Red Hat CloudForms 4.1 Integration with Red Hat OpenShift Enterprise

---

Adding Red Hat OpenShift Enterprise (with Metrics Enabled) as a Container Provider

Red Hat CloudForms Documentation Team

Red Hat CloudForms 4.1 Integration with Red Hat OpenShift Enterprise

Adding Red Hat OpenShift Enterprise (with Metrics Enabled) as a Container Provider

Red Hat CloudForms Documentation Team
cloudforms-docs@redhat.com

Legal Notice

Abstract

This document provides a quick guide for integrating Red Hat OpenShift Enterprise container services (with metrics enabled) with Red Hat CloudForms. It is intended as an abridged reference for users already familiar with Red Hat CloudForms, Red Hat OpenShift Enterprise, and Red Hat Enterprise Linux.

Table of Contents

1. OVERVIEW

This guide provides a quick walkthrough on adding a Red Hat OpenShift Enterprise deployment to a Red Hat CloudForms container provider catalogue. Each procedure in this guide is covered in greater detail throughout other documents in the Red Hat CloudForms and OpenShift Enterprise product documentation; whenever appropriate, we will provide links to the corresponding sections for more detail. This deployment focuses on ensuring that CloudForms can collect metrics from the OpenShift Enterprise deployment upon integration.

This guide assumes that you have:

- Already deployed Red Hat CloudForms, and
- Already deployed OpenShift Enterprise.

For detailed information on how to deploy either product, see:

- Red Hat CloudForms Installation and Configuration
- OpenShift Enterprise Installation and Configuration

Note

When enabling metrics on OpenShift Enterprise, you can store your metrics data on *persistent* or *non-persistent* storage. With persistent storage, you need to provision a persistent volume specifically for this purpose. See Persistent Volumes from OpenShift Enterprise Architecture for more information.

The following sections will describe the required configuration for both products prior to integration (Section 5, “Adding the OpenShift Deployment as a Container Provider”).

2. CONFIGURING OPENSHIFT ENTERPRISE METRICS

In order for CloudForms to collect node, pod, and container metrics on your OpenShift Enterprise, you must first enable *cluster metrics* on your OpenShift deployment. This involves running the OpenShift Metrics services inside your cluster. If cluster metrics are already enabled on OpenShift, skip this section and proceed to Section 3, “Retrieving the OpenShift Enterprise Management Token”.

Note

This section is an abridged version of a more detailed chapter, namely Enabling Cluster Metrics from OpenShift Enterprise Installation and Configuration. Refer to that chapter for more information.

2.1. Configuring Required Service Accounts

Cluster metrics requires the following service accounts:

1. **metrics-deployer**

2. **heapster**

Important

If you deployed OpenShift using **`openshift-ansible-3.0.20`**, then the service account and roles required for enabling metrics will already be installed. You can skip this section and go to Section 2.2, “Choosing a Storage Option”.

To create these accounts:

1. Log in as an administrator to any node within the OpenShift Enterprise cluster.
2. Open a terminal.
3. Switch to the **openshift-infra** project:

```
$ oc project openshift-infra
```

4. Create a service account for the Metrics Deployer (namely, **metrics-deployer**):

```
$ oc create -f - <<API
  apiVersion: v1
  kind: ServiceAccount
  metadata:
    name: metrics-deployer
  secrets:
  - name: metrics-deployer
  API
```

5. Configure the **metrics-deployer** account to have **edit** permissions to the **openshift-infra** project:

```
$ oadm policy add-role-to-user \
    edit system:serviceaccount:openshift-infra:metrics-deployer
```

   The **metrics-deployer** account will be used by the Metrics Deployer, which is described in Section 2.2, “Choosing a Storage Option”.

6. The **heapster** account will be automatically created later on in Section 2.3, “Deploying the Metrics Components”. However, you should pre-emptively grant it **cluster-reader** permission to the **openshift-infra** project:

```
$ oadm policy add-cluster-role-to-user \
    cluster-reader system:serviceaccount:openshift-infra:heapster
```

2.2. Choosing a Storage Option

The *Metrics Deployer* installs and configures the components required for OpenShift Enterprise metrics. By default, the Metrics Deployer uses *self-signed certificates* to secure communication between components. This document assumes that you will use this default; for information on alternative secure communication setups, see Using Secrets from OpenShift Enterprise Installation and Configuration.

