Installing Cisco Container Platform on vSphere Web Client

This chapter contains the following topics:

Installing Cisco Container Platform

Installing Cisco Container Platform is a three-step process:

- Importing Cisco Container Platform Tenant Base VM

  The Cisco Container Platform tenant base VM contains the container image and the files that are necessary to create the tenant Kubernetes clusters that are used for configuring monitoring, logging, container network interfaces (CNI), and persistent volumes.

- Deploying Installer VM, on page 3

  The Installer VM contains the VM image and the files for installing other components such as Kubernetes and the Cisco Container Platform application.

- Deploying Cisco Container Platform, on page 5

  The Cisco Container Platform Control Plane is set up using an installer UI. After the installer VM is switched on, the URL of the installer appears on the vCenter **Web console**.

Importing Cisco Container Platform Tenant Base VM

Before you begin

- Ensure that you have configured the storage and networking requirements. For more information, see Storage Requirements and Network Requirements.

- Ensure that vSphere has an Enterprise Plus license, which supports DRS and vSphere HA.

Step 1   Log in to the **VMware vSphere Web Client** as an administrator.

Step 2   In the **Navigation** pane, right-click the cluster on which you want to deploy Cisco Container Platform, and then choose **Deploy OVF Template**.
The **Deploy OVF Template** wizard appears.

Step 3   In the **Select template** screen, perform these steps:

a) Click the **URL** radio button, and enter the URL of the Cisco Container Platform tenant OVA.

Alternatively, click the **Local file** radio button, and browse to the location where the Cisco Container Platform tenant OVA is saved on your computer.

b) Click **Next**.

Step 4   In the **Select name and location** screen, perform these steps:

a) In the **Name** field, enter a name for the Cisco Container Platform tenant base VM.

Note   You need to note down the Cisco Container Platform tenant base VM name as you will need to specify it while creating a cluster.

b) In the **Browse** tab, choose the data center where you want to deploy Cisco Container Platform.

c) Click **Next**.

Step 5   In the **Select a resource** screen, choose a cluster where you want to run the Cisco Container Platform tenant base VM, and then click **Next**.

Step 6   In the **Review details** screen, verify the Cisco Container Platform tenant base VM details, and then click **Next**.
The **Select storage** screen appears.

Figure 1: Select Storage Screen
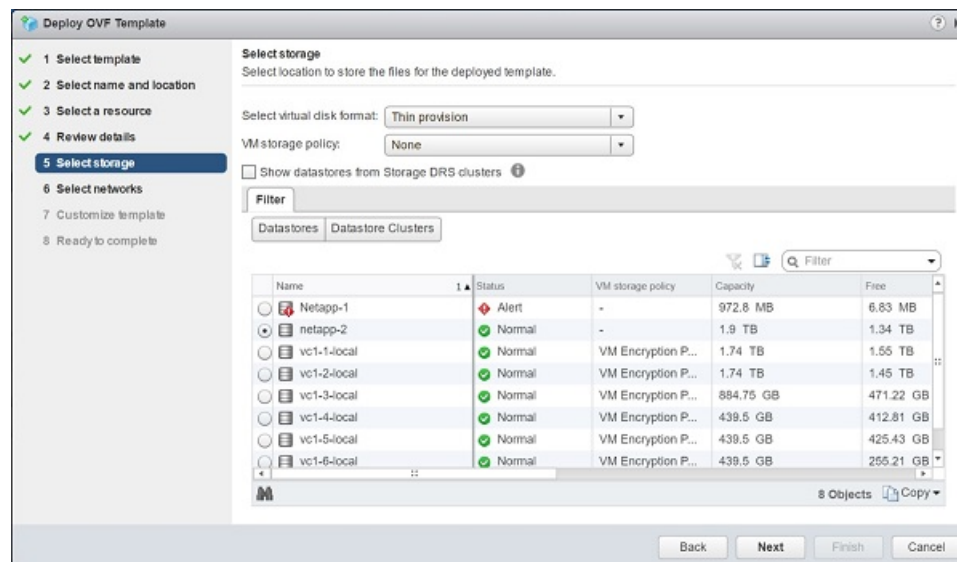
Step 7   In the **Select storage** screen, perform these steps:

a) From the **Select virtual disk format** drop-down list, choose **Thin Provision** to allocate storage on demand.

b) In the **Filters** tab, choose a destination datastore for the Cisco Container Platform tenant base VM.

c) Click **Next**.

