



Configuring Cisco APIC-EM in Standalone Mode

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Reviewing Cisco APIC-EM Configuration Wizard Parameters

When the Cisco APIC-EM configuration begins, an interactive wizard prompts you to enter information to configure the controller. The following table displays the information that you will be prompted for to complete the configuration.



Note Ensure that the DNS and NTP servers are reachable before you run the configuration wizard and whenever a Cisco APIC-EM host reboots in the deployment.

Table 1: Cisco APIC-EM Configuration Wizard Parameters

Configuration Wizard Prompt	Description	Example
(Optional) Bonded NICs	Choose to configure or not configure bonded NICs on the controller's interfaces. Enter 'yes' to proceed with configuring NIC bonding on the interfaces. Enter 'no' to bypass NIC bonding completely, and be presented with the option for VLAN configuration.	Enter 'yes'.

Configuration Wizard Prompt	Description	Example
Bonding mode	<p>If you chose to configure bonded NICs, then configure either 'balance-xor' or '802.3ad' for the bonded NICs.</p> <p>Entering 'balance-xor' will configure static bonding on the selected NICs. Entering '802.3ad' will configure LACP bonding on the selected NICs.</p> <p>Important Entering '802.3ad' requires that a separate LACP configuration be made on the switches that are connected to the Ethernet ports. Entering 'balance-xor' will require a configuration on the connected switches for the static configuration. Generally, this means that the appropriate ports be grouped together in a Cisco EtherChannel configuration for the static configuration. Refer to your Cisco switch documentation for information about configuring the switches. For this release, only one bonded interface with multiple NICs can be configured on the controller.</p>	Enter '802.3ad'.
(Optional) VLAN	<p>Choose to configure or not configure VLANs on the controller's interfaces.</p> <p>The NICs on the controller (whether an appliance, server, or virtual machine) can be configured with a VLAN interface. Both bonded NICs and standalone NICs can be configured with VLANs.</p> <p>The management interface of the appliance, server, or virtual machine can also be selected and configured with a VLAN interface.</p> <p>Note The same VLAN cannot be used on multiple interfaces.</p>	Enter 'yes' The VLAN range is limited (1-1001, 1005-4094).

Configuration Wizard Prompt	Description	Example
Host IP address	<p>Enter a host IP address.</p> <p>This IP address is used for the network adapter (eth0) on the host and connects to the external network or networks. For multiple network adapters, have several IP addresses available.</p> <p>Note This host IP address must be a valid IPv4 address.</p>	10.0.0.12
(Optional) Virtual IP address	<p>Enter a virtual IP address.</p> <p>This virtual IP address is used for the network adapter (eth0) on the host. You should only configure a virtual IP address, if you are setting up a multi-host deployment.</p> <p>Note The virtual IP address must be a valid IPv4 address.</p>	10.12.13.14
Netmask IP address	<p>Enter a netmask IP address.</p> <p>This must be a valid IPv4 netmask.</p>	255.255.255.0
Default Gateway IP address	<p>Enter a default gateway IP address.</p> <p>This must be a valid IPv4 address for the default gateway.</p>	10.12.13.1
Primary DNS server	<p>Enter a primary DNS server address.</p> <p>This must be a valid IPv4 address for the primary DNS server.</p>	<p>10.15.20.25</p> <p>Note Enter either a single IP address for a single primary server, or multiple IP addresses separated by spaces for DNS servers.</p>

Configuration Wizard Prompt	Description	Example
Primary NTP server	<p>Enter a primary NTP server address.</p> <p>This must be a valid IPv4 address or hostname of a Network Time Protocol (NTP) server.</p> <p>Note Before you deploy the Cisco APIC-EM, make sure that the time on the controller's system clock is current or that you are using a Network Time Protocol (NTP) server that is keeping the correct time.</p>	<p>10.12.13.10</p> <p>Enter either a single IP address for a single NTP primary server, or multiple IP addresses separated by spaces for several NTP servers. We recommend that you configure three NTP servers for your deployment.</p>
Add/Edit another NTP server	<p>This must be a valid NTP domain.</p>	<p>10.12.13.11</p> <p>Allows you to configure multiple NTP servers.</p> <p>Note We recommend that you configure three NTP servers for your deployment.</p>
(Optional) HTTPS proxy server	<p>Enter an HTTPS proxy server address.</p> <p>This must be a valid IPv4 address for the HTTPS proxy with port number.</p>	<p>https://209.165.200.11:3128</p>
Admin Username	<p>Enter the admin user name.</p> <p>Identifies the administrative username used for GUI access to the Cisco APIC-EM controller.</p> <p>We recommend that the username be three to eight characters in length and be composed of valid alphanumeric characters (A–Z, a–z, or 0–9).</p>	<p>admin2780</p>

