



# Installing Cisco Open SDN Controller

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This chapter contains the following sections:

- [Installing Open SDN Controller—VMware ESXi, page 1](#)
- [Installing Open SDN Controller—Oracle VM VirtualBox, page 5](#)

## Installing Open SDN Controller—VMware ESXi

This procedure describes how to install Open SDN Controller on VMware ESXi hypervisors.

### Before You Begin

Note the following points before completing this procedure:

- Hostname resolution is recommended, but not required, for the installation. If you decide to make use of it, specify a fully qualified domain name either in the Deploy OVF Template wizard's Properties page or the `/etc/hosts` file.
- The config field in the Deploy OVF Template wizard's Properties page can safely be left blank.
- If you are setting up a 3-node cluster, you also need to complete Step 3 for the other 2 nodes in the cluster.
- When configuring Open SDN controller from the browser, use only its IP address in the address bar and configuration fields. Do not use its FQDN name.
- If you are using a multiple Network Interface Card (NIC) setup, have the IP addresses for the second and third NICs ready.
- Have values for the following controller settings ready:
  - IP address
  - Hostname
  - Netmask
  - Gateway address
  - DNS server addresses (recommended, but not mandatory)
  - NTP server address (recommended, but not mandatory)

You will need these for Step 3i.

### Step 1

Download a copy of the Open SDN Controller distribution file:

- a) Access the main Download Software page by opening the URL provided in the confirmation email you received after purchasing Open SDN Controller.
- b) If prompted, log into Cisco.com.  
If you don't already have a Cisco.com account, sign up for one [here](#).
- c) From the navigation pane, select **Products > Cloud and Systems Management > Network Controllers and Applications > Cisco Open SDN Controller > Cisco Open SDN Controller 1.1**.  
**Note** You may need to click an item more than once in order to view its sub-elements.
- d) From Open SDN Controller's Download Software page, locate osc-fcs-vmware.zip and click **Download**.
- e) Unzip the zip file to a local directory.  
Two files should now be available: the distribution file (osc-fcs-vmware.ova) and the documentation overview (which links to the documentation provided with this release).

### Step 2

Log in to your VMware vSphere client and import the OVA distribution.

### Step 3

Complete the Deploy OVF Template wizard:

- a) From the client's main menu, select **File > Deploy OVF Template**. The Deploy OVF Template wizard opens.
- b) Deploy OVF Template wizard  
Click **Browse** to navigate to the OVA distribution.
- c) Select the OVA distribution and then click **Open**.
- d) Click **Next**.  
From the OVF Template Details page, you can view information such as the corresponding product, vendor, and download size.
- e) Click **Next**.  
From the Name and Location page, you can specify the name and location of the template you are deploying.
- f) Click **Next**.  
From the Host/Cluster page, you can specify the host or cluster on which to run the template.
- g) Click **Next**.  
From the Disk Format page, you can select the format in which virtual disks are stored. We recommend that you choose the Thick Provision Lazy Zeroed option.
- h) Click **Next**.  
From the Network Mapping page, you can specify the networks that the deployed template will use and map every source network with the correct destination network. Although it is not mandatory, we recommend that you pair each source network with a unique destination network.
- i) Click **Next**.  
From the Properties page, you can customize the configuration settings for this deployment. At this point, you have two options:
  - You can leave this wizard page blank and move on to the last wizard page. See Step 3j.
  - You can enter the appropriate settings. Values must be entered for the following four fields:
    - ip\_0 (IP address): Note that you must specify an IPv4 address. IPv6 addresses are not supported.

- host\_fqdn (hostname)
- netmask\_0 (netmask)
- gateway\_0 (gateway address)

**Caution** If you fail to enter a value for any of these four fields, the installation will not complete successfully.

While they are not required, we recommend that you also enter values for the following fields:

- dns\_0 and dns\_1 (DNS server addresses)
- ntp (NTP server address)

j) Click **Next**.

From the Ready to Complete page, you can view a summary of all the settings you have specified in the wizard.

k) Click **Finish** to deploy the template. After a few minutes, a dialog box opens and indicates that the deployment has successfully completed.

l) Click **Close**.

#### Step 4

Determine the controller's IP address, which you will need for Step 5a:

- a) From your vSphere client's device list, right-click the controller's entry and then select **Open Console**.  
b) Log in to the controller as the sysadmin user with the following credentials:

- 1 login: sysadmin
- 2 password: sysadmin

At this point, you are prompted to configure a new password for the sysadmin user.

