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 6

  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 HyperFlex Integration Requirements and Network Requirements.

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

- Recommend to use the *vSphere Web Client (Flash)* version of the vSphere Web Client.

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.

Note   The format of the Tenant OVA filename is as follows:

```
ccp-tenant-image-x.y.z-ubuntuXX-a.b.c.ova
```

Where `x.y.z` corresponds to the version of Kubernetes and `a.b.c` corresponds to the version of Cisco Container Platform.

The Version Mapping Table provides the Cisco Container Platform version, Kubernetes version and image names mapping for each release.

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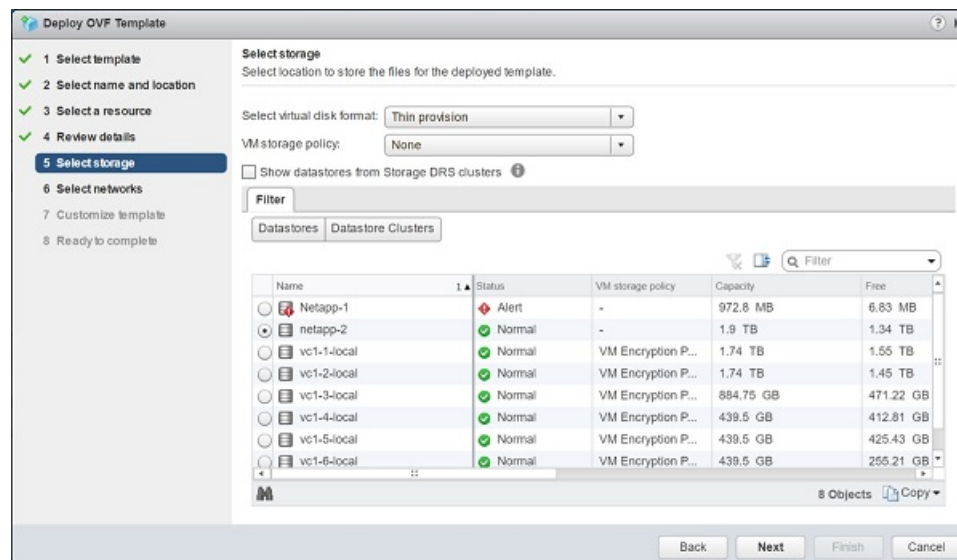
Step 7   In the **Select storage** screen, perform these steps:

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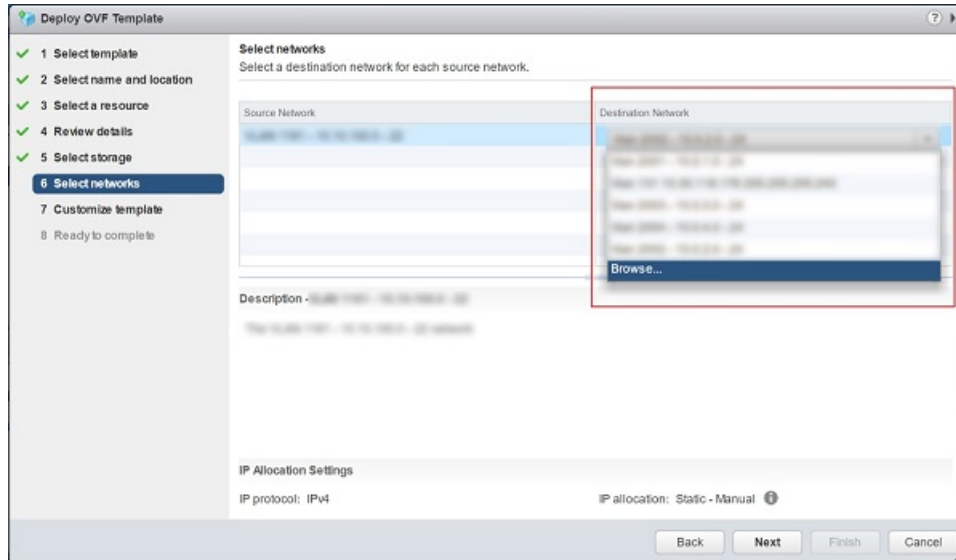
Step 8 In the **Select networks** screen, perform these steps:

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.