The **Select networks** screen appears.

Figure 2: Select Networks Screen
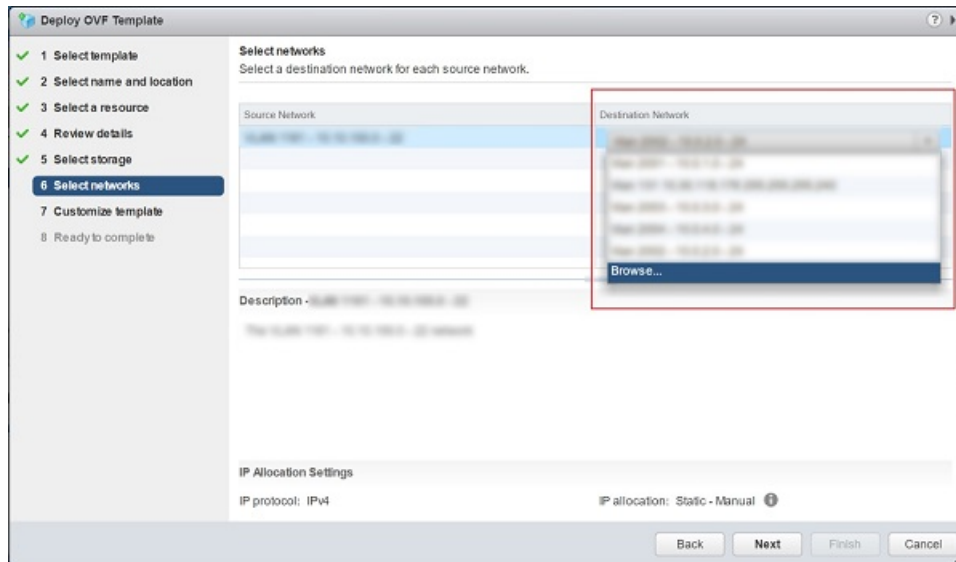
Step 8   In the **Select networks** screen, perform these steps:

a) From the **Destination Network** column, choose a network for each source network that is available in the Cisco Container Platform tenant base VM.

b) Click **Next**.

Step 9   In the **Customize template** screen, click **Next**.

Step 10   In the **Ready to complete** screen, verify the Cisco Container Platform tenant base VM settings, and then click **Finish**. The Cisco Container Platform tenant base VM import takes few minutes to complete.

Deploying Installer VM

Before you begin

Note   This deployment is for new installations of Cisco Container Platform. For upgrades, see Upgrading Cisco Container Platform, on page 9.

Ensure that you have imported the latest Cisco Container Platform tenant base VM to the vCenter instance. For more information, see Importing Cisco Container Platform Tenant Base VM, on page 1.

Step 1   Log in to the **VMware vSphere Web Client** as an administrator.

Step 2   In the **Navigation** pane, right-click the cluster on which you want to deploy Cisco Container Platform, and then choose **Deploy OVF Template**.
The **Deploy OVF Template** wizard appears.

Step 3   In the **Select template** screen, perform these steps:

    a) Click the **URL** radio button, and enter the URL of the Installer OVA.

       Alternatively, click the **Local file** radio button, and browse to the location where the installer OVA is saved on your computer.

    b) Click **Next**.

Step 4   In the **Select name and location** screen, perform these steps:

    a) In the **Name** field, enter a name for the installer VM.

    b) In the **Browse** tab, choose the data center where you want to deploy Cisco Container Platform.

    c) Click **Next**.

Step 5   In the **Select a resource** screen, choose the cluster where you want to run the installer VM, and then click **Next**.

Step 6   In the **Review details** screen, verify the template details, and then click **Next**.

Step 7   In the **Select storage** screen, perform these steps:

    a) From the **Select virtual disk format** drop-down list, choose **Thin Provision** to allocate storage on demand.

    b) In the **Filters** tab, choose a destination datastore to store the installer VM.

    c) Click **Next**.

