Container Platform cluster.
- You have downloaded and installed the OpenShift command-line interface (CLI). See [Installing the OpenShift CLI](#).
- To support KServe components, you installed the dependent Operators, including the Red Hat OpenShift Serverless and Red Hat OpenShift Service Mesh Operators. For more information, see [Serving large models](#).

Procedure

1. Open a new terminal window.
2. In the OpenShift command-line interface (CLI), log in to your OpenShift Container Platform cluster as a cluster administrator, as shown in the following example:

```
$ oc login <openshift_cluster_url> -u <admin_username> -p <password>
```

3. Create a namespace for installation of the Operator by performing the following actions:
 - a. Create a namespace YAML file, for example, **rhods-operator-namespace.yaml**.

```
apiVersion: v1
kind: Namespace
metadata:
  name: redhat-ods-operator 1
```

1 **redhat-ods-operator** is the recommended namespace for the Operator.

- b. Create the namespace in your OpenShift Container Platform cluster.

```
$ oc create -f rhods-operator-namespace.yaml
```

You see output similar to the following:

```
namespace/redhat-ods-operator created
```

4. Create an operator group for installation of the Operator by performing the following actions:
 - a. Create an **OperatorGroup** object custom resource (CR) file, for example, **rhods-operator-group.yaml**.

```
apiVersion: operators.coreos.com/v1
kind: OperatorGroup
metadata:
  name: rhods-operator
  namespace: redhat-ods-operator 1
```

1 You must specify the same namespace that you created earlier in this procedure.

- b. Create the **OperatorGroup** object in your OpenShift Container Platform cluster.

```
$ oc create -f rhods-operator-group.yaml
```

You see output similar to the following:

```
operatorgroup.operators.coreos.com/rhods-operator created
```

5. Create a subscription for installation of the Operator by performing the following actions:
 - a. Create a **Subscription** object CR file, for example, **rhods-operator-subscription.yaml**.

```
apiVersion: operators.coreos.com/v1alpha1
```

```

kind: Subscription
metadata:
  name: rhods-operator
  namespace: redhat-ods-operator 1
spec:
  name: rhods-operator
  channel: stable 2
  source: redhat-operators
  sourceNamespace: openshift-marketplace

```

- 1** You must specify the same namespace that you created earlier in this procedure.
- 2** For **channel**, select a value of **fast**, **stable**, **stable-2-latest**, **eus-2-latest**, or **alpha**. The following table describes these channels. For more information, including the lifecycle associated with each of the available subscription channels, see [Red Hat OpenShift AI Self-Managed Life Cycle](#).

Channel	Support	Release frequency	Recommended environment
fast	One month of full support	Every month	<p>Production environments with access to the latest product features.</p> <p>Select this streaming channel with automatic upgrades to avoid manually upgrading every month.</p>
stable	Three months of full support	Every three months	<p>Production environments with stability prioritized over new feature availability.</p> <p>Select this streaming channel with automatic upgrades to access the latest stable release and avoid manually upgrading.</p>
stable-x.y	Seven months of full support	Every three months	<p>Production environments with stability prioritized over new feature availability.</p> <p>Select numbered stable channels (such as stable-2-latest) to plan and execute the upgrade to the next stable release while keeping your deployment under full support.</p>
eus-x.y	Seven months of full support followed by Extended Update Support for eleven months	Every nine months	<p>Enterprise-grade environments that cannot upgrade within a seven month window.</p> <p>Select this streaming channel if you prioritize stability over new feature availability.</p>

Channel	Support	Release frequency	Recommended environment
alpha	One month of full support	Every month	<p>Development environments with early-access features that might not be functionally complete.</p> <p>Select this channel to use early-access features that enable you to test functionality and provide feedback during the development process. Early-access features are not supported with Red Hat production service level agreements (SLAs).</p> <p>For more information about the support scope of Red Hat Technology Preview features, see Technology Preview Features Support Scope. For more information about the support scope of Red Hat Developer Preview features, see Developer Preview Features Support Scope.</p>

**NOTE**

The **embedded** and **beta** channels are legacy channels that will be removed in a future release. Do not select the **embedded** or **beta** channels for a new installation of the Operator.

- b. As described in the preceding step, ensure that the subscription channel you specify is appropriate for your organization's requirements.
- c. Create the **Subscription** object in your OpenShift Container Platform cluster to install the Operator.

```
$ oc create -f rhods-operator-subscription.yaml
```

You see output similar to the following:

```
subscription.operators.coreos.com/rhods-operator created
```

Verification

- In the OpenShift Container Platform web console, click **Operators** → **Installed Operators** and confirm that the Red Hat OpenShift AI Operator shows one of the following statuses:
 - **Installing** - installation is in progress; wait for this to change to **Succeeded**. This might take several minutes.
 - **Succeeded** - installation is successful.
- In the web console, click **Home** → **Projects** and confirm that the following project namespaces are visible and listed as **Active**:

- **redhat-ods-applications**
- **redhat-ods-monitoring**
- **redhat-ods-operator**

Additional resources

- [Installing and managing Red Hat OpenShift AI components](#)
- [Adding users](#)
- [Adding Operators to a cluster](#)

2.3.2. Installing the Red Hat OpenShift AI Operator by using the web console

The following procedure shows how to use the OpenShift Container Platform web console to install the Red Hat OpenShift AI Operator on your cluster. You must install the Operator before you can install OpenShift AI components on the cluster.

