Red Hat OpenShift Container Storage 4.5

Preparing to deploy in a disconnected environment

Prerequisite configuration for disconnected deployments

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Legal Notice

Abstract

Read this document for instructions on preparing a disconnected environment to install Red Hat OpenShift Container Storage 4.5.

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PREFACE

When your Red Hat OpenShift Container Storage environment is not directly connected to the internet, some additional configuration is required to provide the Operator Lifecycle Manager (OLM) with alternatives to the default Operator Hub and image registries.

See the OpenShift Container Platform documentation for more general information: Using Operator Lifecycle Manager on restricted networks.

To configure your cluster for disconnected operation:

1. Configure authentication for an alternative registry.
2. Build and mirror the Red Hat operator catalog .
3. Creating Operator imageContentSourcePolicy
4. Creating a CatalogSource from a mirrored catalog

When these steps are complete, continue with deployment as usual.

CHAPTER 1. ADDING MIRROR REGISTRY AUTHENTICATION DETAILS

Prerequisites

- Verify that your existing disconnected cluster uses OpenShift Container Platform 4.3 or higher.
- Verify that you have an **oc client** version of 4.4 or higher.
- Prepare a mirror host with a mirror registry. See Preparing your mirror host for details.

Procedure

1. Log in to the OpenShift Container Platform cluster using the **cluster-admin** role.
2. Locate your **auth.json** file.
   This file is generated when you use podman or docker to log in to a registry. It is located in one of the following locations:
   - **~/.docker/auth.json**
   - **/run/user/<UID>/containers/auth.json**
   - **/var/run/containers/<UID>/auth.json**
3. Obtain your unique Red Hat registry pull secret and paste it into your **auth.json** file. It will look something like this.

```
{
   "auths": {
      "cloud.openshift.com": {
         "auth": "*****************",
         "email": "user@example.com"
      },
      "quay.io": {
         "auth": "*****************",
         "email": "user@example.com"
      },
      "registry.connect.redhat.com": {
         "auth": "*****************",
         "email": "user@example.com"
      },
      "registry.redhat.io": {
         "auth": "*****************",
         "email": "user@example.com"
      }
   }
}
```

4. Export environment variables with the appropriate details for your setup.

```
$ export AUTH_FILE="<location_of_auth.json>"
$ export MIRROR_REGISTRY_DNS="<your_registry_url>:<port>"
```

5. Use **podman** to log in to the mirror registry and store the credentials in the **${AUTH_FILE}**.

```
$ podman login ${MIRROR_REGISTRY_DNS} --tls-verify=false --authfile ${AUTH_FILE}
```

This adds the mirror registry to the **auth.json** file.

```
{
   "auths": {
      "cloud.openshift.com": {
         "auth": "**********",
         "email": "user@example.com"
      },
      "quay.io": {
         "auth": "**********",
         "email": "user@example.com"
      },
      "registry.connect.redhat.com": {
         "auth": "**********",
         "email": "user@example.com"
      },
      "registry.redhat.io": {
         "auth": "**********",
         "email": "user@example.com"
      },
      "<mirror_registry>": {
         "auth": "**********",
      }
   }
}
```

CHAPTER 2. BUILDING AND MIRRORING THE RED HAT OPERATOR CATALOG

Follow this process on a host that has access to Red Hat registries to create a mirror of those registries.

Prerequisites

- Run these commands as a cluster administrator.
- Be aware that mirroring the **redhat-operator** catalog can take hours to complete, and requires substantial available disk space on the mirror host.

Procedure

1. Build the catalog for **redhat-operators**.
   Match the tag of the **ose-operator-registry** in the **--from** flag to the major and minor versions of the OpenShift Container Platform cluster (for example, 4.5).

   ```
   $ oc adm catalog build --appregistry-org redhat-operators \
     --from=registry.redhat.io/openshift4/ose-operator-registry:v4.5 \
     --to=${MIRROR_REGISTRY_DNS}/olm/redhat-operators:v1 \
     --registry-config=${AUTH_FILE} \
     --filter-by-os="linux/amd64" --insecure
   ```

2. Mirror the catalog for **redhat-operators**.
   This is a long operation and can take 1-5 hours. Make sure there is 100 GB available disk space on the mirror host.

   ```
   $ oc adm catalog mirror ${MIRROR_REGISTRY_DNS}/olm/redhat-operators:v1 \
   ${MIRROR_REGISTRY_DNS} --registry-config=${AUTH_FILE} --insecure
   ```

3. Disable the default **OperatorSources** by adding **disableAllDefaultSources: true** to the **spec** file for the Operator Hub.

   ```
   $ oc patch OperatorHub cluster --type json -p '[{"op": "add", "path":
   "/spec/disableAllDefaultSources", "value": true}]'
   ```

CHAPTER 3. CREATING OPERATOR IMAGECONTENTSOURCEPOLICY

After the **oc adm catalog mirror** command is completed, the **imageContentSourcePolicy.yaml** file gets created. The output directory for this file is usually, **./[catalog image name]-manifests)**. Use this procedure to add any missing entries to the **.yaml** file and apply them to cluster.

