Enable Kubernetes clusters on NetApp HCI

HCI

NetApp
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Enable Kubernetes clusters on NetApp HCI

Manage Kubernetes clusters on NetApp HCI overview

Using the NetApp Kubernetes Service (NKS) on Cloud Central, you can create and manage Kubernetes clusters anywhere using a single interface, whether you need them to reside on a private cloud or many public clouds.

Prerequisites

Before you use the NetApp Kubernetes Service, you must enable it using the NetApp Hybrid Cloud Control.
See information on deploying cloud services on NetApp HCI.

Workflow overview

To create and manage clusters using the NetApp Kubernetes Service, do the following:
* Access the NetApp Kubernetes Service on NetApp Cloud Central.
* Create a cluster on NetApp HCI using the NetApp Kubernetes Service.
* Create a project within a workspace in the NetApp Kubernetes Service.
* Add applications or solutions to your clusters in the NetApp Kubernetes Service.

Find more information

- NetApp Cloud Central
- NetApp Cloud Documentation
- NetApp Kubernetes Service Documentation

Access NetApp Kubernetes Service

You can access NetApp Kubernetes Service directly with its own address or by selecting the product option from the Cloud Central product list.

Steps

1. Go to the NetApp Kubernetes Service Login page.
2. Enter your Cloud Central login credentials and click **Login**.

If you do not see any systems listed, make sure that the NetApp HCI administrator is added to your NetApp Cloud Central account.

3. If you do not have a Cloud Central account, on the Cloud Central Login page, click **Sign Up**.
4. Using Cloud Central, you can set up accounts either as individual accounts or as Federated accounts:
    a. You can make a new account with name, email, and password and then you will be logged in. This is the simplest type of account.
    b. If you are part of a Cloud Central Federated organization, you enter your email and are then routed to the organization login.
5. From other Cloud Central products, select **Products** > **NetApp Kubernetes Service**.

Find more information

- NetApp Cloud Central
- NetApp Cloud Documentation
- NetApp Kubernetes Service Documentation

Creating a Kubernetes cluster using the NetApp Kubernetes Service

After you enable cloud services, you can create Kubernetes user clusters on a NetApp HCI on-premise system using the NetApp Kubernetes Service.

Prerequisites

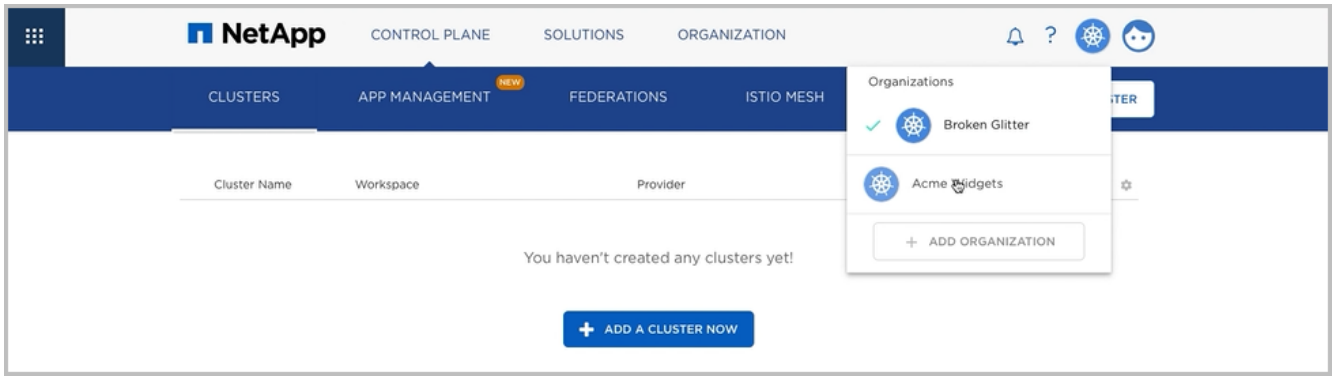
Before you use NetApp Kubernetes Service with NetApp HCI, you must enable the service using the NetApp Hybrid Cloud Control.
See information on deploying cloud services on NetApp HCI.