Configuration Wizard Prompt	Description	Example
Admin Password	<p>Enter the admin password.</p> <p>Identifies the administrative password that is used for GUI access to the Cisco APIC-EM controller. You must create this password because there is no default. The password meet the following requirements:</p> <ul style="list-style-type: none">• Eight character minimum length.• Does NOT contain a tab or a line break.• Does contain characters from at least three of the following categories:<ul style="list-style-type: none">• Uppercase alphabet• Lowercase alphabet• Numeral• Special characters (for example, ! or #)	MyIseYPass2
Linux Username	<p>Enter a Linux username.</p> <p>Identifies the Linux (Grapevine) username used for CLI access to the Grapevine root and clients.</p>	The default is 'grapevine' and cannot be changed.

Configuration Wizard Prompt	Description	Example
Linux Password	<p>Enter a Linux password.</p> <p>Identifies the Linux (Grapevine) password that is used for CLI access to the Grapevine roots and clients. You must create this password because there is no default. The password meet the following requirements:</p> <ul style="list-style-type: none"> • Eight character minimum length. • Does NOT contain a tab or a line break. • Does contain characters from at least three of the following categories: <ul style="list-style-type: none"> • Uppercase alphabet • Lowercase alphabet • Numeral • Special characters (for example, ! or #) 	MyGVPass01

Configuring Cisco APIC-EM as a Single Host Using the Wizard

Perform the steps in the following procedure to configure Cisco APIC-EM as a single host using the wizard.

Before you begin

You must have either received the Cisco APIC-EM Controller Appliance with the Cisco APIC-EM pre-installed or you must have downloaded, verified, and installed the Cisco ISO image onto a server or virtual machine as described in the previous procedures.

Step 1 Boot up the host.

Step 2 Review the **APIC-EM License Agreement** screen that appears and choose either **<view license agreement>** to review the license agreement or **accept>>** to accept the license agreement and proceed.

Note You will not be able to proceed without accepting the license agreement.

After accepting the license agreement, you are then prompted to select a configuration option.

Step 3 Review the **Welcome to the APIC-EM Configuration Wizard!** screen and choose the **Create a new APIC-EM cluster** option to begin.

You are then prompted to enter 'yes' or 'no' for **RESET EXISTING CONTROLLER NETWORK CONFIG.**

- Step 4** Select the **Reset Networking Configuration** option for your configuration.
- For an initial deployment, enter 'no' and proceed with the configuration. For an upgrade for your deployment, enter 'yes' and proceed with the configuration
- Note** Entering 'yes' will remove the current networking configuration for the controller on this host.
- You are then prompted to enter values for the **NETWORK ADAPTER BONDING mode (OPTIONAL)**.
- Step 5** Select the **NETWORK ADAPTER BONDING mode (OPTIONAL)** for your configuration.
- Enter either 'yes' or 'no' for this step.
- Enter 'yes' to proceed with configuring NIC bonding on the interfaces (create a single logical port from two Ethernet ports (NICs) on the controller). Enter 'no' to bypass NIC bonding completely, and be presented with the option for VLAN configuration (see Step 7 below).
- After entering a value, click **next>>** to proceed.
- Step 6** If you entered 'yes', then enter the bonding mode in the **NETWORK ADAPTER 0 (bond0)** screen.
- Enter either 'balance-xor' or '802.3ad' for this step.
- This step permits you to create a single logical port from two or more Ethernet ports (NICs) on the controller that the configuration wizard discovers and displays. Entering 'balance-xor' will configure static bonding on the selected NICs. Entering '802.3ad' will configure LACP bonding on the selected NICs.
- For this release, only a single bonded interface with multiple NICs can be configured on the controller.
- Important** Entering '802.3ad' requires a separate LACP configuration be made on the switches that are connected to the Ethernet ports. Entering 'balance-xor' will require a configuration on the connected switches for the static configuration. Generally, this means that the appropriate ports be grouped together in a Cisco EtherChannel configuration for the static configuration. Refer to your Cisco switch documentation for information about configuring the switches.
- Step 7** Select the individual Ethernet ports (for example, eth0 and eth1) to bond together as a single logical port.
- Use the **Tab** key to navigate to the Ethernet port fields in the configuration wizard. Use the **space bar** to select (check) the Ethernet port.
- Note** When navigating to an Ethernet port, the configuration wizard displays the port's MAC address and speeds (in Mb/s). Both the actual and supported speeds are displayed. The actual speed is defined as the negotiated speed retrieved from the kernel itself (when the interface is down, 'NA' will be displayed). The supported speed is defined as the maximum speed supported by the NIC.
- When finished with this step, click **next>>** to proceed.
- Step 8** Select the **NETWORK ADAPTER VLAN Mode (Optional)**
- Enter either 'yes' or 'no' for this step.
- Entering 'yes' permits you to configure VLANs on the interface(s) in the next step. Entering 'no' bypasses VLAN configuration.
- Note** For a multi-host cluster, all the VLANs must be configured the same on each host.
- After entering a value, click **next>>** to proceed.

