



## Cost Management Service 2022

### Adding an OpenShift Container Platform source to cost management

Learn how to add and configure your OpenShift Container Platform sources



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## Abstract

This guide describes how to add an OpenShift Container Platform source to cost management.

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# CHAPTER 1. ADDING AN OPENSIFT CONTAINER PLATFORM SOURCE TO COST MANAGEMENT

## 1.1. INSTALLATION TASKS SUMMARY

Whether you are replacing a prior cost management operator with the **Cost Management Metrics Operator** or installing it for the first time, the basic tasks are the same.

Operator installation, configuration, and source management can all be performed from the OpenShift Container Platform web console.

You will perform the following tasks to install the **Cost Management Metrics Operator** and begin using the cost management application in OpenShift Container Platform.



### NOTE

To install and configure Cost Management Metrics Operator from the OpenShift Container Platform web console, you must use an account with cluster administrator privileges.

### Prerequisites

- The OpenShift Container Platform cluster is installed.
- You can access the OpenShift Container Platform web console using an account that has cluster administrator privileges.

### Task summary

- Install the Cost Management Metrics Operator (**costmanagement-metrics-operator**) and use the default token authentication.
- Create a CostManagementMetricsConfig YAML file that configures **costmanagement-metrics-operator**
- Create a cost management OpenShift Container Platform source with a new installation, or confirm an existing source with a replacement installation.
- After installing the Cost Management Metrics Operator, delete the old cost operator. This task is required only when a previous cost management operator is installed.

If you use Basic authentication, additional steps are required to configure the Secret that holds username and password credentials.

## 1.2. INSTALLING THE COST OPERATOR

Install the **Cost Management Metrics Operator** from the OpenShift Container Platform web console.

### Prerequisites

- You are logged into the OpenShift Container Platform web console with cluster administrator privileges.

### Procedure

## Procedure

1. Login to the OpenShift Container Platform web console and click on the **Operators > OperatorHub** tab.
2. Search for and locate **Cost Management Metrics Operator**.
3. Click on the displayed **Cost Management Metrics Operator** tile.
4. When the **Install Operator** window appears, you must select the **costmanagement-metrics-operator** namespace for installation. If the namespace does not yet exist, it is created for you.
5. Click on the **Install** button.
6. After a short wait, **Cost Management Metrics Operator** appears in the **Installed Operators** tab under **Project: all projects** or **Project: costmanagement-metrics-operator**.



### IMPORTANT

If a proxy with a custom CA certificate is configured, additional configuration is required to inject this certificate into Cost Management Metrics Operator. See, [Injecting a custom CA certificate](#) in the OpenShift Container Platform documentation for details.

## 1.3. CONFIGURING THE OPERATOR INSTANCE FOR A NEW INSTALLATION

Use the OpenShift Container Platform web console to configure the **costmanagement-metrics-operator** instance after it is installed.

### Prerequisites

- You are logged into the OpenShift Container Platform web console with cluster administrator privileges.
- The **Cost Management Metrics Operator** appears in the **Installed Operators** tab.

### Procedure

1. Under the **Name** heading in the list of installed operators, click the **Cost Management Metrics Operator** link. The **Installed Operators > Operator Details** window appears for **Cost Management Metrics Operator**.
2. In the **Details** window, click **+ Create Instance**.
3. A **Cost Management Metrics Operator > Create CostManagementMetricsConfig** window appears.
4. Click the **YAML view** radio button to view and modify the contents of the YAML configuration file.
5. When you create a new cost management instance for the Cost Management Metrics Operator, make the following modifications in the YAML configuration file.
6. Locate the following two lines in the YAML file.

```
create_source: false
name: INSERT-SOURCE-NAME
```

- a. Change **false** to **true**.
- b. Change **INSERT-SOURCE-NAME** to the new name of your source.

### Example

```
create_source: true
name: my-openshift-cost-source
```



### NOTE

The value entered for **INSERT-SOURCE-NAME** will be the name of the source in cost management. Leaving this value as **INSERT-SOURCE-NAME** is acceptable, but it is recommended to change it to something more identifiable, especially when installing the operator in multiple clusters.