- c) Enter a new password for the admin user and then press the Enter key.  
The OS Configuration Console opens.
- d) Open the Network Settings page and note the value listed in the IP Address field.

#### Step 5

Complete the setup wizard:

- a) Open the following URL: `https://<controller's-IP-address>`  
The setup wizard's Cluster Configuration page opens.

- b) Configure the cluster that will run on the controller:

- 1 Select whether you want to create a one or three-node cluster.
- 2 Specify the nodes that belong to the cluster and then click **Next**.

Note the following:

- The first field is automatically populated with the IP address of the node you just accessed.
- If you select the three-node option, you will need to enter the IP addresses for the other two nodes you want to add to the cluster before proceeding.
- Open SDN Controller will validate every IP address you enter and indicate whether the address is reachable.

The setup wizard's Network Configuration page opens.

### 3 Do one of the following:

- Click **Back** to correct any errors you made when specifying the IP addresses of the cluster nodes.
- Click **Skip Multi-nic Config** to skip this wizard page and submit the API (Northbound) interface information you specified in the Cluster Configuration page.
- Enter the relevant device (Southbound) and controller-cluster (East-West) interface information and then click **Submit Network Config**.

Note the following:

- Open SDN Controller will use tooltips to indicate any invalid IP addresses you have entered, as well as any fields that require an IP address in order to complete the validation process.
- This button is available only after you have entered valid network configuration information.

After you click either the Skip Multi-nic Config or Submit Network Config button, the setup wizard's Configuration Status page opens:

- If configuration completes successfully (this typically takes about 5 minutes) and the authentication/login service starts, the setup wizard's Admin Account page opens. Proceed to Step 6.
- If configuration does not complete:
  - 1 Check ps.log (located in the /opt/cisco/platform/platform-services/data directory) to determine the errors that took place and make the necessary fixes.
  - 2 Establish an SSH connection with the controller's VM.
  - 3 Run the following command:
 

```
sudo vi /opt/cisco/platform/platform-services/data/node-config-state
```
  - 4 In the resulting file, set the state as Not Configured and then save the file.
  - 5 Refresh your browser to restart the setup wizard.
  - 6 Repeat Step 5b.

**Step 6** Enter a new passphrase for the admin user twice (the second time to confirm it) and then click **Change Passphrase**. Note the following:

- We recommend that you do not edit the value already set for the Current Passphrase field.
- Passwords must contain a minimum of 6 characters.
- After the password is changed, you are automatically directed to the Login page.

**Step 7** Log in to the controller, using the username **admin** and the password you just set. Note that the necessary Open SDN Controller plug-ins are installed automatically when you install the controller. To view all of the plug-ins that are available, select **Features** from the main toolbar's Management menu.

# Installing Open SDN Controller—Oracle VM VirtualBox

Complete the following procedure to install Open SDN Controller on a virtual machine using Oracle VM VirtualBox. When configuring Open SDN Controller from the browser, use only its IP address in the address bar and configuration fields. Do not use its FQDN name.

## Step 1

Download a copy of the Open SDN Controller distribution file:

- a) Access the main Download Software page by opening the URL provided in the confirmation email you received after purchasing Open SDN Controller.
- b) If prompted, log into Cisco.com.  
If you don't already have a Cisco.com account, sign up for one [here](#).
- c) From the navigation pane, select **Products > Cloud and Systems Management > Network Controllers and Applications > Cisco Open SDN Controller > Cisco Open SDN Controller 1.1**.  
**Note** You may need to click an item more than once in order to view its sub-elements.
- d) From Open SDN Controller's Download Software page, locate osc-fcs-virtualbox.zip and click **Download**.
- e) Unzip the zip file to a local directory.  
Two files should now be available: the distribution file (osc-fcs-virtualbox.ova) and the documentation overview (which links to the documentation provided with this release).

## Step 2

Create the virtual machine on which you will install the controller:

- a) Launch VirtualBox 4.3.x
- b) Select **File > Import Appliance**.
- c) Navigate to the distribution file you downloaded in Step 1, select it, and then click **Open**.  
The required OS, memory, and hard drive settings are automatically set.  
**Note** If you plan to use Open SDN Controller for development purposes only, you can lower the amount of memory allocated to the controller from 16 GB of ram to 8 GB.
- d) Click **Import**.