Step 9 (Optional) If you entered yes, then enter the management interface in the **ADD VIRTUAL NETWORK ADAPTERS** screen.

The management interface can be either an Ethernet port (bonded or not) or a VLAN. For a VLAN, use the following format:

interface.vlan_id

For example, **bond0.300** or **eth0.300**

Step 10 (Optional) Add virtual adapters for each of the interfaces in the **ADD VIRTUAL NETWORK ADAPTERS** screen.

If you created a bonded port in the previous steps, then that bonded port will be displayed in this screen. Navigate to the bonded port displayed on the screen using the **Tab** key on your keyboard. Proceed to configure one or more VLANs on the bonded port.

If you did not create a bonded port in the previous steps, then each Ethernet port discovered by the configuration wizard will be displayed in this screen. Navigate to the Ethernet ports displayed on the screen using the **Tab** key on your keyboard. Proceed to configure one or more VLANs on these Ethernet ports.

Note You can use a comma separated list of VLANs (for example, 100, 200, 300) for this step. The VLAN range is limited (1-1001, 1005-4094). The same VLAN cannot be used on multiple interfaces. Up to 5 VLANs can be configured per Cisco APIC-EM cluster.

Click **next>>** to proceed.

Step 11 Enter configuration values for the **NETWORK ADAPTER #1** on the host.

The configuration wizard discovers and prompts you to confirm values for the network adapter or adapters on your host. For example, if your host has three network adapters you are prompted to confirm configuration values for network adapter #1 (eth0), network adapter #2 (eth1), and network adapter #3 (eth2) respectively.

Note The step header changes to reflect your prior configuration selections. For example, if you configured a bonded NIC, then the header will display **NETWORK ADAPTER #1 (bond0)**, if you configured this bonded NIC as the management interface, then the header will display **NETWORK ADAPTER #1 (bond0) MANAGEMENT INT**, and so forth.

Important The primary interface for the controller is eth0 and it is best practice to ensure that this interface is made highly available.

On Cisco UCS servers, the NIC labeled with number 1 would be the physical NIC. The NIC labeled with the number 2 would be eth1.

Host IP address	<p>Enter the host IP address to use for the network adapter. This host IP address (and network adapter) connects to the external network or networks.</p> <p>These external network(s) consists of the network devices, NTP servers, as well as providing access to the northbound REST APIs. The external network(s) also provides access to the controller GUI.</p> <p>Note The configuration wizard validates the value entered and issues an error message if incorrect. If you receive an error message for the host IP address, then check to ensure that eth0 (ethernet interface) is connected to the correct network adapter.</p>
Virtual IP	<p>(Optional) Enter a virtual IP address to use for this network adapter. You should only configure a virtual IP address, if you are setting up a multi-host deployment.</p> <p>Note For additional information about virtual IP, see Multi-Host Deployment Virtual IP</p>
Netmask	<p>Enter the netmask for the network adapter's IP address.</p>
Default Gateway IP address	<p>Enter a default gateway IP address to use for the network adapter.</p> <p>Note If no other routes match the traffic, traffic will be routed through this IP address.</p>
DNS Servers	<p>Enter the DNS server or servers IP addresses (separated by spaces) for the network adapter.</p>
Static Routes	<p>If required for your network, enter a space separated list of static routes in this format: <network>/<netmask>/<gateway></p> <p>Static routes, which define explicit paths between two routers, cannot be automatically updated; you must manually reconfigure static routes when network changes occur. You should use static routes in environments where network traffic is predictable and where the network design is simple. You should not use static routes in large, constantly changing networks because static routes cannot react to network changes.</p>