7. Click the **Create** button. These actions create a new source for cost management that will appear in the [console.redhat.com](https://console.redhat.com) cost management application.

## 1.4. REPLACING A PRIOR OPERATOR INSTANCE

If you are replacing a prior cost management operator with the Cost Management Metrics Operator, make certain your existing cost management source is properly configured in the YAML configuration file.



### IMPORTANT

When you are replacing a prior cost management operator with the **Cost Management Metrics Operator** and you want to use an existing source, you must make certain that the **name: INSERT-SOURCE-NAME** in the YAML file matches your existing source.

### Prerequisites

- You are logged into the OpenShift Container Platform web console with cluster administrator privileges.
- You can access [console.redhat.com](https://console.redhat.com) and view existing cost management sources.

### Procedure

1. Under the **Name** heading in the list of installed operators, click the **Cost Management Metrics Operator** link. The **Installed Operators > Operator Details** window appears for **Cost Management Metrics Operator**.
2. In the **Details** window, click **+ Create Instance**.
3. A **Cost Management Metrics Operator > Create CostManagementMetricsConfig** window appears.

4. Click the **YAML view** radio button to view and modify the contents of the **CostManagementMetricsConfig** YAML file.
5. Open [console.redhat.com](https://console.redhat.com) and log in using your Organization Administrator account.
6. Click on  (Settings).
7. Click on the **Sources** tab to display existing sources.
8. Select an existing cost management source and copy its name.
9. In the CostManagementMetricsConfig YAML file, replace **INSERT-SOURCE-NAME** with the source name that you copied from the cost management source list for your organization.

```
create_source: false
name: INSERT-SOURCE-NAME <<<< replace this string
```

The **create\_source: false** does not change because you are matching an existing source, not creating a new source.

10. Click the **Create** button. No further actions are needed to configure the operator instance.

## 1.5. REMOVING A PRIOR COST OPERATOR

After installing the **costmanagement-metrics-operator**, uninstall the prior cost management operator.

To avoid gaps in your cost management data, you can wait 24 to 48 hours before removing the prior operator while you verify that **costmanagement-metrics-operator** provides cost management reports.



### NOTE

If you mistakenly remove the **Cost Management Metrics Operator**, reinstall it.

### Prerequisites

- A prior cost management operator is installed.
- You installed the **Cost Management Metrics Operator**.
- You are logged into the OpenShift Container Platform web console with cluster administrator privileges.
- You can view the operators in the **Installed Operators** tab.

### Procedure

1. In the Installed Operators list, select the operator you want to remove.
2. Click the **Options** menu  in that row.
3. Click on the **Uninstall Operator** option. Confirm the action to remove the operator.
4. In the OpenShift Container Platform web console, click the **Administration > Custom Resource Definitions** tab.

5. In the window that displays the custom resource definitions (CRD), locate the **CostManagement** CRD and the **CostManagementData** CRD for **cost-mgmt-operator** or the **KokuMetricsConfig** CRD for **koku-metrics-operator**.
6. For each CRD, click the **Options** menu  → **Delete Custom Resource Definition** Confirm the delete action.
7. When these CRDs are deleted, the prior operator is fully uninstalled.



## NOTE

When you install **Cost Management Metrics Operator**, a **CostManagementMetricsConfig** CRD appears in **Administration > Custom Resource Definitions** list.

## 1.6. VERIFYING THE COST OPERATOR

View the configuration YAML file to verify the cost management operator is functioning.

### Prerequisites

- You can access the OpenShift Container Platform web console.
- You can locate and view the **Installed Operators** tab.