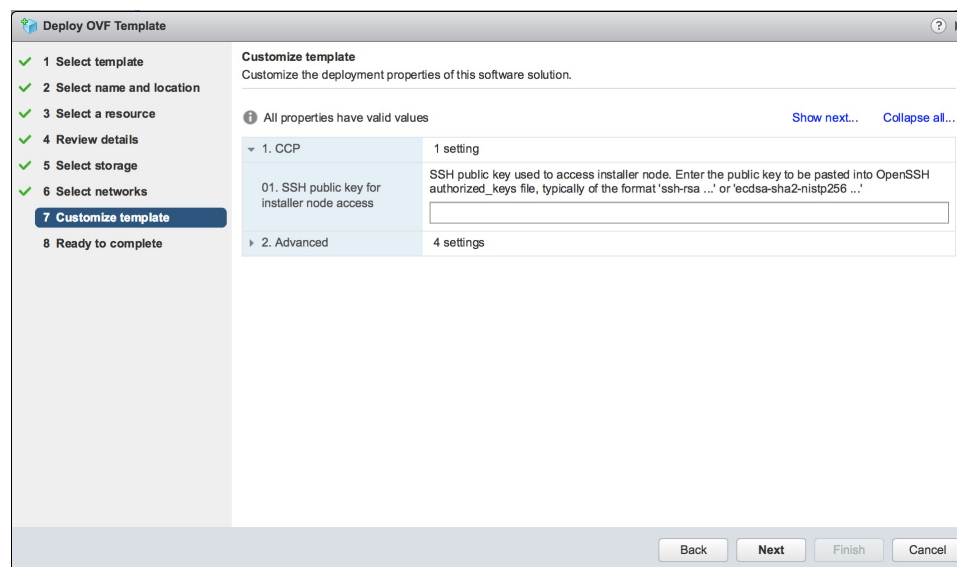**Step 8**   In the **Select networks** screen, perform these steps:

    a) From the **Destination Network** column, choose a network for each source network that is available in the installer VM.

       Note   The selected network must have access to vCenter and the tenant VM networks.

    b) Click **Next**.

    The **Customize template** screen appears.

Figure 3: Customize Template Screen

Step 9   In the **Customize template** screen, enter the following optional parameters to customize the deployment properties:

    a) Expand **CCP**, in the **SSH public key for installer node access** field, enter an ssh public key.

   You can use this key to ssh to the installer VM.

Note	• Ensure that you enter the public key in a single line.
	• If you do not have an SSH key pair, you can generate it using the **ssh-keygen** command.

b) Expand **Advanced**, in the **CIDR for kubernetes pod network** field, **192.168.0.0/16** is displayed as the default pod network CIDR of the Kubernetes cluster for the installer. If the CIDR IP addresses conflict with the tenant cluster VM network or the vCenter network, you need to set a different value for the CIDR.

c) Click **Next**.

Step 10 In the **Ready to complete** screen, verify the installer VM deployment settings, and then click **Finish**.

Step 11 Click the **Power on** button to switch on the VM.

Figure 4: Switching on Installer VM
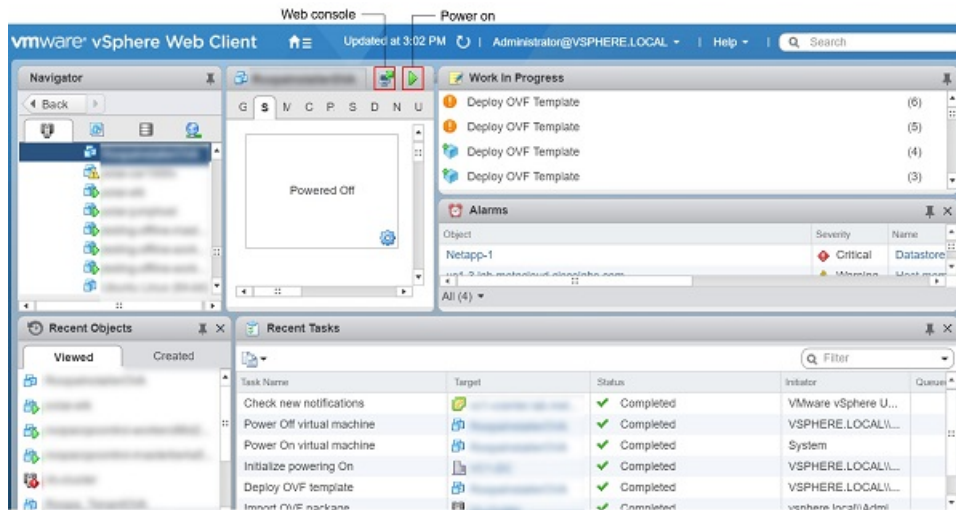
Once the installer VM is switched on, the installer UI takes a few minutes to become ready. You can view the status of the Installer UI using the Web console of vCenter. When the installer UI is ready, you can access it using the URL from the Web console.