Once satisfied with the controller network adapter settings, enter **next>>** to proceed. After entering **next>>**, the configuration wizard proceeds to validate the values you entered. After validation and if your host has two network adapters, you are prompted to enter values for **NETWORK ADAPTER #2 (eth1)**. If your host has three network adapters, you are prompted to enter values for **NETWORK ADAPTER #2 (eth1)** and **NETWORK ADAPTER #3 (eth2)**. If you do not have any additional network adapters or if you do not have more than one non-routable network, then proceed directly to the next step.

Step 12 If the controller is being deployed in your network behind a proxy server and the controller's access to the Internet is through this proxy server, then enter configuration values for the **HTTPS PROXY**.

Note If there is no proxy server between the controller and access to the Internet, then this step will not appear. Instead, you will be prompted to enter values for **CLOUD CONNECTIVITY**. Additionally, if the **HTTPS PROXY** step appears because the Gateway is unreachable for a short period of time due to network delay, then you can choose **Next** and skip back to the **HTTPS PROXY** step.

HTTPS Proxy	Enter the protocol (HTTP or HTTPS), IP address, and port number of the proxy. For example, enter https://209.165.200.11:3128
HTTPS Proxy Username	Enter the username, if authentication is required for the proxy.
HTTPS Proxy Password	Enter the password, if authentication is required for the proxy.

After configuring the **HTTPS PROXY**, enter **next>>** to proceed. After entering **next>>**, you are then prompted to enter values for **CLOUD CONNECTIVITY**.

Step 13 Enter configuration values for **CLOUD CONNECTIVITY**.

CCO Username	Enter a Cisco Connection Online (CCO) username for cloud connectivity. For example, enter the username that you use to log into the Cisco website to access restricted locations as either a Cisco customer or partner. Note If you don't have a CCO username and password or if you don't want access to cisco.com from your APIC-EM installation, then fill out the Username and Password fields with any information, but ensure that you do not include spaces in the username. This will permit you to proceed through the config-wizard process. Values entered for this field are used for telemetry collection. For information about telemetry collection, see the <i>Cisco Application Policy Infrastructure Controller Enterprise Module Administrators Guide</i> .
CCO Password	Enter a Cisco Connection Online (CCO) password for the CCO <i>username</i> . For example, enter the password that you use to log into the Cisco website to access restricted locations as either a Cisco customer or partner.
Company Name	Enter the company or organization's name with which you are affiliated.

Once satisfied with the cloud connectivity settings, enter **next>>** to proceed. After entering **next>>**, the configuration wizard proceeds to validate the values entered. After validation, you are then prompted to enter values for the **LINUX USER SETTINGS**.

Step 14 Enter configuration values for the **LINUX USER SETTINGS**.

Linux Password	<p>Enter a Linux password.</p> <p>The Linux password is used to ensure security for both the Grapevine root and clients located on the host (appliance, server, or virtual machine). Access to the Grapevine root and clients by you or the controller requires this password.</p> <p>The default username is grapevine.</p> <p>For information about the requirements for a Linux password, see the Password Requirements section in Chapter 2, Securing the Cisco APIC-EM in the <i>Cisco Application Policy Infrastructure Controller Enterprise Module Administrator Guide</i>.</p> <p>Note The Linux password is encrypted and hashed in the controller database.</p>
Re-enter Linux Password	Confirm the Linux password by entering it a second time.
Seed Phrase Password Generation	<p>(Optional) Instead of creating and entering your own password in the above Linux Password fields, you can enter a seed phrase and have the configuration wizard generate a random and secure password using that seed phrase.</p> <p>Enter a seed phrase and then press <Generate Password> to generate the password.</p>
Auto Generated Password	<p>(Optional) The seed phrase appears as part of a random and secure password. If desired, you can either use this password "as is", or you can further edit this auto generated password.</p> <p>Note When finished with the password, be sure to save it to a secure location for future reference.</p> <p>Press <Use Generated Password> to save the password.</p>

After configuring the Linux password, enter **next>>** to proceed. After entering **next>>**, you are then prompted to enter values for the **APIC-EM ADMIN USER SETTINGS**.