Prerequisites

- You have a running OpenShift Container Platform cluster, version 4.12 or greater, configured with a default storage class that can be dynamically provisioned.
- You have cluster administrator privileges for your OpenShift Container Platform cluster.
- To support KServe components, you installed the dependent Operators, including the Red Hat OpenShift Serverless and Red Hat OpenShift Service Mesh Operators. For more information, see [Serving large models](#).

Procedure

1. Log in to the OpenShift Container Platform web console as a cluster administrator.
2. In the web console, click **Operators** → **OperatorHub**.
3. On the **OperatorHub** page, locate the Red Hat OpenShift AI Operator by scrolling through available Operators or by typing *Red Hat OpenShift AI* into the **Filter by keyword** box.
4. Select the Operator to display additional information.
5. Read the information about the Operator and click **Install**.
6. For **Update channel**, select a value of **fast**, **stable**, **stable-2-latest**, **eus-2-latest**, or **alpha**. The following table describes these channels. For more information, including the lifecycle associated with each of the available subscription channels, see [Red Hat OpenShift AI Self-Managed Life Cycle](#).

Channel	Support	Release frequency	Recommended environment

Channel	Support	Release frequency	Recommended environment
fast	One month of full support	Every month	<p>Production environments with access to the latest product features.</p> <p>Select this streaming channel with automatic upgrades to avoid manually upgrading every month.</p>
stable	Three months of full support	Every three months	<p>Production environments with stability prioritized over new feature availability.</p> <p>Select this streaming channel with automatic upgrades to access the latest stable release and avoid manually upgrading.</p>
stable-x.y	Seven months of full support	Every three months	<p>Production environments with stability prioritized over new feature availability.</p> <p>Select numbered stable channels (such as stable-2-latest) to plan and execute the upgrade to the next stable release while keeping your deployment under full support.</p>
eus-x.y	Seven months of full support followed by Extended Update Support for eleven months	Every nine months	<p>Enterprise-grade environments that cannot upgrade within a seven month window.</p> <p>Select this streaming channel if you prioritize stability over new feature availability.</p>

Channel	Support	Release frequency	Recommended environment
alpha	One month of full support	Every month	<p>Development environments with early-access features that might not be functionally complete.</p> <p>Select this channel to use early-access features that enable you to test functionality and provide feedback during the development process. Early-access features are not supported with Red Hat production service level agreements (SLAs).</p> <p>For more information about the support scope of Red Hat Technology Preview features, see Technology Preview Features Support Scope. For more information about the support scope of Red Hat Developer Preview features, see Developer Preview Features Support Scope.</p>

**NOTE**

The **embedded** and **beta** channels are legacy channels that will be removed in a future release. Do not select the **embedded** or **beta** channels for a new installation of the Operator.

7. For **Installation mode**, observe that the only available value is **All namespaces on the cluster (default)**. This installation mode makes the Operator available to all namespaces in the cluster.
8. For **Installed Namespace**, select **redhat-ods-operator (Operator recommended)**.
9. Under **Update approval**, select either **Automatic** or **Manual**.
10. Click **Install**.
An installation pane opens. When the installation finishes, a checkmark appears beside the Operator name in the installation pane.

Verification

- In the OpenShift Container Platform web console, click **Operators → Installed Operators** and confirm that the Red Hat OpenShift AI Operator shows one of the following statuses:
 - **Installing** - installation is in progress; wait for this to change to **Succeeded**. This might take several minutes.
 - **Succeeded** - installation is successful.
- In the web console, click **Home → Projects** and confirm that the following project namespaces are visible and listed as **Active**:
 - **redhat-ods-applications**
 - **redhat-ods-monitoring**

- **redhat-ods-operator**

Additional resources

- [Installing and managing Red Hat OpenShift AI components](#)
- [Adding users](#)
- [Adding Operators to a cluster](#)

2.4. INSTALLING AND MANAGING RED HAT OPENSIFT AI COMPONENTS

The following procedures show how to use the command-line interface (CLI) and OpenShift Container Platform web console to install and manage components of Red Hat OpenShift AI on your OpenShift Container Platform cluster.

2.4.1. Installing Red Hat OpenShift AI components by using the CLI

The following procedure shows how to use the OpenShift command-line interface (CLI) to install specific components of Red Hat OpenShift AI on your OpenShift Container Platform cluster.



IMPORTANT

The following procedure describes how to create and configure a **DataScienceCluster** object to install Red Hat OpenShift AI components as part of a *new* installation. However, if you upgraded from version 1 of OpenShift AI (previously OpenShift Data Science), the upgrade process automatically created a default **DataScienceCluster** object. If you upgraded from version 2.4 to 2.5, the upgrade process uses the settings from the 2.4 version's **DataScienceCluster** object. To inspect the default **DataScienceCluster** object and change the installation status of Red Hat OpenShift AI components, see [Updating the installation status of Red Hat OpenShift AI components by using the web console](#).

Prerequisites

- To support the KServe component, you installed dependent Operators, including the Red Hat OpenShift Serverless and Red Hat OpenShift Service Mesh Operators. For more information, see [Serving large models](#).
- The Red Hat OpenShift AI Operator is installed on your OpenShift Container Platform cluster. See [Installing the Red Hat OpenShift AI Operator](#).
- You have cluster administrator privileges for your OpenShift Container Platform cluster.
- You have downloaded and installed the OpenShift command-line interface (CLI). See [Installing the OpenShift CLI](#).