About this task

You create Kubernetes clusters, add them to a workspace, create a project within that workspace, and later add a solution to the project. After you create the clusters, those clusters are ready to accept application workloads, including predesigned or your own applications.

Logging in to NetApp Cloud Central

1. From NetApp Cloud Central, select **Products** > **NetApp Kubernetes Service**.
2. Log in using your Cloud Central credentials.

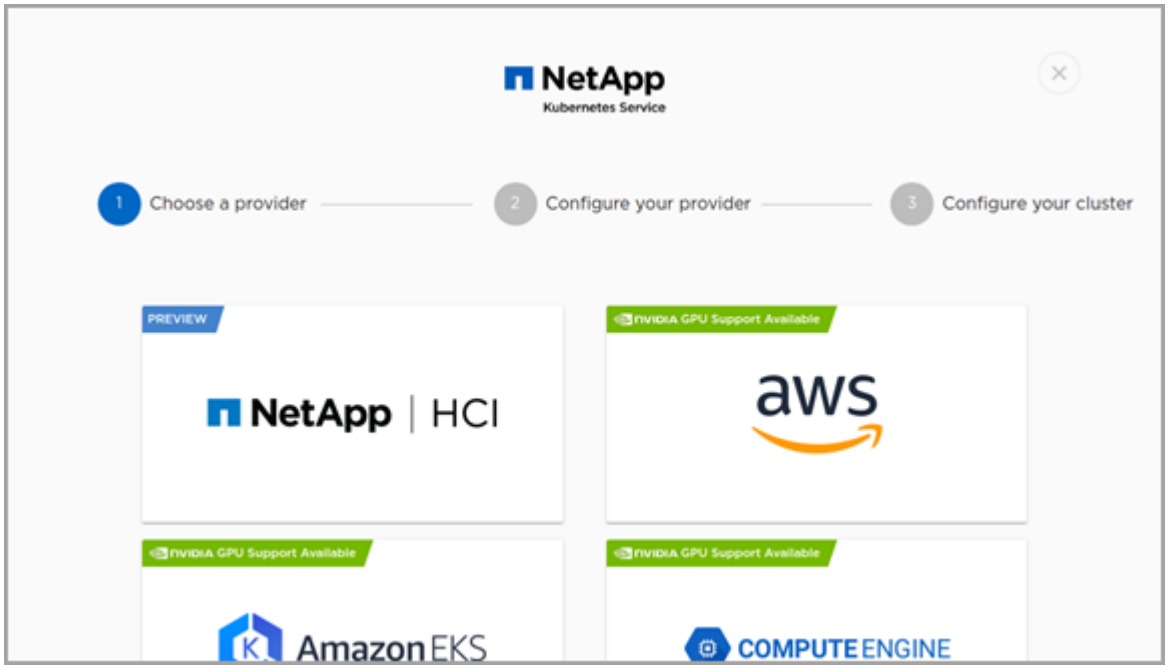


Choosing a provider

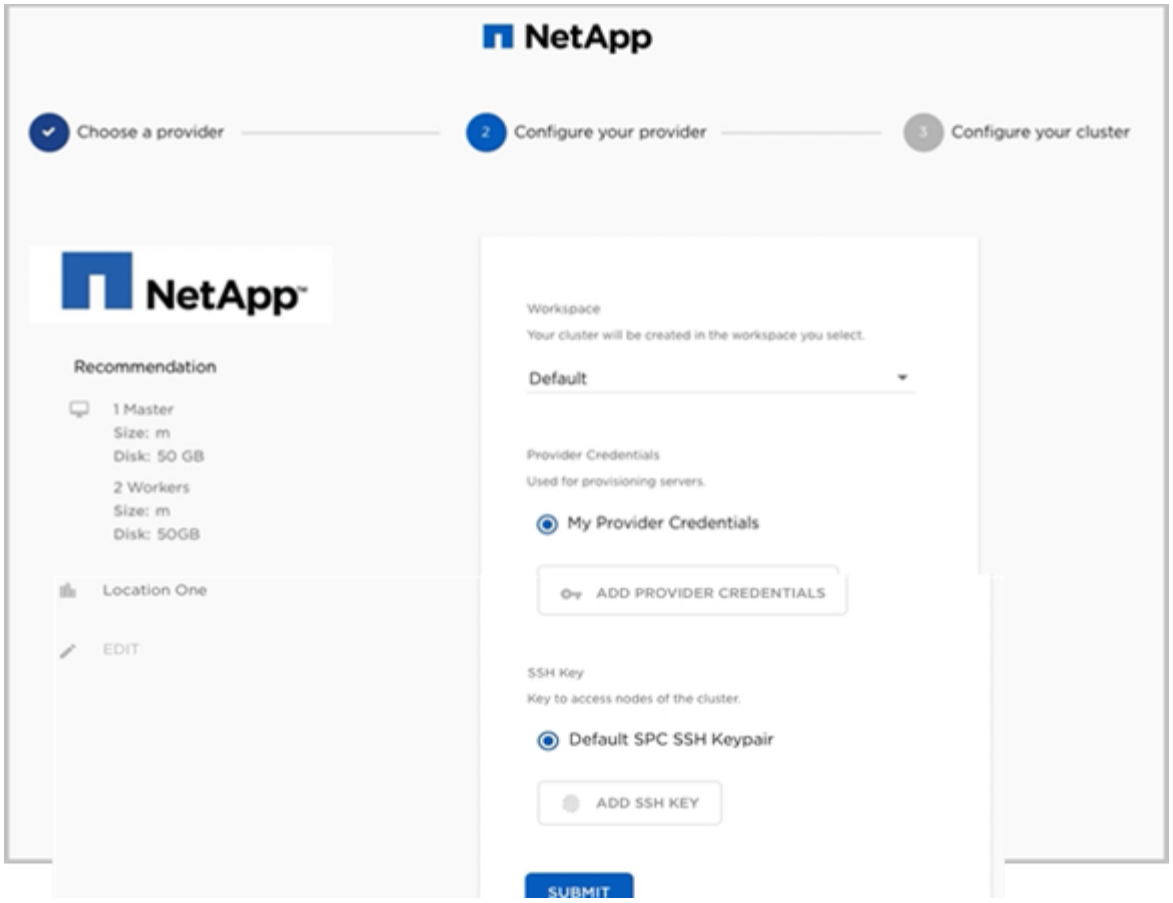
1. Click **Organizations** and choose your organization.

2. Click **Control Plane**.
3. Click **Add Cluster**.

   A list of providers appears, including NetApp HCI.



4. Choose **NetApp HCI** as the provider.



Configuring your provider

1. Select the region, the workspace in which the cluster will be located, and SSH key pair for the cluster.

   In most cases you can just accept the defaults.

2. To edit any of the default values for the cluster nodes, click **Edit** and customize the number, size, and disk space allotted to the cluster nodes. If there is more than one NetApp HCI installation in the organization, you can select additional systems.
3. Click **Submit**.

Configuring your cluster

1. Configure your Kubernetes cluster by entering the cluster name.
2. Typically, use the default settings.
3. Click **Submit**.

Result

The NetApp Kubernetes Service creates the cluster and displays it on the Clusters page.

Deleting a Kubernetes cluster

In the NKS preview environment, if you want to delete a Kubernetes cluster, contact NetApp Technical Support for assistance.
The NKS preview environment will be removed.

After you finish

Continue with Creating a project within a NetApp Kubernetes Service workspace you specified so that you can later add applications or solutions to the project.