Step 15 Enter configuration values for the **APIC-EM ADMIN USER SETTINGS**.

Administrator Username	<p>Enter an administrator username.</p> <p>Your administrator username and password are used to ensure security for the controller itself. Access to the controller's GUI requires that you enter this username and password.</p>
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Administrator Password	<p>Enter an administrator password.</p> <p>For information about the requirements for an administrator password, see the Password Requirements section in Chapter 2, Securing the Cisco APIC-EM in the <i>Cisco Application Policy Infrastructure Controller Enterprise Module Administrator Guide</i>.</p> <p>Note The administrator password is encrypted and hashed in the controller database.</p>
Re-enter Administrator Password	<p>Confirm the administrator password by entering it a second time.</p>
Seed Phrase Password Generation	<p>(Optional) Instead of creating and entering your own password in the above Administrator Password fields, you can enter a seed phrase and have the configuration wizard generate a random and secure password using that seed phrase.</p> <p>Enter a seed phrase and then press <Generate Password> to generate the password.</p>
Auto Generated Password	<p>(Optional) The seed phrase appears as part of a random and secure password. If desired, you can either use this password "as is", or you can further edit this auto generated password.</p> <p>Note When finished with the password, be sure to save it to a secure location for future reference.</p> <p>Press <Use Generated Password> to save the password.</p>

After configuring the administrator password, enter **next>>** to proceed.

After entering **next>>**, you are then prompted to enter values for either the **NTP SERVER SETTINGS**.

Step 16

Enter configuration values for **NTP SERVER SETTINGS**.

NTP servers	<p>Enter a single NTP server address or a list of NTP servers each separated by a space.</p> <p>The Elastic Services Platform (Grapevine) manages a Network Time Protocol (NTP) server to provide time synchronization for the Grapevine clients. You must configure the NTP server for the clients. The NTP server is external to the cluster.</p> <p>Note We recommend that for redundancy purposes, you configure at least three NTP servers for your Cisco APIC-EM deployment.</p>
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Note Cisco routers can also be configured as NTP servers.

After configuring the NTP server(s), enter **next>>** to proceed. After entering **next>>**, you are then prompted to enter values for **INTER-HOST COMMUNICATION**.

Step 17 Enter configuration values for **INTER-HOST COMMUNICATION**.

Enable IPsec Encryption	You can configure IPsec tunneling for communications between the hosts in a multi-host cluster. By selecting <i>yes</i> , you configure IPsec tunneling. The default is IPsec and the default option is set to <i>yes</i> .
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Once satisfied with the inter-host communication setting, enter **next>>** to proceed. After entering **next>>**, the configuration wizard proceeds to validate the values you entered.

Step 18 Enter configuration values for **CONTROLLER CLEAN-UP**.

Harvest All Virtual Disks	Entering <i>yes</i> will delete all Grapevine virtual disks that belong to the controller for this specific deployment. For an initial configuration, enter no .
Delete All Clients	Entering <i>yes</i> will delete all Grapevine clients that belong to the controller for this specific deployment. For an initial configuration, enter no .

For an initial configuration, enter **no** for both options.

After configuring the controller clean-up, enter **next>>** to proceed. After entering **next>>**, you are then prompted to enter values to finish the configuration and begin the configuration wizard installation.

Step 19 A final message appears stating that the wizard is now ready to proceed with applying the configuration.

The following options are available:

- **[back]**—Review and verify your configuration settings.
- **[cancel]**—Discard your configuration settings and exit the configuration wizard.
- **[save & exit]**—Save your configuration settings and exit the configuration wizard.
- **[proceed]**—Save your configuration settings and begin applying them.

Enter **proceed>>** to complete the installation. After entering **proceed>>**, the configuration wizard applies the configuration values that you entered above.

At the end of the configuration process, a **CONFIGURATION SUCCEEDED!** message appears.

Step 20 Open your browser and enter the host IP address to access the Cisco APIC-EM GUI.