Deploying Cisco Container Platform

The Cisco Container Platform Control Plane is set up using an installer UI. After the installer VM is switched on, the URL of the installer appears on the vCenter **Web console**.

Step 1 Obtain the URL from the vCenter **Web console** and use a browser to open the installer UI.
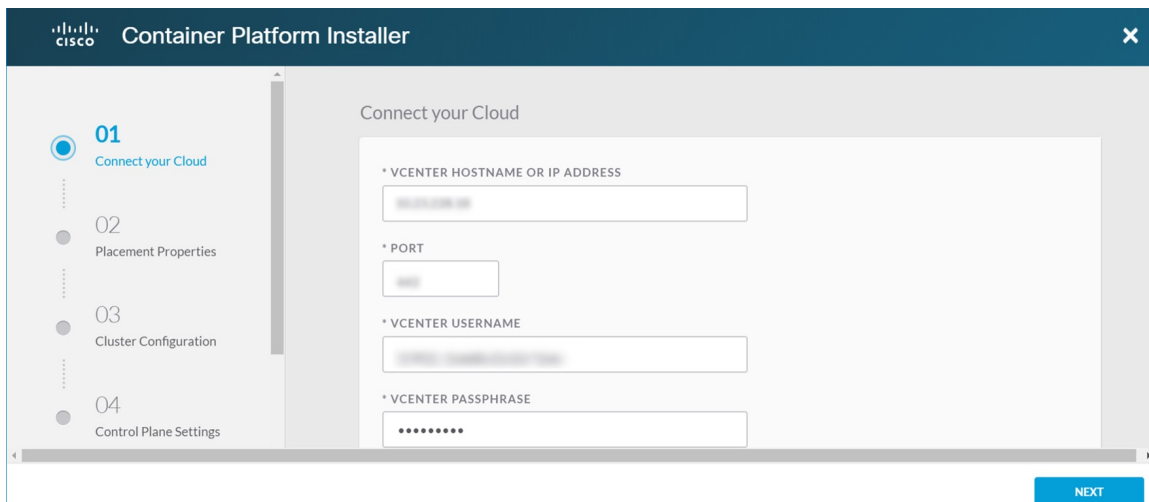
The **Welcome** screen appears.

Figure 5: Welcome Screen
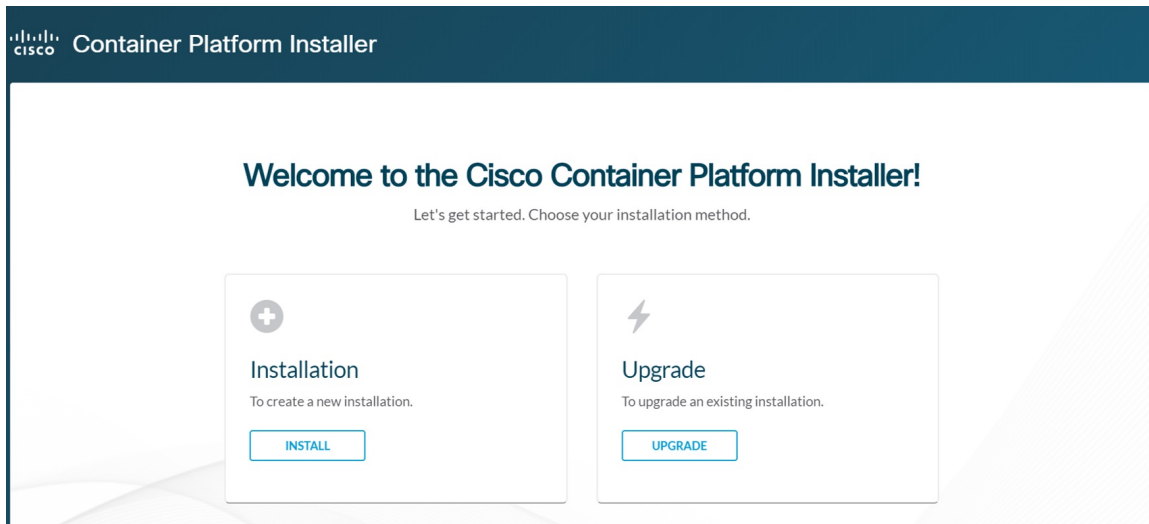
Step 2   Click **Install**.

