



## Features

### NetApp Solutions

NetApp  
March 09, 2022

This PDF was generated from [https://docs.netapp.com/us-en/netapp-solutions/containers/rh-os-n\\_use\\_case\\_advanced\\_cluster\\_management\\_features\\_cluster\\_lcm.html](https://docs.netapp.com/us-en/netapp-solutions/containers/rh-os-n_use_case_advanced_cluster_management_features_cluster_lcm.html) on March 09, 2022. Always check docs.netapp.com for the latest.

# Table of Contents

- Features ..... 1
  - Features: Advanced Cluster Management for Kubernetes on Red Hat OpenShift with NetApp ..... 1
  - Features: Advanced Cluster Management for Kubernetes on Red Hat OpenShift with NetApp ..... 3
  - Features: Advanced Cluster Management for Kubernetes on Red Hat OpenShift with NetApp ..... 5
  - Features: Advanced Cluster Management for Kubernetes on Red Hat OpenShift with NetApp ..... 7
  - Features: Advanced Cluster Management for Kubernetes on Red Hat OpenShift with NetApp ..... 9

# Features

## Features: Advanced Cluster Management for Kubernetes on Red Hat OpenShift with NetApp

### Cluster Lifecycle Management

To manage different OpenShift clusters, you can either create or import them into Advanced Cluster Management.

1. First navigate to Automate Infrastructures > Clusters.
2. To create a new OpenShift cluster, complete the following steps:
  - a. Create a provider connection: Navigate to Provider Connections and click Add a Connection, provide all the details corresponding to the selected provider type and click Add.

Select a provider and enter basic information

Provider \* ⓘ

 Amazon Web Services

Connection name \* ⓘ

nik-hcl-aws

Namespace \* ⓘ

default

Configure your provider connection

Base DNS domain ⓘ

cie.netapp.com

AWS access key ID \* ⓘ

AKIATCFBZDOIASDSA

AWS secret access key \* ⓘ

.....

Red Hat OpenShift pull secret \* ⓘ

```
FuS3pNbktVaHplNFc2MkZsbmtBVGN6TktmUIZXcHcxOW9teEZwQ0lYIzId3cjJobGxJeDBQNOxIzE0yeGM5Q0ZwZk5RR2JUanlxNnNUM2IRb0FJb
UFjNCIBYlpEWWZEOHItNkxTMDZPUVpoWFRhcGwtRElDQ2RSYlJRaTlxblDLT2oyQ3pVeUJfNllwcENSa2YyOU5yLWZGSFVfNA==", "email": "Nikhil.k
ulkarni@netapp.com"}, "registry.redhat.io":
```

SSH private key \* ⓘ

```
-----BEGIN OPENSSH PRIVATE KEY-----
b3BlbnNzaC1rZXktdjEAAAABG5vbmUAAAABasdadssadm9uZQAAAAAAAAABAAAAAMwAAAAAtzc2gtZW
QyNTUxOQAAACCLcwLgAvSIHAeP+DevIRNzaG2zkNreMIZ/UHyfOUWwAAAAAJhy/wa6xf8Gu
```

SSH public key \* ⓘ

```
ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIltzAuAC746agdh2lcB4/4N6/VE3NobbOQ2t4zVn9QfJ/RRa8A root@nik-rhel8
```

- b. To create a new cluster, navigate to Clusters and click Add a Cluster > Create a Cluster. Provide the details for the cluster and the corresponding provider and click Create.

The screenshot shows the 'Configuration' section of the Red Hat OpenShift cluster creation interface. It includes a 'Cluster name' field with the value 'rh-aws'. Below this is the 'Distribution' section, which prompts the user to 'Select the type of Kubernetes distribution to use for your cluster.' The 'Red Hat OpenShift' option is selected, indicated by a blue checkmark. Underneath, it asks to 'Select an infrastructure provider to host your Red Hat OpenShift cluster.' The 'Amazon Web Services' provider is selected. Other available providers include Google Cloud, Microsoft Azure, VMware vSphere, Bare Metal, and Metal. The 'Release image' field contains the URL 'quay.io/openshift-release-dev/ocp-release:4.7.12-x86\_64'. The 'Provider connection' field contains the name 'nik-hcl-aws'. At the bottom right, there is a link to 'Add a connection'.

Configuration

Cluster name \* ⓘ

rh-aws

Distribution

Select the type of Kubernetes distribution to use for your cluster.