You can use the displayed IP address of the Cisco APIC-EM GUI at the end of the configuration process.

Step 21 After entering the IP address in the browser, a message stating that "Your connection is not private" appears.

Ignore the message and click the **Advanced** link.

Step 22 After clicking the **Advanced** link, a message stating that the site's security certificate is not trusted appears.

Ignore the message and click the link.

Note This message appears because the controller uses a self-signed certificate. You will have the option to upload a trusted certificate using the controller GUI after installation completes.

Step 23 In the **Login** window, enter the administrator username and password that you configured above and click the **Log In** button.

What to do next

Start to use the Cisco APIC-EM to manage and configure your network. For assistance with navigating the controller's GUI and becoming familiar with its features, use the *Cisco APIC-EM Quick Start Guide*.

If you are deploying a multi-host configuration, then review the following multi-host configuration procedure.



Note You can send feedback about the Cisco APIC-EM by clicking the Feedback icon ("I wish this page would...") at the lower right of each window in the GUI. Clicking on this icon opens an email. Use this email to send a comment on the current window or to send a request to the Cisco APIC-EM development team.

Managing Admin Accounts

Admin User Right Differences

The usernames and passwords that you configure by using the Cisco APIC-EM configuration wizard are intended to be used for administrative access to the Cisco APIC-EM Grapevine root (Linux) and the Cisco APIC-EM GUI interface.

The administrator that has access to the Cisco APIC-EM Grapevine root is called the Linux admin user. By default, the username for the Linux admin user is 'grapevine' and the password is user-defined during the configuration wizard setup process. There is no default password.

Both the username and password for the Cisco APIC-EM GUI is user-defined during the configuration wizard process. There is no default username or password.

The Cisco APIC-EM Linux admin user has different rights and capabilities than the Cisco APIC-EM GUI-based admin user and can perform other administrative tasks.

Tasks Performed by Linux (Grapevine) Admin Users

The following tasks can be performed by the Linux (Grapevine) admin user:

- Displaying audit and system logs on the Cisco APIC-EM.
- Reviewing the status of Cisco APIC-EM services on the appliance.
- Resetting the configuration values back to their original configuration settings.
- Restoring the Cisco APIC-EM back to the factory default.
- Creating a support file that you can then email to Cisco support for assistance.

- Updating or changing your Cisco APIC-EM configuration wizard settings (for example, updating the NTP configuration settings).

GUI-based admin users that are created by using the Cisco APIC-EM user interface cannot automatically log into the Cisco APIC-EM and access the Grapevine root and clients located on the appliance. Only Linux admin users can access the Cisco APIC-EM Grapevine root and clients on the appliance.



Note See the *Cisco Application Policy Infrastructure Controller Enterprise Module Troubleshooting Guide* for information about the supported Grapevine root (Linux) commands and accessible logs.

Tasks Performed by GUI Admin Users

The following tasks can be performed by the GUI admin user:

- Initiate and work with the base applications (Discovery, Inventory, Topology, Path Trace, and EasyQoS) and solution applications (Network PnP and iWAN).
- Back up and restore the Cisco APIC-EM database and files.
- Display the service logs on the Cisco APIC-EM.
- Apply Cisco APIC-EM software patches, maintenance releases, and upgrades.



Note See the following for detailed information about the above supported controller GUI operations:

- *Cisco Application Policy Infrastructure Controller Enterprise Module Administrator Guide*

Creating GUI Admin Users

For first-time GUI-based access to Cisco APIC-EM system, the administrator username and password is configured during the configuration wizard setup.