The **Connect your Cloud** screen appears.

Figure 6: Connect your Cloud Screen

Step 3   In the **Connect your Cloud** screen, enter the following information:

a)   In the **VCENTER HOSTNAME OR IP ADDRESS** field, enter the IP address of the vCenter instance that you want to use.

b)   In the **PORT** field, enter the port of the vCenter instance that you want to use.

c)   In the **VCENTER USERNAME** field, enter the username of the user with administrator access to the vCenter instance.

d)   In the **VCENTER PASSPHRASE** field, enter the passphrase of the vCenter user.

e)   Click **CONNECT**.

The **Placement Properties** screen appears.

Figure 7: Placement Properties Screen

Step 4 In the **Placement Properties** screen, enter the following information:

a) From the **VSPHERE DATACENTER** drop-down list, choose the datacenter.

b) From the **VSPHERE CLUSTER** drop-down list, choose the cluster.

c) From the **VSPHERE DATASTORE** drop-down list, choose the datastore.

d) From the **VSPHERE NETWORK** drop-down list, choose the network.

e) In the **BASE VM IMAGE** field, enter the Cisco Container Platform tenant base VM name from Step 5 of the Importing Cisco Container Platform Tenant Base VM task.

f) Click **NEXT**.

The **Cluster Configuration** screen appears.

Figure 8: Cluster Configuration Screen

Step 5 In the **Cluster Configuration** screen, enter the following information:

a) From the **NETWORK PLUGIN FOR TENANT K8S CLUSTERS** drop-down list, choose one of the following options for network connectivity:

• Calico

• ACI

• Contiv (Tech Preview)

b) In the **CIDR FOR KUBERNETES POD NETWORK** field, **192.168.0.0/16** is displayed as the default pod network CIDR of the Kubernetes cluster for the installer. If the CIDR IP addresses conflict with the tenant cluster VM network or the vCenter network, you need to set a different value for the CIDR.

c) In the **CCP CONTROLLER MASTER NODE VIRTUAL IP** field, enter the IP address that is used to support a Cisco Container Platform upgrade.

d) In the **USERNAME FOR NODE ACCESS** field, enter the username of the user who can ssh into the Cisco Container Platform Control Plane nodes.

e) In the **SSH PUBLIC KEY FOR INSTALLER NODE ACCESS** field, enter an ssh public key.

You can use this key to ssh to the Control Plane nodes.

Note	• Ensure that you enter the public key in a single line.
	• If you do not have an SSH key pair, you can generate it using the **ssh-keygen** command.

f) Click **NEXT**.

The **Control Plane Settings** screen appears.

Figure 9: Control Plane Settings Screen

Step 6 In the **Control Plane Settings** screen, enter the following information:

a) In the **CONTROL PLANE NAME** field, enter the name of the Cisco Container Platform cluster.

Note	• The cluster name must start with an alphanumeric character (a-z, A-Z, 0-9). It can contain a combination of hyphen (-) symbols and alphanumeric characters (a-z, A-Z, 0-9). The maximum length of the cluster name is 46 characters.
	• Deployment of the installer VM fails if another Control Plane cluster with the same name already exists on the same datastore. You must ensure that you specify a unique name for the Control Plane cluster.

b) In the **CCP VERSION** field, enter the version of the Cisco Container Platform cluster.

c) From the **CCP LICENSE ENTITLEMENT** drop-down list, choose an entitlement option that indicates the type of Smart Licensing that you want to use.

> **Note**   The **Partner** option will only be used in conjunction with a **Not for Retail (NFR)** or **Trial** license.

d) In the **CREATE YOUR ADMIN PASSPHRASE** field, enter the passphrase you want to use for an **Administrator** user of the Cisco Container Platform Control Plane.

e) Expand **Advanced Settings**, in the **NTP SERVERS** field, enter the list of any NTP servers in your environment.

f) Click **DEPLOY** and then monitor the installation progress through the vCenter **Web console**.

> **Note**   You can use the ssh private key to access the Installer, control plane VMs, or the tenant cluster VMs. However, logging into these VMs using a username and password is not supported.