### Procedure

1. Click on the **Installed Operators** tab.
2. In the list of installed operators, click on the **Cost Management Metrics Operator** entry.
3. When the metrics operator window opens, click on the **CostManagementMetricsConfig** tab to show a list of the configuration file names.
4. In the name list, click on the configuration file. In the default installation, the file name is **costmanagementmetricscfg-sample**.
5. When the Details window opens, click on the **YAML** tab. and visually check the following items.
  - a. Prometheus configuration and connection are **true**.

```
prometheus:
  last_query_start_time: '2021-01-25T20:59:06Z'
  last_query_success_time: '2021-01-25T20:59:06Z'
  prometheus_configured: true
  prometheus_connected: true
  service_address: 'https://thanos-querier.openshift-monitoring.svc:9091'
  skip_tls_verification: false
```

- a. Upload information shows the ingress path, successful upload and time, and accepted status.

```
upload:
  ingress_path: /api/ingress/v1/upload
```

```
last_successful_upload_time: '2021-01-25T20:59:35Z'  
last_upload_status: 202 Accepted  
last_upload_time: '2021-01-25T20:59:35Z'  
upload: true  
upload_cycle: 360  
upload_wait: 28  
validate_cert: true
```

## 1.7. CONFIGURING BASIC AUTHENTICATION FOR COST OPERATOR

You can configure the cost operator to use basic authentication. By default, the cost operator uses token authentication.

There are two procedures required when you configure basic authentication.

- [Creating the secret key/value pair for basic authentication](#)
- [Modifying the YAML file](#)

### 1.7.1. Creating the secret key/value pair for basic authentication

#### Prerequisites

- You are logged into the OpenShift Container Platform web console with cluster administrator privileges.
- The **Cost Management Metrics Operator** appears in the **Installed Operators** tab.
- You have a username and password for your [console.redhat.com](https://console.redhat.com) account.

#### Procedure

This procedure describes setting up basic authentication using the OpenShift Container Platform web console.

1. In the OpenShift Container Platform web console, click on the **Workloads > Secrets** tab.
2. In the **Secrets** window, select **Project:costmanagement-metrics-operator** from the dropdown.
3. Click the **Create > Key/Value Secret** selection.
4. In the **Create Key/Value Secret** window enter the following information to create a new secret that contains a username key and a password key and a value for each key.
  - a. Enter a name for your secret in the **Secret Name** field.

```
basic-auth-secret
```

- b. In the **Key** field, enter **username**.

```
username
```

- c. In the **Value** field for the key **username**, enter the actual username for your authorized [console.redhat.com](https://console.redhat.com) user account.

**Value for username key**

```
your_red_hat_username
```

- d. Click the **Add Key/Value** link to add the required password key name and value.
- e. In the **Key** field, enter **password**.

```
password
```

- f. In the **Value** field for the key **password**, enter the actual password for your authorized [console.redhat.com](https://console.redhat.com) user account.

**Value for password key**

```
your_red_hat_password
```

- g. Click the **Create** button to complete the creation of your basic authorization secret.
- h. After you click the **Create** button, you can verify the key/value details for the secret.

**NOTE**

Do *not* add the secret to the workload.

**1.7.2. Modifying the YAML file**

Modify the Cost Management Metrics Operator API YAML file to use basic authentication with a secret username and password key/value pair.

**Prerequisites**

- You are logged into the OpenShift Container Platform web console with cluster administrator privileges.
- You created a secret name for the username and password key/value pair.
- The Cost Management Metrics Operator is installed.

**Procedure**

1. Click on the **Operators > Installed Operators** tab.
2. Locate the row that contains **Cost Management Metrics Operator** and click on the **Cost Management Metrics Operator** link that is under the **Provided APIs** heading.
3. When the **CostManagementMetricsConfig** window appears, click on the configuration file listed in the **Name** column.  
The default name is **costmanagementmetricscfg-sample**.
4. When the **costmanagementmetricscfg-sample** window appears, click in the **YAML** tab to open an edit and view window.
5. Locate the following lines in the YAML view.

```
authentication:  
  type: token
```

6. Change **type: token** to **type: basic**.
7. Insert a new line for **secret\_name**. Enter the value for **secret\_name**, which is the name you previously created.