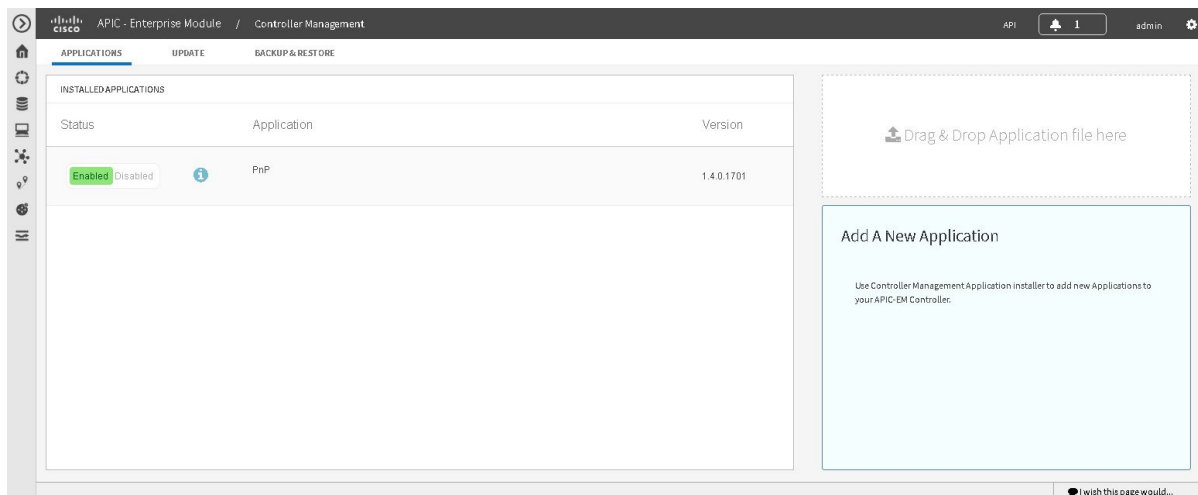


Note You can add GUI admin users through the GUI interface itself. See the *Cisco Application Policy Infrastructure Controller Enterprise Module Administrator Guide* for more information.

Installing Cisco APIC-EM Applications

The application installation procedure is simple, the application bundle provided by Cisco must be dropped in the browser window under **admin** (Settings Icon) in **App Management**.

Figure 1: App Management Window



Perform the following procedure to install additional applications.



Important

Perform this procedure only after you have completed your Cisco APIC-EM configuration. If you are setting up a multi-host Cisco APIC-EM configuration, then perform this procedure when finished setting up all of the hosts in your multi-host configuration.

Before you begin

You have installed Cisco APIC-EM, following the procedures described in this guide.

You must have administrator (ROLE_ADMIN) permissions and either access to all resources (RBAC scope set to ALL) or an RBAC scope that contains all of the resources that you want to group. For example, to create a group containing a specific set of resources, you must have access to those resources (custom RBAC scope set to all of the resources that you want to group).

For information about user permissions and RBAC scopes required to perform tasks using the Cisco APIC-EM, see "User Settings" in the chapter, "Configuring the Cisco APIC-EM Settings" in the *Cisco Application Policy Infrastructure Controller Enterprise Module Administrator Guide*.

- Step 1** Download the application bundle or bundles from Cisco.com.
Save the bundle or bundles to a secure location on your laptop or network.
- Step 2** In your browser address bar, enter the IP address of the Cisco APIC-EM in the following format:
https://IP address
- Step 3** On the launch page, enter your username and password.
The **Home** window of the APIC-EM controller now appears.
- Step 4** In the **Home** window, click either **admin** or the **Settings** icon (gear) at the top right corner of the screen.
- Step 5** Click the **App Management** link from the drop-down menu.

Step 6 Drag and drop the application bundle onto the dedicated drag and drop field of the **App Management** window on the browser.

Note This step initiates the application installation process which can take several minutes to complete

Step 7 Once the application is uploaded and installed, toggle the switch next to the application's name to enable it.

What to do next

If needed for your network deployment, repeat the above steps to upload, install, and enable another application.

Powering Down and Powering Up a Single-Host or Multi-Host Cluster

Under certain circumstances such as troubleshooting, you might want to gracefully power down and then power up either a single-host or an entire multi-host cluster. This procedure describes how to perform these procedures.

For information about powering down and powering up only a single host within a multi-host cluster, see [Powering Down and Powering Up a Single Host Within a Multi-Host Cluster](#).

Before you begin

You should have installed the Cisco APIC-EM following the procedures in this guide.

Step 1 Using a Secure Shell (SSH) client, log into the host (appliance, server, or virtual machine) with the IP address that you specified using the configuration wizard.

Note The IP address to enter for the SSH client is the IP address that you configured for the network adapter. This IP address connects the host to the external network.

Step 2 When prompted, enter your Linux username ('grapevine') and password for SSH access.