Note You can leave the tenant base VM powered off and continue to Deploying Installer VM.

Deploying Installer VM

Before you begin

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

Ensure that you have imported the latest tenant image version during the Importing Cisco Container Platform Tenant Base VM.

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.

> **Note** The format of the Installer OVA filename is as follows:
>
> ```
> kcp-vm-x.y.z.ova
> ```
>
> Where x, y, z corresponds to the major, minor, and patch release of Cisco Container Platform.

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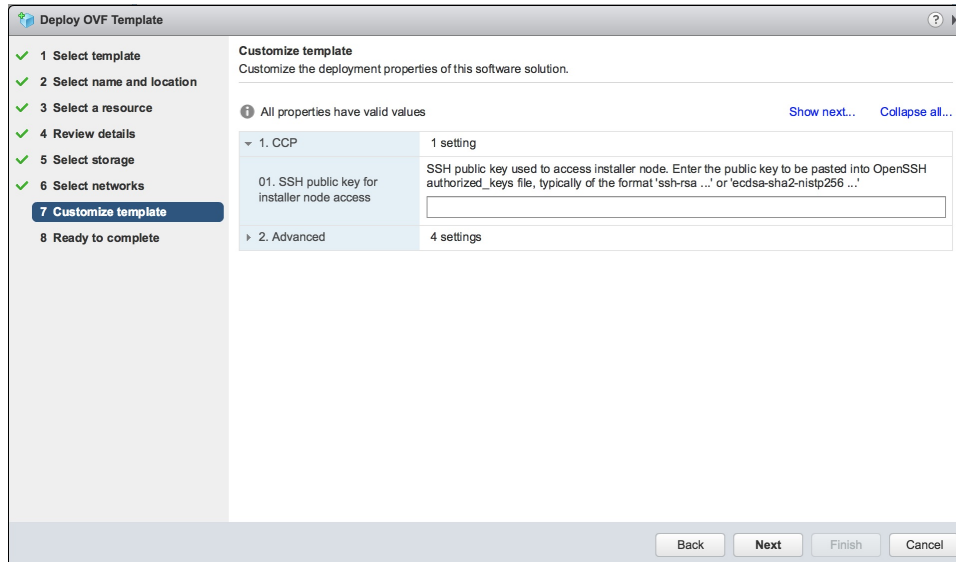
Step 9 In the **Customize template** screen, enter the following optional parameters to customize the deployment properties:

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.
>
> • Ensure that you use the Ed25519 or ECDSA format for the public key.
>
>   **Note:** As RSA and DSA are less secure formats, Cisco prevents the use of these formats.

b) Expand **Advance** and enter the optional fields as necessary.

In the **CIDR for Kubernetes pod network** field, `192.168.0.0/24` 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.

This CIDR is the single large CIDR from which smaller CIDRs are automatically allocated to each node for allocating IP addresses to the pods in the Kubernetes cluster. For more information, refer to https://kubernetes.io/docs/concepts/cluster-administration/networking/.
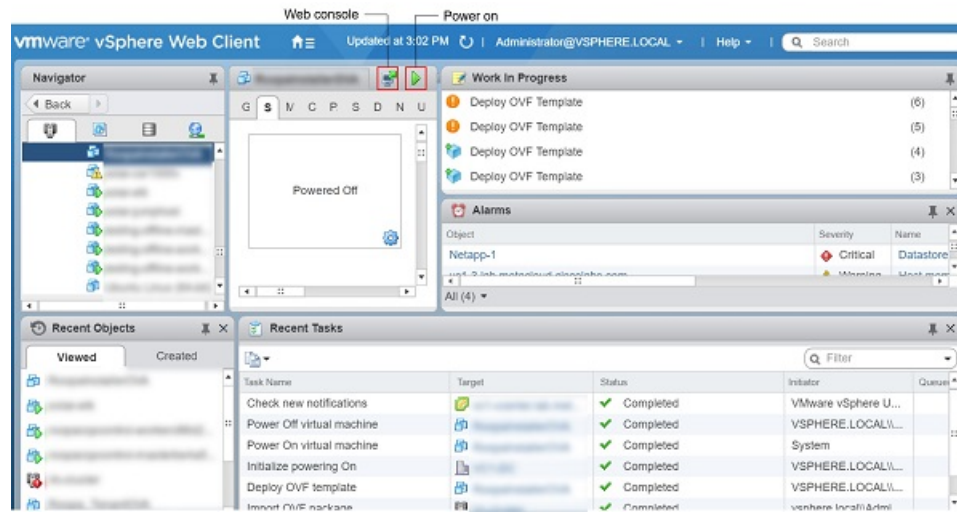
c) Click **Next**.