Before deploying OpenShift metrics, choose a storage option:

Persistent storage

With *persistent storage*, OpenShift metrics will be stored on a persistent volume. This offers protection to metrics data by allowing it to survive a pod recreation or restart. OpenShift metrics requires a specifically configured persistent volume; see Persistent Volumes from OpenShift Enterprise Architecture.

Non-persistent storage

With *non-persistent storage*, you no longer need to provision and configure a volume to store metric data. This makes the deployment easier; however, this option does not offer the same protection as persistent storage.

See Metrics Data Storage from OpenShift Enterprise Installation and Configuration for more information.

2.3. Deploying the Metrics Components

OpenShift Enterprise uses *Hawkular Metrics* as its metrics engine. The Metrics Deployer will install the Hawkular Metrics service; however, you need to provide an external hostname at which CloudForms can reach the Hawkular Metrics service. The base configuration of the Metrics Deployer are defined in **`/usr/share/openshift/examples/infrastructure-templates/enterprise/metrics-deployer.yaml`**.

After choosing a storage option, log in as an administrator to any node within the OpenShift Enterprise cluster. From there, open a terminal and run the corresponding command:

Deploying with persistent storage

```
$ oc new-app \
    -f /usr/share/openshift/examples/infrastructure-
templates/enterprise/metrics-deployer.yaml \
    -p HAWKULAR_METRICS_HOSTNAME=HAWKULARHOST
```

Deploying with non-persistent storage

```
$ oc new-app \
    -f /usr/share/openshift/examples/infrastructure-
templates/enterprise/metrics-deployer.yaml \
    -p HAWKULAR_METRICS_HOSTNAME=HAWKULARHOST \
    -p USE_PERSISTENT_STORAGE=false
```

For either command, replace *HAWKULARHOST* with the external hostname that CloudForms will use to reach the Hawkular Metrics service. *HAWKULARHOST* must be a fully-qualified domain name.

Either of these commands will deploy the required metrics components and create the necessary service accounts. In particular, the metrics components will be configured to also use the specified *HAWKULARHOST* as its public endpoint.

2.4. Applying the Hawkular Metrics Settings to OpenShift Enterprise

After deploying the metrics components, configure OpenShift Enterprise to use them. To do so:

1. Open the OpenShift Master Configuration file — namely, **`/etc/origin/master/master-config.yaml`**. For more information on this file, see Master Configuration Files from the OpenShift Container Platform Installation and Configuration.

2. Add a **metricsPublicURL** parameter to the **assetConfig** section. Specify the *HAWKULARHOST* you specified in Section 2.3, “Deploying the Metrics Components”:

```
assetConfig:
    ...
    metricsPublicURL: "https://HAWKULARHOST/hawkular/metrics"
```

3. Restart your OpenShift Enterprise deployment:

```
$ sudo systemctl restart atomic-openshift-master
```

3. RETRIEVING THE OPENSHIFT ENTERPRISE MANAGEMENT TOKEN

After enabling cluster metrics on your OpenShift Enterprise deployment, retrieve the *management token* while you are still logged into the OpenShift Enterprise host. This will be required later in Section 5, “Adding the OpenShift Deployment as a Container Provider”.

Refer to the procedure appropriate for your version of OpenShift Enterprise:

OpenShift Enterprise 3.2

Open a terminal and run the following command:

```
# oc sa get-token -n management-infra management-admin
eyJhbGciOiJSUzI1NiI...
```

This command provides the token needed to add an OpenShift Enterprise provider.

OpenShift Enterprise 3.1

Open a terminal and perform the following:

1. To obtain the **`management`** service account token name, run the following command::

```
# oc describe sa -n management-infra management-admin
...
Tokens:  management-admin-token-0f3fh
         management-admin-token-q7a87
```

2. Select one of the tokens and run the following command to retrieve the full token output:

```
# oc describe secret -n management-infra management-admin-token-0f3fh
...
Data
====
token:  eyJhbGciOiJSUzI1NiI...
```

   Replace **`management-admin-token-0f3fh`** with the name of your token.