Step 3 Enter the **harvest_all_clients** command to harvest (gracefully shut down) all services on a single host or on multiple hosts within a multi-host cluster.

```
$ sudo /home/grapevine/bin/harvest_all_clients
```

Important For a multi-host cluster, you only need to enter this command on one of the hosts to harvest (gracefully shut down) all services on all of hosts in the cluster.

Step 4 Review the command output and subsequent directions.

```
$ sudo /home/grapevine/bin/harvest_all_clients
```

```
Disabled Grapevine policy
Harvesting client 1f481f49-fabc-44f9-af5a-0481bd823165...
Harvesting client 6dac3f56-fb05-4fd0-be06-d5c6869e23cd...
Harvesting client c800924c-7603-4092-b1f8-0c19f5141acc...
```

Powering Down and Powering Up a Single-Host or Multi-Host Cluster

```
Waiting on task 05b9192c-9484-11e6-bdc2-0050569f3bee...
Task '05b9192c-9484-11e6-bdc2-0050569f3bee' completed successfully
Waiting on task 05da80da-9484-11e6-bdc2-0050569f3bee...
Task '05da80da-9484-11e6-bdc2-0050569f3bee' completed successfully
```

Successfully harvested all clients

PLEASE NOTE:

Grapevine policy has been DISABLED so that services and clients can be harvested.
To start all services again, run the following command:

```
grape config update enable_policy true
```

Step 5 Power down the host, by entering the following command:

```
$ sudo shutdown -h now
```

Enter your password a second time when prompted.

For a multi-host cluster, you will need to enter this command on each of the hosts in the multi-host cluster to shut them all down.

Important You need to ensure that the last host that was shutdown in a multi-host cluster is the very first host that is then restarted. Be sure to track the order in which the hosts are shutdown in a multi-host cluster.

Step 6 Review the command output as the host shuts down.

Note The `sudo shutdown` command also powers off the host.

Step 7 Power up the Grapevine root process by turning the host or hosts (in a multi-host cluster) back on.

Important For a multi-host cluster, be sure to restart the host that was shutdown last in the multi-host cluster. This must be the first host restarted.

Step 8 Using a Secure Shell (SSH) client, log back into the host with the IP address that you specified using the configuration wizard.

Note The IP address to enter for the SSH client is the IP address that you configured for the network adapter. This IP address connects the host to the external network.

Step 9 When prompted, enter your Linux username ('grapevine') and password for SSH access.

Step 10 Enable Grapevine, by entering the following command on the Grapevine root:

```
$ grape config update enable_policy true
```

Wait a few minutes for the Cisco APIC-EM services to start up again.

Important For a multi-host cluster, you only need to enter this command on one of the hosts after all of the hosts have been successfully powered on.

What to do next

Log back into the controller's GUI and begin working with the Cisco APIC-EM to manage and monitor the devices within your network.

Uninstalling the Cisco APIC-EM

The following procedure describes how to uninstall the Cisco APIC-EM.



Note If you plan to reinstall the Cisco APIC-EM after uninstalling it, then you must follow the procedure described below to avoid any possible problems. You should have also contacted Cisco support for the link to download the latest Cisco APIC-EM ISO image. Be aware that this procedure shuts down both the Cisco APIC-EM and the host (physical or virtual) on which it resides. At the end of this procedure and if you are reinstalling the Cisco APIC-EM, then you will need to access the host and restart it.

Step 1 Using a Secure Shell (SSH) client, log into the host (appliance, server, or virtual machine) with the IP address that you specified using the configuration wizard.

Note The IP address to enter for the SSH client is the IP address that you configured for the network adapter. This IP address connects the appliance to the external network.

Step 2 Enter the Linux username ('grapevine') and password when prompted.

Step 3 Enter the **reset_grapevine factory** command at the prompt.

```
$ reset_grapevine factory
```

Step 4 Enter your Linux grapevine password a second time to start the reset process.

```
$ sudo password for grapevine *****
```

After entering this command a warning appears that the **reset_grapevine factory** command will shut down the controller. You are then prompted to confirm your intent to run the **reset_grapevine factory** command.

Step 5 Enter **Yes** to confirm that you want to run the **reset_grapevine factory** command.

The controller then performs the following tasks:

- Stops all running clients and services
- Stops and shuts down any Linux containers
- Deletes all cluster data
- Deletes all user data
- Deletes the configuration files including secrets and private keys
- Shuts down the controller

- Shuts down the host (physical or virtual)
-