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**.

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.

Caution   After Deploying Cisco Container Platform, do not change the location of the Control Plane VMs by modifying the datacenter or folder location **in vSphere**. Changing these settings will adversely impact the management of clusters.

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.
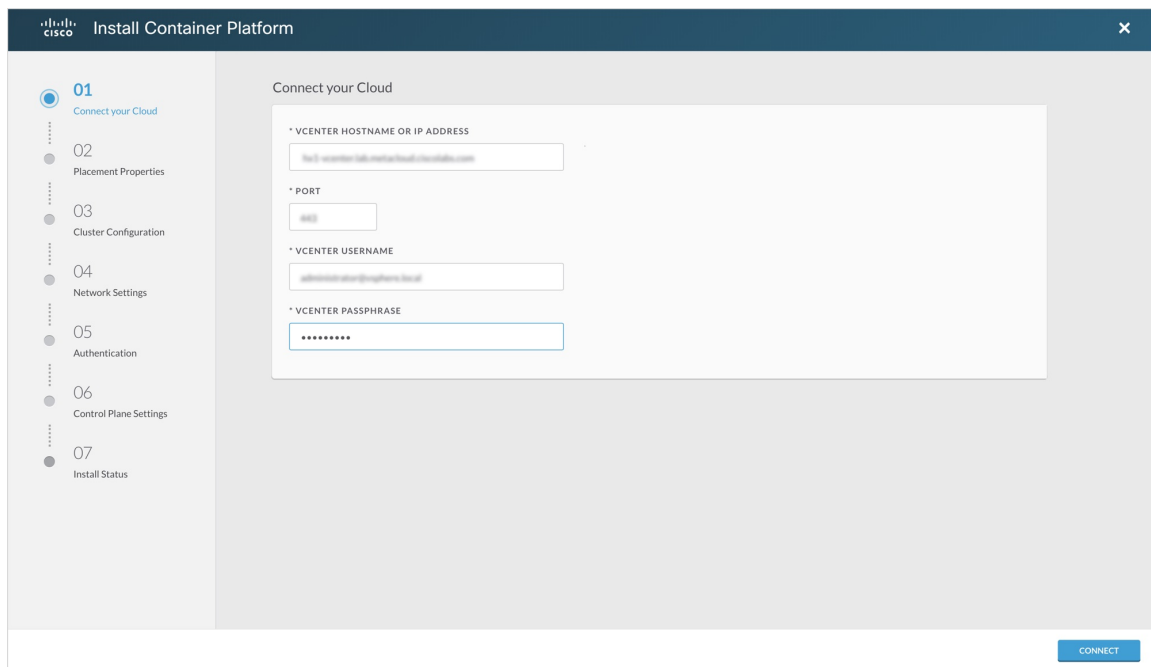
The **Welcome** screen appears.