Procedure

1. Check the content of this file for the mirrors mapping shown as follows:

```
spec:
  repositoryDigestMirrors:
    - mirrors:
      - <your_registry>/ocs4
      source: registry.redhat.io/ocs4
    - mirrors:
      - <your_registry>/rhceph
      source: registry.redhat.io/rhceph
    - mirrors:
      - <your_registry>/openshift4
      source: registry.redhat.io/openshift4
    - mirrors:
      - <your_registry>/rhscl
      source: registry.redhat.io/rhscl
```

2. Add any missing entries to the end of the **imageContentSourcePolicy.yaml** file.

3. Apply the imageContentSourcePolicy.yaml file to the cluster.

```
$ oc apply -f ./[output dir]/imageContentSourcePolicy.yaml
```

Once the Image Content Source Policy is updated, all the nodes (master, infra, and workers) in the cluster need to be updated and rebooted. This process is automatically handled through the Machine Config Pool operator and take up to 30 minutes although the exact elapsed time might vary based on the number of nodes in your OpenShift cluster. You can monitor the update process by using the **oc get mcp** command or the **oc get node** command.

CHAPTER 4. CREATING A CATALOGSOURCE FROM A MIRRORED CATALOG

Procedure

1. Create a **CatalogSource** object that references the catalog image for **redhat-operators**. Save the following in a **redhat-operator-catalogsource.yaml** file, remembering to replace **<your_registry>** with your mirror registry URL:

```
apiVersion: operators.coreos.com/v1alpha1
kind: CatalogSource
metadata:
  name: redhat-operators
  namespace: openshift-marketplace
spec:
  sourceType: grpc
  icon:
    base64data:
PHN2ZyBpZD0iTGF5ZXJfMSIgZGF0YS1uYW1lPSJMYXllciAxIiB4bWxucz0iaHR0cDovL3d3dy
53My5vcmcvMjAwMC9zdmciIHZpZXdCb3g9IjAgMCAxOTIgMTQ1Ij48ZGVmcz48c3R5bGU+L
mNscy0xe2ZpbGw6I2UwMDt9PC9zdHlsZT48L2RlZnM+PHRpdGxlPlJlZEhhdC1Mb2dvLUhhd
C1Db2xvcjwvdGl0bGU+PHBhdGggZD0iTTE1Ny43Nyw2Mi42MWExNCwxNCwwLDAsMSwuM
zEsMy40MmMwLDE0Ljg4LTE4LjEsMTcuNDYtMzAuNjEsMTcuNDZDNzguODMsODMuNDksN
DIuNTMsNTMuMjYsNDIuNTMsNDRhNi40Myw2LjQzLDAsMCwxLC4yMi0xLjk0bC0zLjY2LDku
MDZhMTguNDUsMTguNDUsMCwwLDAtMS41MSw3LjMzYzAsMTguMTEsNDEsNDUuNDgs
ODcuNzQsNDUuNDgsMjAuNjksMCwzNi40My03Ljc2LDM2LjQzLTIxLjc3LDAtMS4wOCwwLTE
uOTQtMS43My0xMC4xM1oiLz48cGF0aCBjbGFzcz0iY2xzLTEiIGQ9Ik0xMjcuNDcsODMuNDlj
MTIuNTEsMCwzMC42MS0yLjU4LDMwLjYxLTE3LjQ2YTE0LDE0LDAsMCwwLS4zMS0zLjQyb
C03LjQ1LTMyLjM2Yy0xLjcyLTcuMTItMy4yMy0xMC4zNS0xNS43My0xNi42QzEyNC44OSw4Lj
Y5LDEwMy43Ni41LDk3LjUxLjVjLTUuODIsMC03LjU0LDcuNDUtMTQuNDQsNy40NS02LjY4LDAtMS42N
C01LjYtMTcuODktNS42LTYsMC05LjkxLDQuMDktMTIuOTMsMTIuNSwwLDAtOC40MSwyMy
43Mi05LjQ5LDI3LjE2QTYuNDMsNi40MywwLDAsMCw0Mi41Myw0NGMwLDkuMjIsMzYuMywz
OS40NSw4NC45NCwzOS40NU0xNjAsNzIuMDdjMS43Myw4LjE5LDEuNzMsOS4wNSwxLjczLjczL
DEwLjEzLDAsMTQtMTUuNzQsMjEuNzctMzYuNDMsMjEuNzdDNzguNTQsMTA0LDM3LjU4L
Dc2LjYsMzcuNTgsNTguNDlhMTguNDUsMTguNDUsMCwwLDEsMS41MS03LjMzQzIyLjI3LDU
yLC41LDU1LC41LDc0LjIyYzAsMzEuNDgsNzQuNTksNzAuMjgsMTMzLjY1LDcwLjI4LDQ1LjI4L
DAsNTYuNy0yMC40OCw1Ni43LTM2LjY1LDAtMTIuNzItMTEtMjcuMTYtMzAuODMtMzUuNzgi
Lz48L3N2Zz4=
    mediatype: image/svg+xml
  image: <your_registry>/olm/redhat-operators:v1
  displayName: Redhat Operators Catalog
  publisher: Red Hat
```

2. Create a **catalogsource** using the **redhat-operator-catalogsource.yaml** file:

```
$ oc apply -f redhat-operator-catalogsource.yaml
```

Verification

- Run the following command to verify that **catalogsource** and pod were created correctly.

```
$ oc get catalogsource,pod -n openshift-marketplace | grep redhat-operators
```

CHAPTER 5. CONTINUE TO DEPLOYMENT

After your alternative catalog source is configured, you can continue to the appropriate deployment process:

- Deploying OpenShift Container Storage using Amazon Web Services
- Deploying OpenShift Container Storage using VMware
- Deploying OpenShift Container Storage using bare metal infrastructure
- Deploying OpenShift Container Storage in external mode