Procedure

1. Open a new terminal window.
2. In the OpenShift command-line interface (CLI), log in to your on your OpenShift Container Platform cluster as a cluster administrator, as shown in the following example:

```
$ oc login <openshift_cluster_url> -u <admin_username> -p <password>
```

3. Create a **DataScienceCluster** object custom resource (CR) file, for example, **rhods-operator-dsc.yaml**.

```
apiVersion: datasciencecluster.opendatahub.io/v1
kind: DataScienceCluster
metadata:
  name: default-dsc
spec:
  components:
    codeflare:
      managementState: Removed
    dashboard:
      managementState: Removed
    datasciencepipelines:
      managementState: Removed
    kserve:
      managementState: Removed
    modelmeshserving:
      managementState: Removed
    ray:
      managementState: Removed
    workbenches:
      managementState: Removed
```

4. In the **spec.components** section of the CR, for each OpenShift AI component shown, set the value of the **managementState** field to either **Managed** or **Removed**. These values are defined as follows:

Managed

The Operator actively manages the component, installs it, and tries to keep it active. The Operator will upgrade the component only if it is safe to do so.

Removed

The Operator actively manages the component but does not install it. If the component is already installed, the Operator will try to remove it.



IMPORTANT

- To learn how to install the KServe component, which is used by the single model serving platform to serve large models, see [Serving large models](#).
- The CodeFlare and KubeRay components are Technology Preview features only. Technology Preview features are not supported with Red Hat production service level agreements (SLAs) and might not be functionally complete. Red Hat does not recommend using them in production. These features provide early access to upcoming product features, enabling customers to test functionality and provide feedback during the development process. For more information about the support scope of Red Hat Technology Preview features, see [Technology Preview Features Support Scope](#).
- To learn how to configure the distributed workloads feature that uses the CodeFlare and KubeRay components, see [Configuring distributed workloads](#).

5. Create the **DataScienceCluster** object in your OpenShift Container Platform cluster to install the specified OpenShift AI components.

```
$ oc create -f rhods-operator-dsc.yaml
```

You see output similar to the following:

```
datasciencecluster.datasciencecluster.opendatahub.io/default created
```

Verification

- Confirm that there is a running pod for each component:
 1. In the OpenShift Container Platform web console, click **Workloads** → **Pods**.
 2. In the **Project** list at the top of the page, select **redhat-ods-applications**.
 3. In the applications namespace, confirm that there are running pods for each of the OpenShift AI components that you installed.
- Confirm the status of all installed components:
 1. In the OpenShift Container Platform web console, click **Operators** → **Installed Operators**.
 2. Click the Red Hat OpenShift AI Operator.
 3. Click the **Data Science Cluster** tab and select the **DataScienceCluster** object called **default-dsc**.
 4. Select the **YAML** tab.
 5. In the **installedComponents** section, confirm that the components you installed have a status value of **true**.



NOTE

If a component shows with the **component-name: {}** format in the **spec.components** section of the CR, the component is not installed.

2.4.2. Installing Red Hat OpenShift AI components by using the web console

The following procedure shows how to use the OpenShift Container Platform web console to install specific components of Red Hat OpenShift AI on your cluster.



IMPORTANT

The following procedure describes how to create and configure a **DataScienceCluster** object to install Red Hat OpenShift AI components as part of a *new* installation. However, if you upgraded from version 1 of OpenShift AI (previously OpenShift Data Science), the upgrade process automatically created a default **DataScienceCluster** object. If you upgraded from a previous minor version, the upgrade process used the settings from the previous version's **DataScienceCluster** object. To inspect the **DataScienceCluster** object and change the installation status of Red Hat OpenShift AI components, see [Updating the installation status of Red Hat OpenShift AI components by using the web console](#).

Prerequisites

- To support the KServe component, you installed dependent Operators, including the Red Hat OpenShift Serverless and Red Hat OpenShift Service Mesh Operators. For more information, see [Serving large models](#).
- The Red Hat OpenShift AI Operator is installed on your OpenShift Container Platform cluster. See [Installing the Red Hat OpenShift AI Operator](#).
- You have cluster administrator privileges for your OpenShift Container Platform cluster.

Procedure

1. Log in to the OpenShift Container Platform web console as a cluster administrator.
2. In the web console, click **Operators** → **Installed Operators** and then click the Red Hat OpenShift AI Operator.
3. Create a **DataScienceCluster** object to install OpenShift AI components by performing the following actions:
 - a. Click the **Data Science Cluster** tab.
 - b. Click **Create DataScienceCluster**.
 - c. For **Configure via**, select **YAML view**.
An embedded YAML editor opens showing a default custom resource (CR) for the **DataScienceCluster** object.
 - d. In the **spec.components** section of the CR, for each OpenShift AI component shown, set the value of the **managementState** field to either **Managed** or **Removed**. These values are defined as follows:

Managed

The Operator actively manages the component, installs it, and tries to keep it active. The Operator will upgrade the component only if it is safe to do so.

Removed

The Operator actively manages the component but does not install it. If the component is already installed, the Operator will try to remove it.



IMPORTANT

- To learn how to install the KServe component, which is used by the single model serving platform to serve large models, see [Serving large models](#).
- The CodeFlare and KubeRay components are Technology Preview features only. Technology Preview features are not supported with Red Hat production service level agreements (SLAs) and might not be functionally complete. Red Hat does not recommend using them in production. These features provide early access to upcoming product features, enabling customers to test functionality and provide feedback during the development process. For more information about the support scope of Red Hat Technology Preview features, see [Technology Preview Features Support Scope](#).
- To learn how to configure the distributed workloads feature that uses the CodeFlare and KubeRay components, see [Configuring distributed workloads](#).