Red Hat OpenShift

Select an infrastructure provider to host your Red Hat OpenShift cluster.

aws Amazon Web Services

Google Cloud

Microsoft Azure

VMware vSphere

Bare Metal

Release image \* ⓘ

quay.io/openshift-release-dev/ocp-release:4.7.12-x86\_64

Provider connection \* ⓘ

nik-hcl-aws

[Add a connection](#)

- c. After the cluster is created, it appears in the cluster list with the status Ready.
3. To import an existing cluster, complete the following steps:
- Navigate to Clusters and click Add a Cluster > Import an Existing Cluster.
  - Enter the name of the cluster and click Save Import and Generate Code. A command to add the existing cluster is displayed.
  - Click Copy Command and run the command on the cluster to be added to the hub cluster. This initiates the installation of the necessary agents on the cluster, and, after this process is complete, the cluster appears in the cluster list with status Ready.

**Name \***

ocp-vmw1

**Additional labels**

Once you click on "Save import and generate code", the information you entered will be used to generate the code and cannot be modified anymore. If you wish to change any information, you will have to delete and re-import this cluster.

Code generated successfully Import saved

**Run a command**

**1. Copy this command**

Click the button to have the command automatically copied to your clipboard.

Copy command

**2. Run this command with kubectl configured for your targeted cluster to start the import**

Log in to the existing cluster in your terminal and run the command.

View cluster Import another

4. After you create and import multiple clusters, you can monitor and manage them from a single console.

[Next: Features - Application Lifecycle Management.](#)

## Features: Advanced Cluster Management for Kubernetes on Red Hat OpenShift with NetApp

### Application lifecycle management

To create an application and manage it across a set of clusters,

1. Navigate to Manage Applications from the sidebar and click Create Application. Provide the details of the application you would like to create and click Save.

Create an application YAML: Off

Cancel

Save

**Name\*** ⓘ  
demo-app

**Namespace\*** ⓘ  
default

^ **Repository location for resources**

^ **Repository types**

Select the type of repository where resources that you want to deploy are located

 Git ☒

**URL\*** ⓘ  
https://github.com/open-cluster-management/acm-hive-openshift-releases.git

**Branch** ⓘ  
main

**Path** ⓘ  
clusterImageSets/fast/4.7

- After the application components are installed, the application appears in the list.

## Applications

Refresh every 15s

Last update: 7:36:23 PM

Overview

Advanced configuration

Create application

| Q Search   |           |          |          |             |            |  |
|------------|-----------|----------|----------|-------------|------------|--|
| Name       | Namespace | Clusters | Resource | Time window | Created    |  |
| demo-app   | default   | Local    | Git      |             | 8 days ago |  |
| 1 - 1 of 1 |           |          |          |             |            |  |

- The application can now be monitored and managed from the console.

# Features: Advanced Cluster Management for Kubernetes on Red Hat OpenShift with NetApp

## Governance and risk

This feature allows you to define the compliance policies for different clusters and make sure that the clusters adhere to it. You can configure the policies to either inform or remediate any deviations or violations of the rules.

1. Navigate to Governance and Risk from the sidebar.
2. To create compliance policies, click Create Policy, enter the details of the policy standards, and select the clusters that should adhere to this policy. If you want to automatically remediate the violations of this policy, select the checkbox Enforce if Supported and click Create.


# Create policy YAML: Off

**Name \***

policy-complianceoperator

**Namespace \*** 

default

**Specifications \***  ComplianceOperator**Cluster selector**  local-cluster: "true"**Standards**  NIST-CSF**Categories**  PR.IP Information Protection Processes and Procedures**Controls**  PR.IP-1 Baseline Configuration☐ **Enforce if supported** ☐ **Disable policy** 

3. After all the required policies are configured, any policy or cluster violations can be monitored and remediated from Advanced Cluster Management.



Summary 1

Standards ▼

## NIST-CSF



No violations found

Based on the industry standards, there are no cluster or policy violations.

Policies

Cluster violations

Find policies

| Policy name ↑             | Namespace ↑ | Remediation ↑ | Cluster violations ↑ | Standards ↑ | Categories ↑  | Controls ↑                     | Created ↓        |
|---------------------------|-------------|---------------|----------------------|-------------|---|--------------------------------|------------------|
| policy-complianceoperator | default     | inform        | ✓ 0/1                | NIST-CSF    | PR.IP Information Protection Processes and Procedures | PR.IP-1 Baseline Configuration | 32 minutes ago ⋮ |

1 - 1 of 1 ▼ << < 1 of 1 > >>

[Next: Features - Observability.](#)

## Features: Advanced Cluster Management for Kubernetes on Red Hat OpenShift with NetApp

### Observability

Advanced Cluster Management for Kubernetes provides a way to monitor the nodes, pods, and applications, and workloads across all the clusters.