Find more information

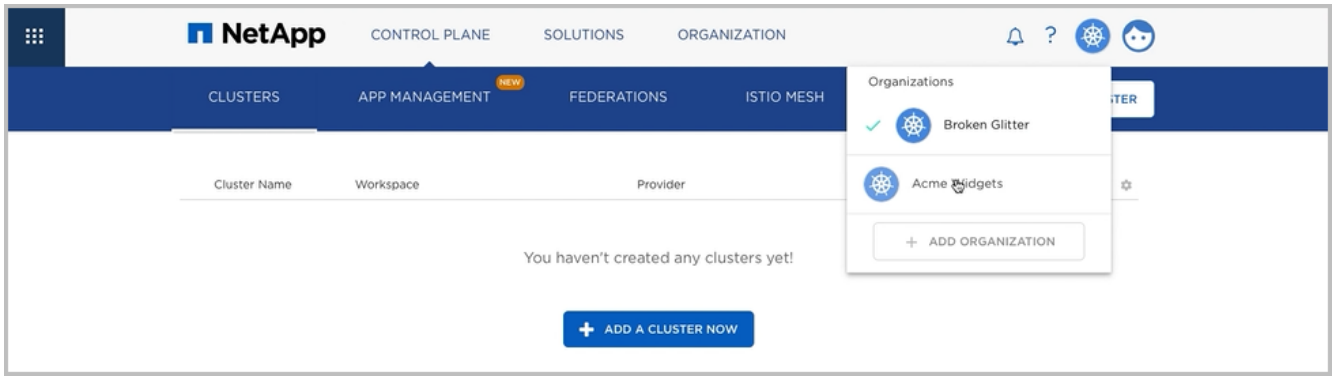
- NetApp Cloud Central
- NetApp Cloud Documentation
- NetApp Kubernetes Service Documentation

Create a project within a NetApp Kubernetes Service workspace

When you create Kubernetes user clusters, you select a workspace in the NetApp Kubernetes Service. You can create a project within that workspace and later add a solution to the project.

Steps

1. From NetApp Cloud Central, select **Products** > **NetApp Kubernetes Service**.
2. Log in using your Cloud Central credentials.



3. Click **Organization**.

4. To add a team, to which you can later add to your workspace, click **Teams**, click **Add Team**, add a

team name, select members, and click **Submit**.

5. To add a workspace, to which you can later add projects, click **Workspaces**, click **Add Workspace**, add a workspace name, select teams, and click **Submit**.

After you finish

Continue with Adding applications to your Kubernetes cluster.

Find more information

- NetApp Cloud Central
- NetApp Cloud Documentation
- NetApp Kubernetes Service Documentation

Storage classes with NetApp Kubernetes Service on NetApp HCI

After you enable cloud services on NetApp HCI and enable NetApp Kubernetes Service (NKS), Kubernetes storage classes are created.

When you add applications in NKS, you need to know the storage class and its provisioner.

Storage classes with NKS

The following table lists the storage classes and the associated provisioners and IOPS values.

Storage class	Provisioner	IOPS minimum	IOPS maximum	IOPS burst
solidfire-bronze	netapp.io/trident	1000	4000	6000
solidfire-silver	netapp.io/trident	5000	25,000	40,000
solidfire-gold	netapp.io/trident	15,000	180,000	200,000
vsphere (default)	kubernetes.io/vsphere-volume	NA	NA	NA

Storage class impact

Storage classes affect storage pools, QoS values, and persistent volume claims in the following ways:

- Each NetApp Element storage class uses a unique storage pool.
- Storage pools are identified by a set of unique QoS (IOPS) values.
- When a Persistent Volume Claim (PVC) uses one of the "solidfire" storage classes, a volume within

the referred storage pool is created on Element.

- Trident creates the PV with the storage class and the storage pool attributes.
- Kubernetes mounts the volume to the pod.

Example of PVC using a storage class

This example shows a volume created with the *solidfire-gold* storage class IOPS values on Element. When a pod uses this PVC, the new volume with the *solidfire-gold* IOPS values is mounted to the pod.

```
kind: PersistentVolumeClaim
apiVersion: v1
metadata:
      name: pvcclaim-gold
spec:
  accessModes:
  - ReadWriteOnce
  resources:
    requests:
      storage: 10Gi
  storageClassName: solidfire-gold
```

Find more information

- NetApp Cloud Central
- NetApp Cloud Documentation
- NetApp HCI Documentation Center

Add applications to a Kubernetes cluster

After you create your Kubernetes user cluster, you can easily add any number of applications to the cluster. Using this feature, you gain tremendous efficiency of spinning up or down applications as needed.