### Example

```
authentication:  
  secret_name: basic-auth-secret  
  type: basic
```

8. Click the **Save** button. A confirmation message appears.

## 1.8. CREATING AN OPENSIFT CONTAINER PLATFORM SOURCE MANUALLY

If you follow the previous steps, your OpenShift Container Platform source should be created automatically. However, there are situations, such as restricted network installations, when an OpenShift Container Platform source must be created manually on [console.redhat.com](https://console.redhat.com).

### Prerequisites

- OpenShift Container Platform cluster installed.
- Red Hat account user with Sources Administrator entitlements.
- You are logged into the OpenShift Container Platform web console.

### Procedure

1. From cost management, click  (**Settings**).
2. Click **Sources**.
3. Click **Red Hat Sources**.
4. Click **Add source** to open the dialog.
5. Enter a name for the source and click **Next**.
6. Select the **Red Hat OpenShift Container Platform** tile as the source type.
7. Select **cost management** as the application and click **Next**.
8. Copy your **Cluster Identifier** from the OpenShift Container Platform web console **Home > Overview** tab and click **Next**.
9. Review the details and click **Add** to create the source.

## 1.9. ADDING A RESTRICTED NETWORK SOURCE

You can install OpenShift Container Platform on a restricted network that does not have access to the internet.

The procedure to add an OpenShift Container Platform cluster operating on a restricted network as a cost management source is different in the following ways:

1. Operator Lifecycle Manager is configured to install and run local sources.
2. The **costmanagement-metrics-operator** is configured to store cost report CSV files locally using a persistent volume claim (PVC).
3. Cost reports stored in the PVC are downloaded to a workstation.
4. An OpenShift Container Platform source is created manually.
5. Cost reports are uploaded to [console.redhat.com](https://console.redhat.com) from your workstation.

### 1.9.1. Installing the cost management operator on a restricted network

For OpenShift Container Platform clusters that are installed on restricted networks, Operator Lifecycle Manager (OLM) by default cannot access the **costmanagement-metrics-operator** hosted remotely because those remote sources require full Internet connectivity. Therefore, OLM must be configured to install and run local sources.

#### Prerequisites

- OpenShift Container Platform cluster installed.
- Workstation with unrestricted network access.
- You are logged into the OpenShift Container Platform web console with cluster administrator privileges.

#### Procedure

1. Complete the following OpenShift Container Platform procedure to create a local mirror of the **costmanagement-metrics-operator**: [Using Operator Lifecycle Manager on restricted networks](#).



#### NOTE

The **costmanagement-metrics-operator** is found in the **redhat-operators** catalog in the **registry.redhat.io/redhat/redhat-operator-index:v4.10** index.

Red Hat recommends pruning unwanted objects from the index before pushing to the mirrored registry. Make sure you keep the **costmanagement-metrics-operator** package.

2. Log in to the OpenShift Container Platform web console and click **Operators > OperatorHub**.
3. Search for and locate **Cost Management Metrics Operator**.
4. Click the **Cost Management Metrics Operator** tile.

- When the **Install Operator** window appears, you must select the **costmanagement-metrics-operator** namespace for installation. If the namespace does not yet exist, it is created for you.
- Click **Install**.

### Verification steps

- After a short wait, **Cost Management Metrics Operator** appears in the **Installed Operators** tab under **Project: all projects** or **Project: costmanagement-metrics-operator**.

### Additional resources

- For more details on the Operator Lifecycle Manager, see [What is Operator Lifecycle Manager?](#)

## 1.9.2. Configuring Cost Operator on a restricted network

After the **costmanagement-metrics-operator** is installed, you must configure it to run on a restricted network.

### Prerequisites

- costmanagement-metrics-operator** installed.
- You are logged into the OpenShift Container Platform web console with cluster administrator privileges.

### Procedure

- From the OpenShift Container Platform web console, select **Operators > Installed Operators > costmanagement-metrics-operator > CostManagementMetricsConfig > Create Instance**
- Specify the desired storage. If not specified, the operator will create a default persistent volume claim called **costmanagement-metrics-operator-data** with **10Gi** of storage.