This command provides the token needed to add an OpenShift Enterprise provider.

4. CONFIGURING RED HAT CLOUDFORMS

Configuring CloudForms involves two steps:

1. Section 4.1, “Configuring CloudForms Capacity and Utilization”, and
2. Section 4.2, “Enabling SmartState Analysis”

These steps are required to allow CloudForms to collect metrics from OpenShift Enterprise (Section 2, “Configuring OpenShift Enterprise Metrics”) and use them to perform a SmartState analysis. You can choose different servers to perform either function; the following sections assume that you will.

4.1. Configuring CloudForms Capacity and Utilization

For metrics collection to work properly, you also need to configure Red Hat CloudForms to allow for all three **Capacity & Utilization** server roles, which are available under **Configure → Configuration → Server → Server Control**. For more information on capacity and utilization collection, see Assigning the Capacity and Utilization Server Roles in the *Deployment Planning Guide*.

To enable these server roles:

1. Navigate to **Settings → Configuration**, and select the server to configure from **Settings → Zone** in the left pane of the appliance.
2. Navigate to the **Server Roles** list in the **Server → Server Control** section. From there, set the appropriate Capacity and Utilization roles to **ON**. Namely:
    a. **Capacity & Utilization Coordinator**
    b. **Capacity & Utilization Data Collector**
    c. **Capacity & Utilization Data Processor**
3. Click **Save**.

Data collection is enabled immediately. However, the first collection begins 5 minutes after the server is started, and every 10 minutes after that. Therefore, the longest the collection takes after enabling the Capacity & Utilization collector server role is 10 minutes. The first collection from a particular provider may take a few minutes since Red Hat CloudForms is gathering data points going one month back in time.

For more information, see Capacity and Utilization Collection from the *Deployment Planning Guide*.

4.2. Enabling SmartState Analysis

After enabling the required server roles, enable SmartState analysis. See Smart State Analysis Support (from Support Matrix) and Running a SmartState Analysis (from Managing Providers) for more information.

Enabling SmartState analysis is similar to Section 4.1, “Configuring CloudForms Capacity and Utilization”, in that the procedure also involves enabling server roles on a specific server. To do so:

1. Navigate to **Settings → Configuration**, and select the server to configure from **Settings → Zone** in the left pane of the appliance.

2. Navigate to the **Server Roles** list in the **Server → Server Control** section. From there, set the appropriate SmartState roles to **ON**. Namely:

    a. **SmartProxy**

    b. **SmartState Analysis**

3. Click **Save**.

5. ADDING THE OPENSHIFT DEPLOYMENT AS A CONTAINER PROVIDER

At this point, you should now be ready to add the OpenShift Deployment to Red Hat CloudForms as a container provider. To do so, prepare the token you retrieved earlier in Section 3, “Retrieving the OpenShift Enterprise Management Token” and follow the procedure below:

1. Navigate to **Compute → Containers → Providers**.
2. Click  (**Configuration**), then click  (**Add a New Containers Provider**).
3. Enter a **Name** for the provider.
4. From the **Type** list, select **OpenShift Enterprise**.
5. Enter the appropriate **Zone** for the provider. By default, the zone is set to **`default`**.
6. In the **Default** tab of the **Endpoints** section, enter the fully qualified domain name of the provider in the **Hostname (or IPv4 or IPv6 address)** field.
7. Enter the **Port** of the provider. The default port is **8443**.
8. In the **Token** and **Confirm Token** fields, enter token obtained earlier in Section 3, “Retrieving the OpenShift Enterprise Management Token”.
9. Click **Validate** to confirm that the Red Hat CloudForms can connect to the OpenShift Enterprise provider using the provided token.
10. Next, click the **Hawkular** tab. From there, enter the *HAWKULARHOST* (from Section 2.3, “Deploying the Metrics Components”) in the **Hostname (or IPv4 or IPv6 address)** field.
11. Enter the **Port** of the *HAWKULARHOST*. The default port is **443**.
12. Click **Add**.