4. Click **Create**.

Verification

- Confirm that there is a running pod for each component:
 1. In the OpenShift Container Platform web console, click **Workloads** → **Pods**.
 2. In the **Project** list at the top of the page, select **redhat-ods-applications**.
 3. In the applications namespace, confirm that there are running pods for each of the OpenShift AI components that you installed.
- Confirm the status of all installed components:
 1. In the OpenShift Container Platform web console, click **Operators** → **Installed Operators**.
 2. Click the Red Hat OpenShift AI Operator.
 3. Click the **Data Science Cluster** tab and select the **DataScienceCluster** object called **default-dsc**.
 4. Select the **YAML** tab.
 5. In the **installedComponents** section, confirm that the components you installed have a status value of **true**.



NOTE

If a component shows with the **component-name: {}** format in the **spec.components** section of the CR, the component is not installed.

2.4.3. Updating the installation status of Red Hat OpenShift AI components by using the web console

The following procedure shows how to use the OpenShift Container Platform web console to update the installation status of components of Red Hat OpenShift AI on your OpenShift Container Platform cluster.



IMPORTANT

If you upgraded from version 1 to version 2 of OpenShift AI, the upgrade process automatically created a default **DataScienceCluster** object and enabled several components of OpenShift AI. If you upgraded from a previous minor version, the upgrade process used the settings from the previous version's **DataScienceCluster** object.

The following procedure describes how to edit the **DataScienceCluster** object:

- Change the installation status of the existing Red Hat OpenShift AI components
- Add additional components to the **DataScienceCluster** object that were not available in the previous version of OpenShift AI.

Prerequisites

- To support the KServe component, you installed dependent Operators, including the Red Hat OpenShift Serverless and Red Hat OpenShift Service Mesh Operators. For more information, see [Serving large models](#).
- The Red Hat OpenShift AI Operator is [installed](#) on your OpenShift Container Platform cluster.
- You have cluster administrator privileges for your OpenShift Container Platform cluster.

Procedure

1. Log in to the OpenShift Container Platform web console as a cluster administrator.
2. In the web console, click **Operators** → **Installed Operators** and then click the Red Hat OpenShift AI Operator.
3. Click the **Data Science Cluster** tab.
4. On the **DataScienceClusters** page, click the **default** object.
5. Click the **YAML** tab.
An embedded YAML editor opens showing the custom resource (CR) file for the **DataScienceCluster** object.
6. In the **spec.components** section of the CR, for each OpenShift AI component shown, set the value of the **managementState** field to either **Managed** or **Removed**. These values are defined as follows:



NOTE

If a component shows with the **component-name: {}** format in the **spec.components** section of the CR, the component is not installed.

Managed

The Operator actively manages the component, installs it, and tries to keep it active. The Operator will upgrade the component only if it is safe to do so.

Removed

The Operator actively manages the component but does not install it. If the component is already installed, the Operator will try to remove it.



IMPORTANT

- To learn how to install the KServe component, which is used by the single model serving platform to serve large models, see [Serving large models](#).
- If they are not already present in the CR file, you can install the CodeFlare and KubeRay features by adding components called **codeflare** and **ray** to the **spec.components** section of the CR and setting the **managementState** field for the components to **Managed**.
- The CodeFlare and KubeRay components are Technology Preview features only. Technology Preview features are not supported with Red Hat production service level agreements (SLAs) and might not be functionally complete. Red Hat does not recommend using them in production. These features provide early access to upcoming product features, enabling customers to test functionality and provide feedback during the development process. For more information about the support scope of Red Hat Technology Preview features, see [Technology Preview Features Support Scope](#).
- To learn how to configure the distributed workloads feature that uses the CodeFlare and KubeRay components, see [Configuring distributed workloads](#).

7. Click **Save**.

For any components that you updated, OpenShift AI initiates a rollout that affects all pods to use the updated image.

Verification

- Confirm that there is a running pod for each component:
 1. In the OpenShift Container Platform web console, click **Workloads** → **Pods**.
 2. In the **Project** list at the top of the page, select **redhat-ods-applications**.
 3. In the applications namespace, confirm that there are running pods for each of the OpenShift AI components that you installed.
- Confirm the status of all installed components:
 1. In the OpenShift Container Platform web console, click **Operators** → **Installed Operators**.
 2. Click the Red Hat OpenShift AI Operator.
 3. Click the **Data Science Cluster** tab and select the **DataScienceCluster** object called **default-dsc**.
 4. Select the **YAML** tab.
 5. In the **installedComponents** section, confirm that the components you installed have a status value of **true**.



NOTE

If a component shows with the **component-name: {}** format in the **spec.components** section of the CR, the component is not installed.

CHAPTER 3. WORKING WITH CERTIFICATES

Certificates are used by various components in OpenShift Container Platform to validate access to the cluster. For clusters that rely on self-signed certificates, you can add those self-signed certificates to a cluster-wide Certificate Authority (CA) bundle and use the CA bundle in Red Hat OpenShift AI. You can also use self-signed certificates in a custom CA bundle that is separate from the cluster-wide bundle. Administrators can add a CA bundle, remove a CA bundle from all namespaces, remove a CA bundle from individual namespaces, or manually manage certificate changes instead of the system.

3.1. UNDERSTANDING CERTIFICATES IN OPENSIFT AI

For OpenShift Container Platform clusters that rely on self-signed certificates, you can add those self-signed certificates to a cluster-wide Certificate Authority (CA) bundle (**ca-bundle.crt**) and use the CA bundle in Red Hat OpenShift AI. You can also use self-signed certificates in a custom CA bundle (**odh-ca-bundle.crt**) that is separate from the cluster-wide bundle.