Upgrading Cisco Container Platform

Upgrading Cisco Container Platform and upgrading tenant clusters are independent operations. You must upgrade the Cisco Container Platform to allow tenant clusters to upgrade. Specifically, tenant clusters cannot be upgraded to a higher version than the Control Plane. For example, if the Control Plane is at version 1.10, the tenant cluster cannot be upgraded to the 1.11 version.

Upgrading Cisco Container Platform is a three-step process:

- Upgrading Cisco Container Platform Tenant Base VM, on page 9
- Deploying Upgrade VM, on page 9
- Upgrading Cisco Container Platform, on page 10

> **Note**   Taking a snapshot of the VMs managed by Cisco Container Platform is currently unsupported and results in failures during upgrades.

Upgrading Cisco Container Platform Tenant Base VM

You can follow the instructions in the Installing Cisco Container Platform > Importing Cisco Container Platform Tenant Base VM section.

> **Note**   The older tenant images are no longer required, you can delete them from your vCenter instance.

Deploying Upgrade VM

Follow the instructions in the Installing Cisco Container Platform > Deploying Installer VM section to deploy the latest VM.

It may take a few minutes for the deployment of the VM to complete. You can view the status of the upgrade task using the Web console of vCenter.

Note Depending on CNI usage, the port used to access Cisco Container Platform may change as part of the upgrade.

Upgrading Cisco Container Platform

The Cisco Container Platform Control Plane is upgraded using an installer UI. After the installer VM is switched on, the URL of the installer appears on the vCenter **Web console**.

Step 1 Obtain the URL from the vCenter **Web console** and use a browser to open the installer UI.

Step 2 Click **Upgrade**.

Step 3 In the **Connect your Cloud** screen, enter the following information:

a) In the **VCENTER HOSTNAME OR IP ADDRESS** field, enter the IP address of the vCenter instance that you want to use.

b) In the **PORT** field, enter the port of the vCenter instance that you want to use.

c) In the **VCENTER USERNAME** field, enter the username of the user with administrator access to the vCenter instance.

d) In the **VCENTER PASSPHRASE** field, enter the passphrase of the vCenter user.

e) Click **CONNECT**.

Step 4 In the **Placement Properties** screen, enter the following information:

a) In the **CISCO CONTAINER PLATFORM (CCP) URL** field, enter the URL for accessing Cisco Container Platform in the following format:

https://*<CCP_IP_Address>:<Port>*

b) From the **VSPHERE DATACENTER** drop-down list, choose the datacenter.

c) From the **BASE VM IMAGE** drop-down list, choose the Cisco Container Platform tenant base VM name.

d) Click **NEXT**.

Step 5 In the **Cluster Configuration** screen, enter the following information:

a) In the **CIDR FOR KUBERNETES POD NETWORK** field, **192.168.0.0/16** is displayed as the default pod network CIDR of the Kubernetes cluster for the installer. If the CIDR IP addresses conflict with the tenant cluster VM network or the vCenter network, you need to set a different value for the CIDR.

b) In the **USERNAME FOR NODE ACCESS** field, enter the username of the user who can ssh into the Cisco Container Platform Control Plane nodes.

c) In the **SSH PUBLIC KEY FOR INSTALLER NODE ACCESS** field, enter an ssh public key.

You can use this key to ssh to the Control Plane nodes.

Note
- Ensure that you enter the public key in a single line.

- You can use the private key to securely connect to the Cisco Container Platform Control Plane VMs through SSH, after installation.

- If you do not have an SSH key pair, you can generate it using the **ssh-keygen** command.

d) Click **NEXT**.

Step 6   In the **Control Plane Settings** screen, enter the following information:

a) In the **CONTROL PLANE NAME** field, enter the name of the Cisco Container Platform cluster.

    Note   You need to enter the same cluster name that you used during installation.

b) From the **CCP LICENSE ENTITLEMENT** drop-down list, choose an entitlement option that indicates the type of Smart Licensing that you want to use.

    Note   The **Partner** option will only be used in conjunction with a **Not for Retail (NFR)** or **Trial** license.

c) In the **ENTER CURRENT ADMIN PASSPHRASE** field, enter the current passphrase for an **Administrator** user of the Cisco Container Platform Control Plane.

d) Click **UPGRADE**.