#### NOTE

To configure the **costmanagement-metrics-operator** to use or create a different PVC, update the **volume\_claim\_template** configuration in **YAML view**.

- Select **YAML view**.
- Specify the maximum number of reports to store using **max\_reports\_to\_store**, and time between report generation in minutes using **upload\_cycle**.

```
packaging:
  max_reports_to_store: 30
  max_size_MB: 100
```

```
upload:
  upload_cycle: 360
```



## IMPORTANT

The **costmanagement-metrics-operator** creates one report every **360 minutes** by default. Therefore, the default value of **30** reports and **360** minutes gives you **7.5 days** of reports.

Any report generated after the total number specified will replace the oldest report in storage. Make sure to download generated reports from your PVC before they are lost.

- Set **upload\_toggle** to **false**.

```
upload:
  upload_cycle: 360
  upload_toggle: false
```

- Replace the configuration in the **source** section with empty brackets.

```
source: {}
```

- Replace the configuration in the **authentication** section with empty brackets.

```
authentication: {}
```

- Click **Create**.

### Verification steps

- Select the **CostManagementMetricsConfig** you created.
- Select **YAML view**.
- Verify that a report has been created in the **packaging** section.

```
packaging:
  last_successful_packaging_time: `current date and time`
  max_reports_to_store: 30
  max_size_MB: 100
  number_of_reports_stored: 1
  packaged_files:
    - >
      /tmp/costmanagement-metrics-operator-reports/upload/YYYYMMDDTHHMMSS-cost-
      mgmt.tar.gz
```



## NOTE

**costmanagement-metrics-operator** will generate an initial report after it is configured. Generated reports will be listed under **packaged\_files**.

### 1.9.3. Downloading cost reports

If the **costmanagement-metrics-operator** is configured to run in a restricted network, copy the reports from the PVC where they are temporarily stored to a workstation with unrestricted network access for upload to [console.redhat.com](https://console.redhat.com).



## NOTE

The default configuration saves one week of reports. Therefore, download the reports locally and upload them to [console.redhat.com](https://console.redhat.com) weekly to prevent loss of metrics data.

## Prerequisites

- Workstation with unrestricted network access.
- **costmanagement-metrics-operator** reports in your PVC.

## Procedure

1. Create the following pod with **claimName** matching the PVC containing the report data:

```
kind: Pod
apiVersion: v1
metadata:
  name: volume-shell
  namespace: costmanagement-metrics-operator
spec:
  volumes:
  - name: costmanagement-metrics-operator-reports
    persistentVolumeClaim:
      claimName: costmanagement-metrics-operator-data
  containers:
  - name: volume-shell
    image: busybox
    command: ['sleep', '3600']
    volumeMounts:
    - name: costmanagement-metrics-operator-reports
      mountPath: /tmp/costmanagement-metrics-operator-reports
```

2. Use **rsync** to copy all of the files from the PVC to a local folder.

```
$ oc rsync volume-shell:/tmp/costmanagement-metrics-operator-reports/upload
local/path/to/save/folder
```

3. Confirm that the files have been copied.
4. Connect to the pod and delete the contents of the upload folder.

```
$ oc rsh volume-shell
$ rm /tmp/costmanagement-metrics-operator-reports/upload/*
```

5. (Optional) Delete the pod that was used to connect to the PVC.

```
$ oc delete -f volume-shell.yaml
```

## Additional resources

- For more information on persistent volume claims, see [Understanding persistent storage](#).

### 1.9.4. Uploading cost reports to console.redhat.com

You must manually upload locally stored cost reports from a restricted network to [console.redhat.com](https://console.redhat.com).



#### NOTE

The default configuration saves one week of reports. Therefore, download the reports locally and upload them to [console.redhat.com](https://console.redhat.com) weekly to prevent loss of metrics data.