3.1.1. How CA bundles are injected

After installing OpenShift AI, the Red Hat OpenShift AI Operator automatically creates an empty **odh-trusted-ca-bundle** configuration file (ConfigMap), and the Cluster Network Operator (CNO) injects the cluster-wide CA bundle into the **odh-trusted-ca-bundle** configMap with the label "config.openshift.io/inject-trusted-cabundle". The components deployed in the affected namespaces are responsible for mounting this configMap as a volume in the deployment pods.

```
apiVersion: v1
kind: ConfigMap
metadata:
  labels:
    app.kubernetes.io/part-of: opendatahub-operator
    config.openshift.io/inject-trusted-cabundle: 'true'
name: odh-trusted-ca-bundle
```

After the CNO operator injects the bundle, it updates the ConfigMap with the **ca-bundle.crt** file containing the certificates.

```
apiVersion: v1
kind: ConfigMap
metadata:
  labels:
    app.kubernetes.io/part-of: opendatahub-operator
    config.openshift.io/inject-trusted-cabundle: 'true'
name: odh-trusted-ca-bundle
data:
  ca-bundle.crt: |
    <BUNDLE OF CLUSTER-WIDE CERTIFICATES>
```

3.1.2. How the ConfigMap is managed

By default, the Red Hat OpenShift AI Operator manages the **odh-trusted-ca-bundle** ConfigMap. If you want to manage or remove the **odh-trusted-ca-bundle** ConfigMap, or add a custom CA bundle (**odh-ca-bundle.crt**) separate from the cluster-wide CA bundle (**ca-bundle.crt**), you can use the **trustedCABundle** property in the Operator's DSC Initialization (DSCI) object.

```
spec:
  trustedCABundle:
    managementState: Managed
    customCABundle: ""
```

In the Operator's DSCI object, you can set the **spec.trustedCABundle.managementState** field to the following values:

- **Managed:** The Red Hat OpenShift AI Operator manages the **odh-trusted-ca-bundle** ConfigMap and adds it to all non-reserved existing and new namespaces (the ConfigMap is not added to any reserved or system namespaces, such as **default**, **openshift-*** or **kube-***). The ConfigMap is automatically updated to reflect any changes made to the **customCABundle** field. This is the default value after installing Red Hat OpenShift AI.
- **Removed:** The Red Hat OpenShift AI Operator removes the **odh-trusted-ca-bundle** ConfigMap (if present) and disables the creation of the ConfigMap in new namespaces. If you change this field from **Managed** to **Removed**, the **odh-trusted-ca-bundle** ConfigMap is also deleted from namespaces. This is the default value after upgrading Red Hat OpenShift AI from 2.7 or earlier versions to 2-latest.
- **Unmanaged:** The Red Hat OpenShift AI Operator does not manage the **odh-trusted-ca-bundle** ConfigMap, allowing for an administrator to manage it instead. Changing the **managementState** from **Managed** to **Unmanaged** does not remove the **odh-trusted-ca-bundle** ConfigMap, but the ConfigMap is not updated if you make changes to the **customCABundle** field.

In the Operator's DSCI object, you can add a custom certificate to the **spec.trustedCABundle.customCABundle** field. This adds the **odh-ca-bundle.crt** file containing the certificates to the **odh-trusted-ca-bundle** ConfigMap, as shown in the following example:

```
apiVersion: v1
kind: ConfigMap
metadata:
  labels:
    app.kubernetes.io/part-of:.opendatahub-operator
    config.openshift.io/inject-trusted-cabundle: 'true'
  name: odh-trusted-ca-bundle
data:
  ca-bundle.crt: |
    <BUNDLE OF CLUSTER-WIDE CERTIFICATES>
  odh-ca-bundle.crt: |
    <BUNDLE OF CUSTOM CERTIFICATES>
```

3.2. ADDING A CA BUNDLE

There are two ways to add a Certificate Authority (CA) bundle to OpenShift AI. You can use one or both of these methods:

- For OpenShift Container Platform clusters that rely on self-signed certificates, you can add those self-signed certificates to a cluster-wide Certificate Authority (CA) bundle (**ca-bundle.crt**) and use the CA bundle in Red Hat OpenShift AI. To use this method, log in to the OpenShift Container Platform as a cluster administrator and follow the steps as described in [Configuring the cluster-wide proxy during installation](#).

- You can use self-signed certificates in a custom CA bundle (**odh-ca-bundle.crt**) that is separate from the cluster-wide bundle. To use this method, follow the steps in this section.

Prerequisites

- You have admin access to the **DSCInitialization** resources in the OpenShift Container Platform cluster.
- You installed the OpenShift command line interface (**oc**) as described in [Get Started with the CLI](#).
- You are working in a new installation of Red Hat OpenShift AI. If you upgraded Red Hat OpenShift AI, see [Adding a CA bundle after upgrading](#).