Uninstalling Cisco Container Platform

Uninstalling Cisco Container Platform removes all containers and services associated with it. You will no longer be able to create or manage tenant clusters on this Cisco Container Platform instance.

Step 1   Open the Cisco Container Platform web interface, log in to the Control Plane cluster using its VIP address, and then delete all the Kubernetes tenant clusters that belong to the Cisco Container Platform instance.

For more information on deleting Kubernetes clusters, refer to the *Cisco Container Platform User Guide*.

Step 2   Follow these steps to delete the Control Plane and installer node VMs:

a) In the vSphere web client, right-click the VM, choose **Power** > **Power off**, and then click **Yes** in the confirmation dialog box.

b) Right-click each VM and choose **Delete from Disk**.

Step 3   Follow these steps to delete the Control Plane cluster data disks:

a) In the vSphere web client, choose **Home** > **Storage**.

b) From the left pane, choose the datastore that is used to install the Control Plane VMs. This is the same as the datastore to which the installer VM is imported to unless you have changed it in the installer UI.

c) If you have installed the Control Plane using the default name, right-click the folder name with the prefix **ccpcontrol** or if you have provided a different name to the Control Plane in the installer UI, right-click the folder with that name.

d) Choose **Delete File**.

Backing Up and Restoring Cisco Container Platform

This chapter contains the following topics:

Backing Up Cisco Container Platform

You can back up the Cisco Container Platform application data that pertains to the following components:

• Application users

- Virtualization providers
- Tenant clusters

| **Note** | The logging or monitoring data from Prometheus, Grafana, and the EFK stack is not included in the backup archive. |

Backing Up Cisco Container Platform v1.5.0+

Step 1 Log in to the console of the master node of Cisco Container Platform Control Plane.

Step 2 Run the following command.

```
/ccp_related_files/percona_backup.sh ./backup.tar
```

Step 3 Copy the `backup.tar` backup archive to a secure location.

| **Note** | You must ensure that the backup archive is maintained securely as anyone with access to it has administrative capabilities on all tenant clusters. |

Backing Up Cisco Container Platform v1.1.0-1.4.x

Step 1 Log in to the console of the master node of Cisco Container Platform Control Plane.

Step 2 Run the following commands.

```
kubectl exec mysql-0 -- mkdir -p /tmp/backup
kubectl exec -t mysql-0 -- bash -c "rm -Rf /tmp/backup/* && xtrabackup --backup
--target-dir=/tmp/backup  -p$(kubectl get secret mysql -o jsonpath='{.data.mysql-root-password}'|base64
 -d)   --alsologtostderr=true"
kubectl exec mysql-0 -- tar -cvf /tmp/backup.tar /tmp/backup
kubectl cp mysql-0:/tmp/backup.tar ./backup.tar
```

| **Note** | Depending on the memory usage of the database, any of the preceding commands may fail with an **ExitCode:137** error code. It is safe to run these commands multiple times until they succeed. |

Step 3 Copy the `backup.tar` backup archive to a secure location.

| **Note** | You must ensure that the backup archive is maintained securely as anyone with access to it has administrative capabilities on all tenant clusters. |

Restoring Cisco Container Platform

You can restore a valid backup to a new Cisco Container Platform Control Plane that has control over all existing Cisco Container Platform settings and tenant clusters.

Restoring Cisco Container Platform Control Plane data is slightly different from traditional restore methods. The data can be restored into a version of Cisco Container Platform newer than the version from which the backup was made.

For example, you may back up the data from a Cisco Container Platform Control Plane v1.4 installation, and then, as part of a restore or recovery process, restore that data into a new Cisco Container Platform Control Plane v1.5 installation.

You can restore data into any version of Cisco Container Platform v1.5 or later. For example, because upgrades are supported from v1.4 to v1.5, it is possible to restore a v1.4 backup into a new Cisco Container Platform v1.5 install.

Step 1   Power off the VMs that belong to the previous Control Plane instance.

Step 2   Install a new Cisco Container Platform Control Plane v1.5.0+.

Step 3   Copy the backup from the secure location to Control Plane master.

```
scp ./backup.tar <control_plane_master>:/tmp/backup.tar
```

Step 4   Log in to the console of the master node of Cisco Container Platform Control Plane.

Step 5   Run the following command.

```
/ccp_related_files/percona_restore.sh /tmp/backup.tar
```