1. Navigate to Observe Environments > Overview.



2. All pods and workloads across all clusters are monitored and sorted based on a variety of filters. Click Pods to view the corresponding data.



3. All nodes across the clusters are monitored and analyzed based on a variety of data points. Click Nodes to get more insight into the corresponding details.

## Search

Saved searches [Open new search tab](#)

3 Related cluster

1k Related pod

12 Related service

Show all (3)

### Node (20)

| Name                                       | Cluster        | Role              | Architecture | OS image   | CPU | Created     | Labels   |
|--|----------------|-------------------|--------------|--|-----|-------------|--|
| ocp-master-1.ocp-bare-metal.cie.netapp.com | ocp-bare-metal | master;<br>worker | amd64        | Red Hat Enterprise Linux CoreOS 47.83.202103292105-0 (Ootpa) | 48  | a month ago | beta.kubernetes.io/arch=amd64 beta.kubernetes.io/os=linux<br>kubernetes.io/arch=amd64 5 more |
| ocp-master-2.ocp-bare-metal.cie.netapp.com | ocp-bare-metal | master;<br>worker | amd64        | Red Hat Enterprise Linux CoreOS 47.83.202103292105-0 (Ootpa) | 48  | a month ago | beta.kubernetes.io/arch=amd64 beta.kubernetes.io/os=linux<br>kubernetes.io/arch=amd64 5 more |
| ocp-master-3.ocp-bare-metal.cie.netapp.com | ocp-bare-metal | master;<br>worker | amd64        | Red Hat Enterprise Linux CoreOS 47.83.202103292105-0 (Ootpa) | 48  | a month ago | beta.kubernetes.io/arch=amd64 beta.kubernetes.io/os=linux<br>kubernetes.io/arch=amd64 5 more |

4. All clusters are monitored and organized based on different cluster resources and parameters. Click Clusters to view cluster details.

## Search

Saved searches [Open new search tab](#)

3k Related secret

787 Related pod

15 Related persistentvolumeclaim

17 Related node

1 Related application

15 Related persistentvolume

1 Related searchcollector

8 Related clusterclaim

3 Related resourcequota

5 Related identity

Show all (159)

### Cluster (2)

| Name          | Available | Hub accepted | Joined | Nodes | Kubernetes version | CPU | Memory   | Console URL            | Labels   |
|---------------|-----------|--------------|--------|-------|--------------------|-----|----------|------------------------|--|
| local-cluster | True      | True         | True   | 8     | v1.20.0+c8905da    | 84  | 418501Mi | <a href="#">Launch</a> | cloud=VSphere clusterID=148632d9-69d5-4ae4-98ee-8df886463c3<br>installer.name=multiclusterhub 4 more |
| ocp-vmw       | True      | True         | True   | 9     | v1.20.0+df9c838    | 28  | 111981Mi | <a href="#">Launch</a> | cloud=VSphere clusterID=9d76ac4e-4aae-4d45-a2e8-11b6b54282fe name=ocp-vmw 1 more                     |

Next: Features - Create Resources.

# Features: Advanced Cluster Management for Kubernetes on Red Hat OpenShift with NetApp

## Create resources on multiple clusters

Advanced Cluster Management for Kubernetes allows users to create resources on one or more managed clusters simultaneously from the console. As an example, if you have OpenShift clusters at different sites backed with different NetApp ONTAP clusters and want to provision PVC's at both sites, you can click the (+) sign on the top bar. Then select the clusters on which you want to create the PVC, paste the resource YAML, and click Create.

# Create resource

[Cancel](#)[Create](#)

Clusters | Select the clusters where the resource(s) will be deployed.

2 x local-cluster,  
ocp-vmw

Resource configuration | Enter the configuration manifest for the resource(s).

YAML

```
1 kind: PersistentVolumeClaim
2 apiVersion: v1
3 metadata:
4   name: demo-pvc
5 spec:
6   accessModes:
7     - ReadWriteOnce
8   resources:
9     requests:
10      storage: 1Gi
11   storageClassName: ocp-trident
```

## Copyright Information

Copyright © 2022 NetApp, Inc. All rights reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means-graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system-without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

RESTRICTED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.277-7103 (October 1988) and FAR 52-227-19 (June 1987).

## Trademark Information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.