Procedure

1. Log in to the OpenShift Container Platform.
2. Click **Operators** → **Installed Operators** and then click the Red Hat OpenShift AI Operator.
3. Click the **DSC Initialization** tab.
4. Click the **default-dsci** object.
5. Click the **YAML** tab.
6. In the **spec** section, add the custom certificate to the **customCABundle** field for **trustedCABundle**, as shown in the following example:

```
spec:
  trustedCABundle:
    managementState: Managed
    customCABundle: |
      -----BEGIN CERTIFICATE-----
      examplebundle123
      -----END CERTIFICATE-----
```

7. Click **Save**.

Verification

- If you are using a cluster-wide CA bundle, run the following command to verify that all non-reserved namespaces contain the **odh-trusted-ca-bundle** ConfigMap:

```
$ oc get configmaps --all-namespaces -l app.kubernetes.io/part-of=opendatahub-operator |
  grep odh-trusted-ca-bundle
```

- If you are using a custom CA bundle, run the following command to verify that a non-reserved namespace contains the **odh-trusted-ca-bundle** ConfigMap and that the ConfigMap contains your **customCABundle** value. In the following command, *example-namespace* is the non-reserved namespace and *examplebundle123* is the customCABundle value.

```
$ oc get configmap odh-trusted-ca-bundle -n example-namespace -o yaml | grep
  examplebundle123
```

3.3. REMOVING A CA BUNDLE

You can remove a Certificate Authority (CA) bundle from all non-reserved namespaces in OpenShift AI. This process changes the default configuration and disables the creation of the **odh-trusted-ca-bundle** configuration file (ConfigMap), as described in *Understanding certificates in OpenShift AI*.



NOTE

The **odh-trusted-ca-bundle** ConfigMaps are only deleted from namespaces when you set the **managementState** of **trustedCABundle** to **Removed**; deleting the DSC Initialization does not delete the ConfigMaps.

To remove a CA bundle from a single namespace only, see *Removing a CA bundle from a namespace*.

Prerequisites

- You have cluster administrator privileges for your OpenShift Container Platform cluster.
- You installed the OpenShift command line interface (**oc**) as described in [Get Started with the CLI](#).

Procedure

1. In the OpenShift Container Platform web console, click **Operators** → **Installed Operators** and then click the Red Hat OpenShift AI Operator.
2. Click the **DSC Initialization** tab.
3. Click the **default-dsci** object.
4. Click the **YAML** tab.
5. In the **spec** section, change the value of the **managementState** field for **trustedCABundle** to **Removed**:

```
spec:
  trustedCABundle:
    managementState: Removed
```

6. Click **Save**.

Verification

- Run the following command to verify that the **odh-trusted-ca-bundle** ConfigMap has been removed from all namespaces:

```
$ oc get configmaps --all-namespaces | grep odh-trusted-ca-bundle
```

The command should not return any ConfigMaps.

3.4. REMOVING A CA BUNDLE FROM A NAMESPACE

You can remove a custom Certificate Authority (CA) bundle from individual namespaces in OpenShift AI. This process disables the creation of the **odh-trusted-ca-bundle** configuration file (ConfigMap) for the specified namespace only.

To remove a certificate bundle from all namespaces, see *Removing a CA bundle*.

Prerequisites

- You have cluster administrator privileges for your OpenShift Container Platform cluster.
- You installed the OpenShift command line interface (**oc**) as described in [Get Started with the CLI](#).

Procedure

- Run the following command to remove a CA bundle from a namespace. In the following command, *example-namespace* is the non-reserved namespace.

```
$ oc annotate ns example-namespace security.opendatahub.io/inject-trusted-ca-bundle=false
```

Verification

- Run the following command to verify that the CA bundle has been removed from the namespace. In the following command, *example-namespace* is the non-reserved namespace.

```
$ oc get configmap odh-trusted-ca-bundle -n example-namespace
```

The command should return **configmaps "odh-trusted-ca-bundle" not found**.

3.5. MANAGING CERTIFICATES

After installing OpenShift AI, the Red Hat OpenShift AI Operator creates the **odh-trusted-ca-bundle** configuration file (ConfigMap) that contains the trusted CA bundle and adds it to all new and existing non-reserved namespaces in the cluster. By default, the Red Hat OpenShift AI Operator manages the **odh-trusted-ca-bundle** ConfigMap and automatically updates it if any changes are made to the CA bundle. You can choose to manage the **odh-trusted-ca-bundle** ConfigMap instead of allowing the Red Hat OpenShift AI Operator to manage it.

Prerequisites

- You have cluster administrator privileges for your OpenShift Container Platform cluster.

Procedure

1. In the OpenShift Container Platform web console, click **Operators** → **Installed Operators** and then click the **Red Hat OpenShift AI Operator**.
2. Click the **DSC Initialization** tab.
3. Click the **default-dsci** object.
4. Click the **YAML** tab.

- In the **spec** section, change the value of the **managementState** field for **trustedCABundle** to **Unmanaged**, as shown:

```
spec:
  trustedCABundle:
    managementState: Unmanaged
```

- Click **Save**.

Note that changing the **managementState** from **Managed** to **Unmanaged** does not remove the **odh-trusted-ca-bundle** ConfigMap, but the ConfigMap is not updated if you make changes to the **customCABundle** field.

Verification

- In the **spec** section, set or change the value of the **customCABundle** field for **trustedCABundle**, for example:

```
spec:
  trustedCABundle:
    managementState: Unmanaged
    customCABundle: example123
```

- Click **Save**.
- Click **Workloads → ConfigMaps**.
- Select a project from the project list.
- Click the **odh-trusted-ca-bundle** ConfigMap.
- Click the **YAML** tab and verify that the value of the **customCABundle** field did not update.

3.6. USING SELF-SIGNED CERTIFICATES WITH OPENSIFT AI COMPONENTS

Some OpenShift AI components have additional options or required configuration for self-signed certificates.