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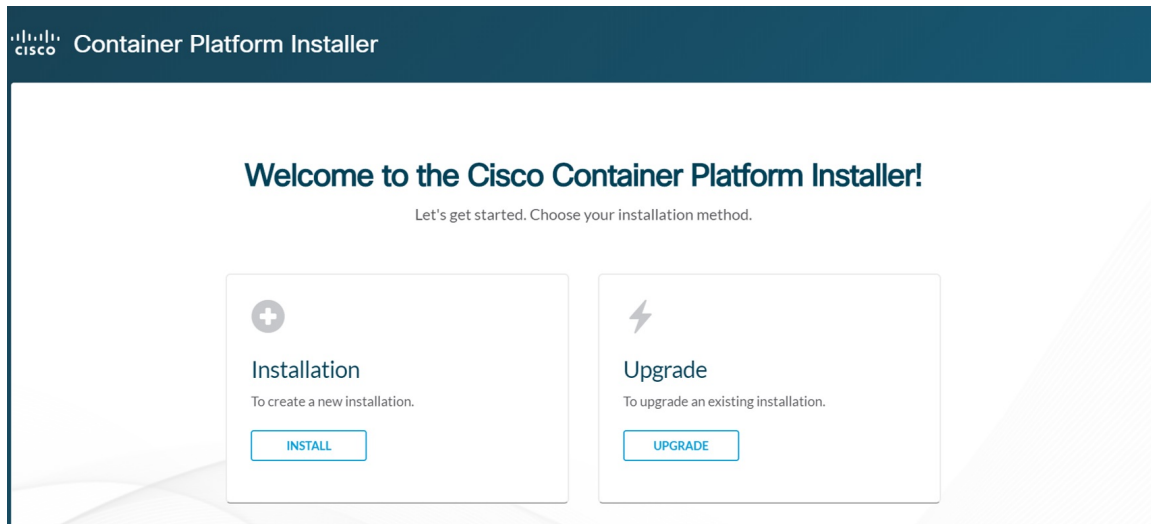
Step 2   Click **Install**.

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 number that your vCenter server uses.

   Note   The default port for vCenter is `443`.

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.

Caution Do not use a datastore located in a nested folder or a Storage DRS (SDRS).

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.

Caution Do not select a VM name that is located in nested folder.

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 KUBERNETES CLUSTERS** drop-down list, choose one of the following options for network connectivity:

- ACI-CNI

- Calico

- Contiv

Note   For more information on the network plugins, see Container Network Interface Plugins.

b) In the **CIDR FOR CONTROLLER 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.

Note   This CIDR is the single large CIDR from which smaller CIDRs are automatically allocated to each node for allocating IP addresses to the pods in the Kubernetes cluster. For more information, refer to https://kubernetes.io/docs/setup/scratch/#network-connectivity.

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

d) In the **SSH PUBLIC KEY FOR 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.

- Ensure that you use the Ed25519 or ECDSA format for the public key.

    Note: As RSA and DSA are less secure formats, Cisco prevents the use of these formats.

e) Click **NEXT**.

The **Network Settings** screen appears.

Figure 9: Network Settings Screen

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

Note   These network settings will be used to configure the Cisco Container Platform web interface.

a) In the **NETWORK NAME** field, enter the name of the network that you want to use.
b) In the **SUBNET CIDR** field, enter a CIDR for your subnet.
c) In the **GATEWAY IP** field, enter the gateway IP address that you want to use.
d) Under **NAMESERVER**, enter the IP address of the necessary DNS nameserver.

    You can click +**NAMESERVER** to enter IP addresses of additional nameservers.

e) Under **POOLS**, enter a range for the VIP network pool by specifying the **First IP** and **Last IP** that are within the Subnet CIDR specified above. The VIP network pool range enables us to prevent provisioning of tenant clusters with IP address ranges from overlapping subnets.