#### Prerequisites

- **costmanagement-metrics-operator** reports downloaded locally.
- Source created on [console.redhat.com](https://console.redhat.com), see [Section 1.8, “Creating an Openshift Container Platform source manually”](#).
- Red Hat account user with Organization Administrator entitlements.
- Workstation with unrestricted network access.

#### Procedure

- Upload your reports to [console.redhat.com](https://console.redhat.com), replacing USERNAME and PASSWORD with your [console.redhat.com](https://console.redhat.com) login credentials, and FILE\_NAME with the report to upload:

```
$ curl -vvvv -F "file=@FILE_NAME.tar.gz;type=application/vnd.redhat.hccm.tar+tgz"
https://cloud.redhat.com/api/ingress/v1/upload -u USERNAME:PASS
```

#### Verification steps

1. From [console.redhat.com/openshift/cost-management/](https://console.redhat.com/openshift/cost-management/), click **OpenShift**.
2. Verify you have OpenShift usage data for your cluster on the **OpenShift details** page.

## CHAPTER 2. NEXT STEPS FOR MANAGING YOUR COSTS

After adding your OpenShift Container Platform and cloud infrastructure sources, in addition to showing cost data by source, cost management will automatically show AWS and Azure cost and usage related to running your OpenShift Container Platform clusters on their platforms.

On the cost management **Overview** page ([console.redhat.com/openshift/cost-management/](https://console.redhat.com/openshift/cost-management/)), your cost data will be sorted into **OpenShift** and **Infrastructure** tabs. From here, you can use **Perspective** to select different views of your cost data.

You can also use the left navigation menu to view the additional details of your costs by service.

### Additional resources

- [Adding an Amazon Web Services \(AWS\) source to cost management](#)
- [Adding a Google Cloud source to cost management](#)
- [Adding a Microsoft Azure source to cost management](#)

## 2.1. LIMIT ACCESS TO COST MANAGEMENT RESOURCES

After adding and configuring sources in cost management, it is a good idea to limit access to cost data and resources. For example, you may not want users to have access to all cost data, but instead only data specific to their projects or organization. Using role-based access control, you can limit the visibility of resources involved in cost management reports. For example, you may want to restrict a user's view to only AWS sources, instead of the entire environment.

For more information about limiting access see, [Limiting access to cost management resources](#).

## 2.2. CONFIGURE TAGGING FOR YOUR SOURCES

The cost management application tracks cloud and infrastructure costs using tags (called labels in OpenShift), which you can refine to filter and attribute to resources. Tags in cost management allow you to organize your resources by cost and to allocate the costs to different parts of your cloud infrastructure.



### IMPORTANT

Tags and labels can only be configured directly on a source. While you can choose what tags are activated in cost management, you cannot edit tags and labels in the cost management application.

See [Managing cost data using tagging](#) to learn more about:

- Planning your tagging strategy to organize your view of cost data.
- Understanding how cost management associates tags.
- Configuring tags and labels on your sources.

## 2.3. CONFIGURE COST MODELS TO ACCURATELY REPORT COSTS

Now that you have configured your sources to collect cost and usage data into cost management, you can configure cost models to associate prices to metrics and usage, and fine-tune the costs of running your cloud.

A cost model is a framework used to define the calculations for the costs stored in cost management, using raw costs and metrics. Costs generated by a cost model can be recorded, categorized and distributed to specific customers, business units or projects.

From the [Cost Models](#) area of cost management, you can:

- Classify your costs as infrastructure or supplementary costs.
- Capture monthly costs for OpenShift nodes and clusters.
- Apply a markup to account for additional support costs.
- Learn how to configure a cost model in [Using cost models](#).

## 2.4. USE THE COST EXPLORER TO VISUALIZE YOUR COSTS

The cost management [Cost Explorer](#) allows you to create custom graphs of time-scaled cost and usage information to better visualize and interpret your costs.

See [Visualizing your costs using Cost Explorer](#) to learn more about:

- Using Cost Explorer to identify abnormal events.
- Understanding how your cost data changes over time.
- Creating custom bar charts of your cost and usage data.
- Exporting custom cost data tables.