3.6.1. Using certificates with data science pipelines

If you want to use self-signed certificates, you have added them to a central Certificate Authority (CA) bundle as described in [Working with certificates](#) (for disconnected environments, see [Working with certificates](#)).

No additional configuration is necessary to use those certificates with data science pipelines.

3.6.1.1. Providing a CA bundle only for data science pipelines

Perform the following steps to provide a Certificate Authority (CA) bundle just for data science pipelines.

Procedure

- Log in to OpenShift Container Platform.

- From **Workloads** → **ConfigMaps**, create a ConfigMap with the required bundle in the same data science project or namespace as the target data science pipeline:

```
kind: ConfigMap
apiVersion: v1
metadata:
  name: custom-ca-bundle
data:
  ca-bundle.crt: |
    # contents of ca-bundle.crt
```

- Add the following snippet to the **.spec.apiserver.caBundle** field of the underlying Data Science Pipelines Application (DSPA):

```
apiVersion: datasciencepipelinesapplications.opendatahub.io/v1alpha1
kind: DataSciencePipelinesApplication
metadata:
  name: data-science-pipelines-definition
spec:
  ...
  apiServer:
  ...
  caBundle:
    configMapName: custom-ca-bundle
    configMapKey: ca-bundle.crt
```

The pipeline server pod redeploys with the updated bundle and uses it in the newly created pipeline pods.

Verification

Perform the following steps to confirm that your CA bundle was successfully mounted.

- Log in to the OpenShift Container Platform console.
- Go to the OpenShift Container Platform project that corresponds to the data science project.
- Click the **Pods** tab.
- Click the pipeline server pod with the **ds-pipeline-pipelines-definition-`<hash>`** prefix.
- Click **Terminal**.
- Enter **cat /dsp-custom-certs/dsp-ca.crt**.
- Verify that your CA bundle is present within this file.

You can also confirm that your CA bundle was successfully mounted by using the CLI:

- In a terminal window, log in to the OpenShift cluster where OpenShift AI is deployed.

```
oc login
```

- Set the **dspa** value:

```
dspa=pipelines-definition
```

3. Set the **dsProject** value, replacing **\$YOUR_DS_PROJECT** with the name of your data science project:

```
dsProject=$YOUR_DS_PROJECT
```

4. Set the **pod** value:

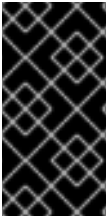
```
pod=$(oc get pod -n ${dsProject} -l app=ds-pipeline-${dspa} --no-headers | awk '{print $1}')
```

5. Display the contents of the **/dsp-custom-certs/dsp-ca.crt** file:

```
oc -n ${dsProject} exec $pod -- cat /dsp-custom-certs/dsp-ca.crt
```

6. Verify that your CA bundle is present within this file.

3.6.2. Using certificates with workbenches



IMPORTANT

Self-signed certificates apply to workbenches that you create after configuring self-signed certificates centrally as described in [Working with certificates](#) (for disconnected environments, see [Working with certificates](#)). There is no change to workbenches that you created before configuring self-signed certificates.

3.6.2.1. Creating data science pipelines with Elyra and self-signed certificates

To create pipelines using a workbench that contains the Elyra extension and which uses self-signed certificates, see the [Workbench workaround for executing a pipeline using Elyra in a disconnected environment](#) knowledgebase article.


CHAPTER 4. ACCESSING THE DASHBOARD

After you have installed OpenShift AI and added users, you can access the URL for your OpenShift AI console and share the URL with the users to let them log in and work on their models.

Prerequisites

- You have installed OpenShift AI on your OpenShift Container Platform cluster.
- You have added at least one user to the user group for OpenShift AI.

Procedure

1. Log in to OpenShift Container Platform web console.
2. Click the application launcher ().
3. Right-click on **Red Hat OpenShift AI** and copy the URL for your OpenShift AI instance.
4. Provide this instance URL to your data scientists to let them log in to OpenShift AI.

Verification

- Confirm that you and your users can log in to OpenShift AI by using the instance URL.

Additional resources

- [Logging in to OpenShift AI](#)
- [Adding users](#)

CHAPTER 5. ENABLING GPU SUPPORT IN OPENSIFT AI

Optionally, to ensure that your data scientists can use compute-heavy workloads in their models, you can enable graphics processing units (GPUs) in OpenShift AI.



IMPORTANT

If you are using OpenShift AI in a disconnected self-managed environment, see [Enabling GPU support in OpenShift AI](#) instead.

Prerequisites

- You have logged in to your OpenShift Container Platform cluster.
- You have the **cluster-admin** role in your OpenShift Container Platform cluster.

Procedure

1. To enable GPU support on an OpenShift cluster, follow the instructions here: [NVIDIA GPU Operator on Red Hat OpenShift Container Platform](#) in the NVIDIA documentation.
2. Delete the **migration-gpu-status** ConfigMap.
 - a. In the OpenShift Container Platform web console, switch to the **Administrator** perspective.
 - b. Set the **Project** to **All Projects** or **redhat-ods-applications** to ensure you can see the appropriate ConfigMap.
 - c. Search for the **migration-gpu-status** ConfigMap.
 - d. Click the action menu (**:**) and select **Delete ConfigMap** from the list. The **Delete ConfigMap** dialog appears.
 - e. Inspect the dialog and confirm that you are deleting the correct ConfigMap.
 - f. Click **Delete**.
3. Restart the dashboard replicaset.
 - a. In the OpenShift Container Platform web console, switch to the **Administrator** perspective.
 - b. Click **Workloads** → **Deployments**.
 - c. Set the **Project** to **All Projects** or **redhat-ods-applications** to ensure you can see the appropriate deployment.
 - d. Search for the **rhods-dashboard** deployment.
 - e. Click the action menu (**:**) and select **Restart Rollout** from the list.
 - f. Wait until the **Status** column indicates that all pods in the rollout have fully restarted.