    The IP address for the Control Plane is also allocated from this network pool range.
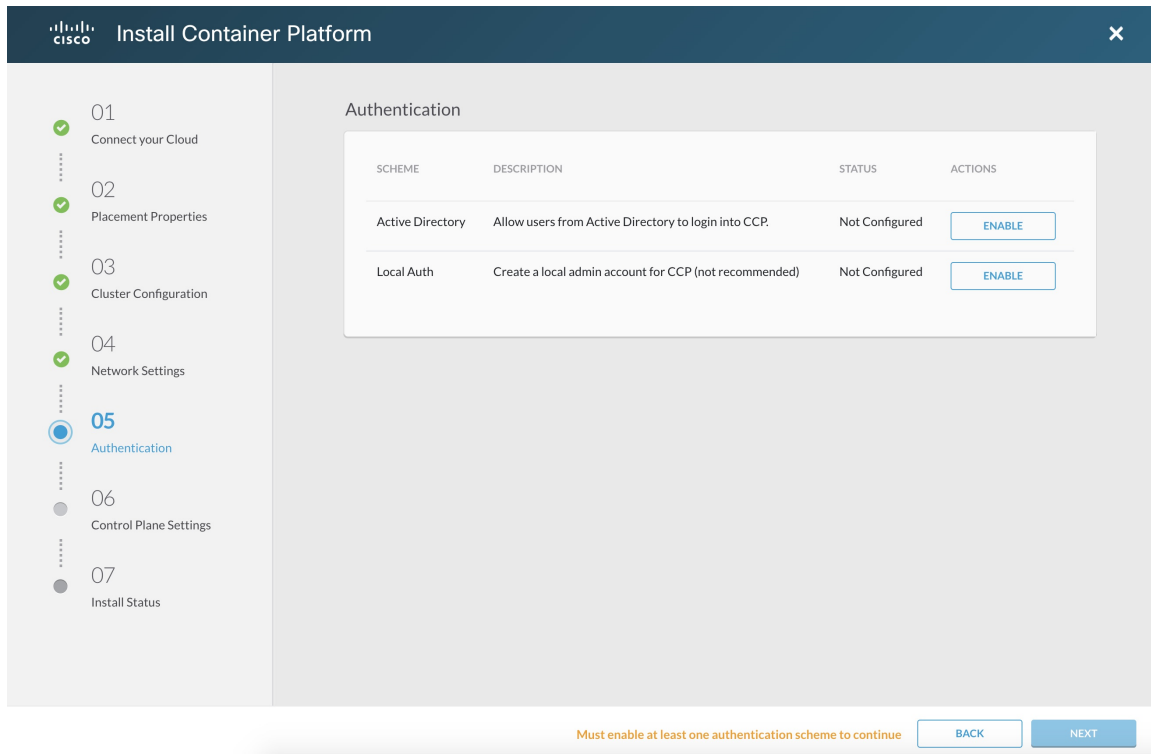
    You can click +**POOL** to enter multiple pools in the subnet.

    Note   You must ensure that these IP addresses are not part of a DHCP pool.

f) Click **SAVE**.

The **Authentication** screen appears.

Figure 10: Authentication Screen

Step 7   In the **Authentication** screen, click the **Enable** button next to the type of authentication that you want to configure.

Caution   Use of local authentication is not recommended and is considered less secure for production data.

a)   If you have enabled **Active Directory**, specify the following information in the **Active Directory** screen:

1.   Use the toggle button to enable or disable validation of Active Directory settings.

2.   In the **SERVER IP ADDRESS** field, enter the IP address of the AD server.

3.   In the **PORT** field, enter the port number for the AD server.

4.   To establish a secure connection using SSL/TLS, enable **STARTTLS**.

5.   To ensure security of your data, disable **SKIP CERTIFICATE VERIFICATION**.

Caution   If you enable **SKIP CERTIFICATE VERIFICATION**, TLS will accept any certificate presented by the AD server. In this mode, TLS is susceptible to data loss.

6.   In the **BASE DN** field, enter the LDAP query to select the AD group that contains the users who must be granted the **User** role.

For example:

CN=UserGroupName,OU=Folder,DC=example,DC=cisco,DC=com

Note   Base DN is the Distinguished Name for the base entity. All searches for users and groups will be scoped to this distinguished name.

7.   In the **ADMIN GROUP QUERY** field, enter the LDAP query to select the AD group that contains the users who must be granted the **Administrator** role.

For example:

CN=AdminGroupName,OU=Folder,DC=example,DC=cisco,DC=com

    8. In the **SERVICE ACCOUNT DN** field, enter the service account domain name that is used for accessing the LDAP server.

    9. In the **SERVICE ACCOUNT PASSPHRASE** field, enter the passphrase of the AD account.

    10. Click **SAVE**.

b) If you have enabled **Local** (not recommended), specify the following information in the **LOCAL AUTHENTICATION** screen:

    1. In the **LOCAL ADMIN USERNAME** field, enter the admin username.

    2. In the **LOCAL ADMIN PASSPHRASE** field, enter a passphrase.

    3. In the **CONFIRM LOCAL ADMIN PASSPHRASE** re-enter the admin passphrase.

    4. Click **SAVE**.

The **Control Plane Settings** screen appears.

Figure 11: Control Plane Settings Screen

Step 8 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) Expand **Advanced Settings**, in the **NTP SERVERS** field, enter the list of any NTP servers in your environment.

This field is optional.

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

Caution	After deploying Cisco Container Platform, do not change the location of the Control Plane VMs by modifying the datacenter or folder location **in vSphere**. Changing these settings will adversely impact the management of clusters.