About this task

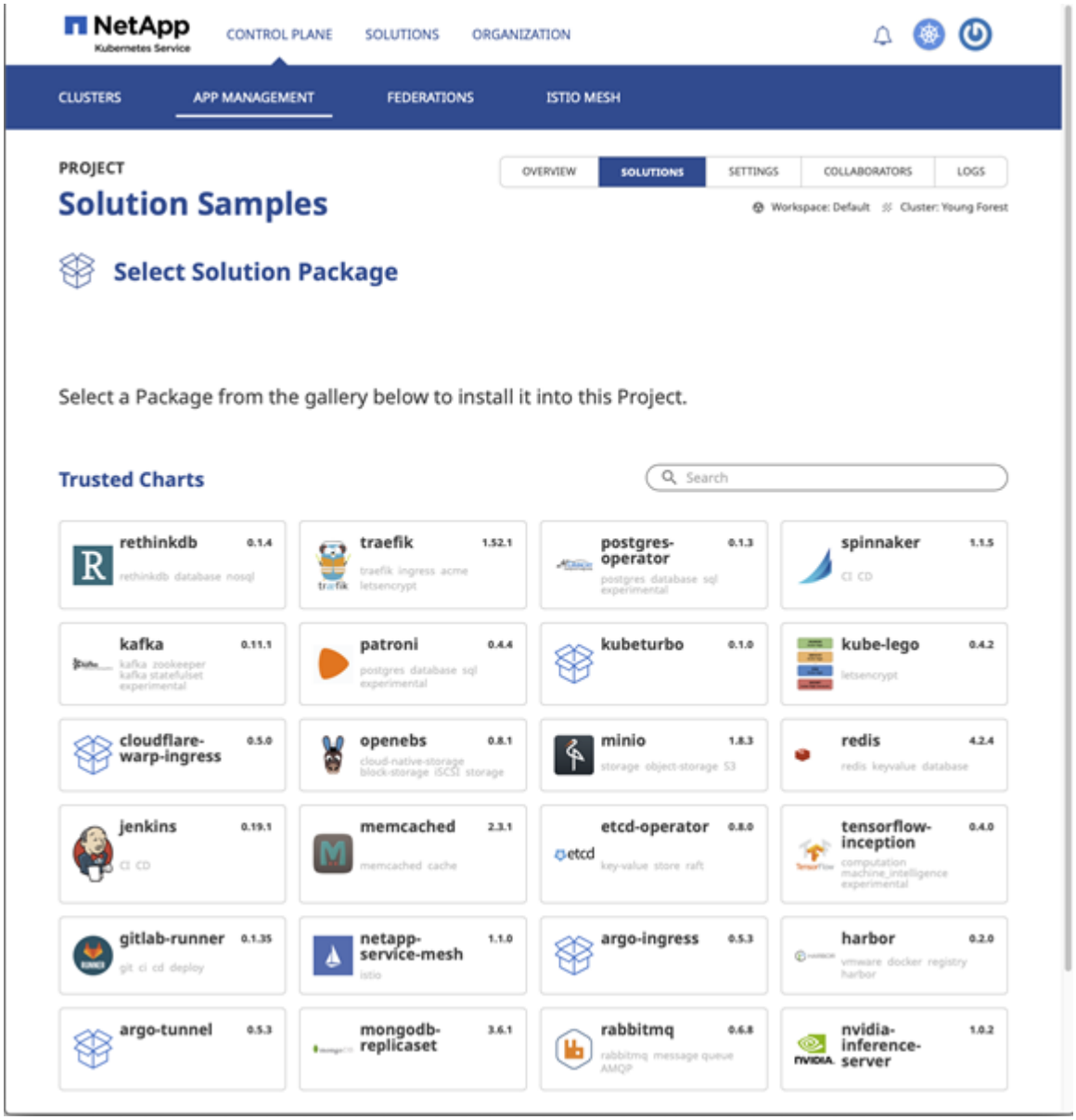
You can deploy applications on the cluster that resides on NetApp HCI by using the NetApp Kubernetes Service.

When you add applications to your Kubernetes cluster, you need to know about storage classes.
See Storage classes with NKS on NetApp HCI.

Steps

1. From NetApp Cloud Central, select **Products** > **NetApp Kubernetes Service**.

2. To add an application to your existing Kubernetes cluster, click **Solutions**.



Find more information

- NetApp Cloud Central
- NetApp Cloud Documentation
- NetApp Kubernetes Service Documentation

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