Verification

- The NVIDIA GPU Operator appears on the **Operators** → **Installed Operators** page in the OpenShift Container Platform web console.

- The reset **migration-gpu-status** instance is present in the **Instances** tab on the **AcceleratorProfile** custom resource definition (CRD) details page.

After installing the NVIDIA GPU Operator, create an accelerator profile as described in [Working with accelerator profiles](#).

CHAPTER 6. UNINSTALLING RED HAT OPENSIFT AI SELF-MANAGED

This section shows how to use the OpenShift command-line interface (CLI) to uninstall the Red Hat OpenShift AI Operator and any OpenShift AI components installed and managed by the Operator.



NOTE

Using the CLI is the recommended way to uninstall the Operator. Depending on your version of OpenShift Container Platform, using the web console to perform the uninstallation might not prompt you to uninstall all associated components. This could leave you unclear about the final state of your cluster.

6.1. UNDERSTANDING THE UNINSTALLATION PROCESS

Installing Red Hat OpenShift AI created several custom resource instances on your OpenShift Container Platform cluster for various components of OpenShift AI. After installation, users likely created several additional resources while using OpenShift AI. Uninstalling OpenShift AI removes the resources that were created by the Operator, but retains the resources created by users to prevent inadvertently deleting information you might want.

What is deleted

Uninstalling OpenShift AI removes the following resources from your OpenShift Container Platform cluster:

- **DataScienceCluster** custom resource instance
- **DSCInitialization** custom resource instance
- **FeatureTracker** custom resource instances created during or after installation
- **ServiceMesh** custom resource instance created by the Operator during or after installation
- **KNativeServing** custom resource instance created by the Operator during or after installation
- **redhat-ods-applications**, **redhat-ods-monitoring**, and **rhods-notebooks** namespaces created by the Operator
- Workloads in the **rhods-notebooks** namespace
- **Subscription**, **ClusterServiceVersion**, and **InstallPlan** objects
- **KfDef** object (version 1 Operator only)

What might remain

Uninstalling OpenShift AI retains the following resources in your OpenShift Container Platform cluster:

- Data science projects created by users
- Custom resource instances created by users
- Custom resource definitions (CRDs) created by users or by the Operator

While these resources might still remain in your OpenShift Container Platform cluster, they are not

functional. After uninstalling, Red Hat recommends that you review the data science projects and custom resources in your OpenShift Container Platform cluster and delete anything no longer in use to prevent potential issues, such as pipelines that cannot run, notebooks that cannot be undeployed, or models that cannot be undeployed.

Additional resources

[Operator Lifecycle Manager \(OLM\) uninstall documentation](#)

6.2. UNINSTALLING OPENSIFT AI SELF-MANAGED BY USING THE CLI

The following procedure shows how to use the OpenShift command-line interface (CLI) to uninstall the Red Hat OpenShift AI Operator and any OpenShift AI components installed and managed by the Operator.

Prerequisites

- You have cluster administrator privileges for your OpenShift Container Platform cluster.
- You have downloaded and installed the OpenShift command-line interface (CLI). See [Installing the OpenShift CLI](#).
- You have backed up the persistent disks or volumes used by your persistent volume claims (PVCs).

Procedure

1. Open a new terminal window.
2. In the OpenShift command-line interface (CLI), log in to your OpenShift Container Platform cluster as a cluster administrator, as shown in the following example:

```
$ oc login <openshift_cluster_url> -u system:admin
```

3. Create a **ConfigMap** object for deletion of the Red Hat OpenShift AI Operator.

```
$ oc create configmap delete-self-managed-odh -n redhat-ods-operator
```

4. To delete the **rhods-operator**, set the **addon-managed-odh-delete** label to **true**.

```
$ oc label configmap/delete-self-managed-odh api.openshift.com/addon-managed-odh-delete=true -n redhat-ods-operator
```

5. When all objects associated with the Operator are removed, delete the **redhat-ods-operator** project.
 - a. Set an environment variable for the **redhat-ods-applications** project.

```
$ PROJECT_NAME=redhat-ods-applications
```

- b. Wait until the **redhat-ods-applications** project has been deleted.

```
$ while oc get project $PROJECT_NAME && /dev/null; do
```

```
echo "The $PROJECT_NAME project still exists"  
sleep 1  
done  
echo "The $PROJECT_NAME project no longer exists"
```

When the **redhat-ods-applications** project has been deleted, you see the following output.

```
The redhat-ods-applications project no longer exists
```

- c. When the **redhat-ods-applications** project has been deleted, delete the **redhat-ods-operator** project.

```
$ oc delete namespace redhat-ods-operator
```

Verification

- Confirm that the **rhods-operator** subscription no longer exists.

```
$ oc get subscriptions --all-namespaces | grep rhods-operator
```

- Confirm that the following projects no longer exist.

- **redhat-ods-applications**
- **redhat-ods-monitoring**
- **redhat-ods-operator**
- **rhods-notebooks**

```
$ oc get namespaces | grep -e redhat-ods* -e rhods*
```



NOTE

The **rhods-notebooks** project was created only if you installed the workbenches component of OpenShift AI. See [Installing and managing Red Hat OpenShift AI components](#).