## Step 3

Specify the network settings necessary in order for the controller to operate properly on the virtual machine:

- a) Select the new virtual machine and then click **Settings** from the VirtualBox main menu.
- b) From the Settings menu, click **Network**.
- c) If necessary, select the Enable Network Adapter checkbox.
- d) From the Attached to: drop-down list, select **Bridged Adapter**.
- e) From the Name: drop-down list, select a wired network adapter.  
VirtualBox does not provide wireless support for bridged networking.

Note the following:

- If multiple network adapters are listed, select each adapter's tab and repeat Steps 3c through 3e.
  - If you plan to create a 3 node cluster in Step 8 of this procedure, complete Steps 3f through 3h. Otherwise, skip ahead to Step 4.
- f) Click **Advanced** to display additional network adapter options.
  - g) From the Adapter Type: drop-down list, select **Paravirtualized Network (virtio-net)**.

h) Click **OK**.

**Step 4** Start the virtual machine by doing one of the following:

- Select the virtual machine and then click **Start** from the VirtualBox main menu.
- Right-click the virtual machine and then select **Start**.

Once you start the virtual machine, it will automatically grab a DHCP address.

**Step 5** Log in to the controller as the sysadmin user with the following credentials:

- a) login:sysadmin
- b) password: sysadmin

At this point, you are prompted to configure a new password for the sysadmin user.

**Step 6** Enter a new password for the sysadmin user and then press the Enter key.  
The OS Configuration Console opens.

**Step 7** Determine the controller's IP address, which you will need for Step 8a:

- a) Select the **Drop to shell** option.
- b) Run the following command: **ifconfig eth0 | grep inet**
- c) Note the value listed for **inet addr**.

**Step 8** Complete the setup wizard:

- a) Open the following URL: <https://<controller's-IP-address>>  
The setup wizard's Cluster Configuration page opens.

- b) Configure the cluster that will run on the controller:

- 1 Select whether you want to create a one or three-node cluster.
- 2 Specify the nodes that belong to the cluster and then click **Next**.

Note the following:

- The first field is automatically populated with the IP address of the node you just accessed.
- If you select the three-node option, you will need to enter the IP addresses for the other two nodes you want to add to the cluster before proceeding.
- Open SDN Controller will validate every IP address you enter and indicate whether the address is reachable.

The setup wizard's Network Configuration page opens.

- 3 Do one of the following:

- Click **Back** to correct any errors you made when specifying the IP addresses of the cluster nodes.
- Click **Skip Multi-nic Config** to skip this wizard page and submit the API (Northbound) interface information you specified in the Cluster Configuration page.
- Enter the relevant device (Southbound) and controller-cluster (East-West) interface information and then click **Submit Network Config**.

Note the following:

- Open SDN Controller will use tooltips to indicate any invalid IP addresses you have entered, as well as any fields that require an IP address in order to complete the validation process.

- This button is available only after you have entered valid network configuration information.

After you click either the Skip Multi-nic Config or Submit Network Config button, the setup wizard's Configuration Status page opens:

- If configuration completes successfully (this typically takes about 5 minutes) and the authentication/login service starts, the setup wizard's Admin Account page opens. Proceed to Step 6.
- If configuration does not complete:
  - 1 Check ps.log (located in the /opt/cisco/platform/platform-services/data directory) to determine the errors that took place and make the necessary fixes.
  - 2 Establish an SSH connection with the controller's VM.
  - 3 Run the following command:  
**sudo vi /opt/cisco/platform/platform-services/data/node-config-state**
  - 4 In the resulting file, set the state as Not Configured and then save the file.
  - 5 Refresh your browser to restart the setup wizard.
  - 6 Repeat Step 5b.

**Step 9** Enter a new passphrase for the admin user twice (the second time to confirm it) and then click **Change Passphrase**. Note the following:

- We recommend that you do not edit the value already set for the Current Passphrase field.
- Passwords must contain a minimum of 6 characters.
- After the password is changed, you are automatically directed to the Login page.

**Step 10** Click the arrow at the top of the page to open the Admin Configuration page.

**Step 11** (Optional) Create a secondary admin user for the controller by entering the necessary information and then clicking **Create User**. You can skip this step by clicking **Skip User Creation**.

**Step 12** Click the arrow at the top of the page to complete cluster configuration and open the Cisco Open SDN controller login page.

**Step 13** Log in to the controller.

If you set up a secondary admin user, enter that user's credentials. Otherwise, enter the default admin user's credentials.

Note that the necessary Open SDN Controller plug-ins are installed automatically when you install the controller. To view all of the plug-ins that are available, select **Features** from the main toolbar's Management menu.

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