



## Using the Command-Line Interface

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This chapter provides helpful tips for understanding and configuring the Cisco Evolved Programmable Network Manager (EPNM) from the command-line interface (CLI). The Cisco EPNM can be deployed for small, medium, and large deployments and is available on different platforms and also as a software that can run on VMware.

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## Before Accessing the Cisco EPNM CLI

Before logging in to the Cisco EPNM CLI, ensure that you have completed the installation tasks as specified in the *Cisco EPNM Installation Guide* at : <https://www.cisco.com/c/en/us/support/cloud-systems-management/evolved-programmable-network-epn-manager/products-installation-guides-list.html>.

# Running the Setup Utility to Configure the Appliance

When you power on the Cisco EPNM appliances for the first time, you are prompted to run the setup utility to configure the Cisco EPNM appliances. Before you run the utility using the **setup** command, ensure that you have values for the following network configuration prompts:

- Hostname
- IP address
- Netmask
- Gateway
- Domain
- Nameserver
- Network Time Protocol (NTP) server (optional)
- User ID
- Password

The following is a sample output from the **setup** command:

```
*****
Please type 'setup' to configure the appliance
*****
localhost login: setup
Press 'Ctrl-C' to abort setup
Enter hostname[: epnm-33-aws-100
Enter IP address[10.126.168.100]:
Enter IP default netmask[: 255.255.255.0
Enter IP default gateway[: 10.126.168.1
Enter default DNS domain[: cisco.com
Enter primary nameserver[: 72.163.128.140
Add/Edit another nameserver? Y/N : n
Enter primary NTP server[time.nist.gov]: 10.81.254.202
Add/Edit secondary NTP server? Y/N : n
Enter system timezone[UTC]: Asia/Calcutta
Current system clock time : 2018-11-27 07:59:14 IST
Change system clock time? Y/N : n
Enter username[admin]:
Enter password:
Enter password again:
*****
* High Availability (HA) Role Selection *
*****
HA refers to a system that is continuously operating during failure.
To configure HA, go to the primary server's user interface.
Choose Administration > High Availability > HA Configuration.
For more information, click the context-sensitive online help.
Will this server be used as a Secondary for HA? (yes/no) : no
*****
* Web Interface Root Password Selection *
*****
Expected :
```

```
* Cisco EPNM Setup *
```

```

Enter "^" to return to previous question.

*****
* Advanced Security Selection *
*****
Do you want to allow access to root shell? (yes/no) :yes

*****
* Web Interface Root Password Selection *
*****
Enter Web Interface - root password:
Enter Web Interface - root password again:

*****
* Summary *
*****
Server will not be a Secondary
Root shell will be enabled.
Web Interface - root password is set.
Apply these settings? (y/n)y
Settings Applied.

```

After you enter the required information, the Cisco EPNM appliance automatically reboots and the following login prompt appears:

```
machine_name login:
```

where *machine\_name* identifies the hostname that you specified when you ran the **setup** command.

In this example, this prompt appears:

```
NCS login:
```

To log in, use the administrator user account (and the corresponding password) that you created during the setup process. You must also use this Admin account to log in to the Cisco EPNM CLI for the first time. After accessing the CLI as an administrator, you can create more users (with admin and operator privileges) with SSH access to the CLI by running the **username** command in configuration mode.




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**Note** The administrator user account and the corresponding password (a CLI user account) that you created during the initial setup wizard can be used to manage the Cisco EPNM application using the CLI. The CLI user has privileges to start and stop the Cisco EPNM application software, backup, and restore the Cisco EPNM application data, apply software patches and upgrades to the Cisco EPNM application software, view all the system and the application logs, and reload or shut down the Cisco EPNM appliance. To protect the CLI user credentials, explicitly create users with access to the CLI.

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**Note** Any users that you create from the Cisco EPNM web interface cannot automatically log in to the Cisco EPNM CLI. You must explicitly create users with access to the CLI. To create these users, you must log in to the CLI using the Admin account that you created during setup; then, enter configuration mode, and run the **username** command.

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# Accessing the Cisco EPNM CLI

Before logging in to the Cisco EPNM CLI, ensure that you have completed the hardware installation and configuration process outlined in the [Before Accessing the Cisco EPNM CLI, on page 2](#)

To log in to the Cisco EPNM server and access the CLI, use an SSH secure shell client or the console port. You can log in from:

- A PC running Windows 7, 8, and 10.
- A PC running Linux.
- An Apple computer running Mac OS X 10.4 or later.
- Any terminal device compatible with VT100 or ANSI characteristics. On the VT100-type and ANSI devices, you can use cursor-control and cursor-movement key. Keys include left arrow, up arrow, down arrow, right arrow, Delete, and Backspace. The CLI senses the use of the cursor-control keys and automatically uses the optimal device characteristics.

To exit the CLI, use the **exit** command from EXEC mode. If you are currently in one of the configuration modes and you want to exit the CLI, enter the **end**, **exit**, or press **Ctrl z** command to return to EXEC mode, and then enter the **exit** command.

## Opening CLI with Secure Shell



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**Note** To access the Cisco EPNM CLI environment, use any SSH client that supports SSH v2.

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The following example shows you how to log in with a Secure Shell (SSH) client (connection to a wired WAN) via a PC by using Windows XP. Assuming that Cisco EPNM is preconfigured through the setup utility to accept an Admin (administrator) user, log in as Admin.

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**Step 1** Use any SSH client and start an SSH session.

The SSH window appears.

**Step 2** Press **Enter** or **Spacebar** to connect.

The Connection to Remote Host window appears.

**Step 3** Enter a hostname, username, port number, and authentication method.

In this example, you enter **ncs** for the hostname, **admin** for the username, and **22** for the port number; and, for the authentication method, choose **Password** from the drop-down list.

**Step 4** Click **Connect**, or press **Enter**.

The Enter Password window appears.

**Step 5** Enter your assigned password for the administrator.

The SSH with the Add Profile window appears.

**Step 6** (Optional) Enter a profile name in the text box and click **Add to Profile**.

**Step 7** Click **Close** in the Add Profile window.

The Cisco EPNM command prompt appears. You can now enter Cisco EPNM CLI commands.

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## Opening CLI Using a Local PC

If you need to configure Cisco EPNM locally (without connecting to a wired LAN), you can connect a PC to the console port on the Cisco EPNM appliance using a null-modem cable.

The serial console connector (port) provides access to CLI locally by connecting a terminal to the console port. The terminal is a PC running terminal-emulation software or an ASCII terminal. The console port (EIA/TIA-232 asynchronous) requires only a null-modem cable.

To connect a PC running terminal-emulation software to the console port, use a DB-9 female to DB-9 female null-modem cable.

To connect an ASCII terminal to the console port, use a DB-9 female to DB-25 male straight-through cable with a DB-25 female to DB-25 female gender changer.

The default parameters for the console port are 9600 baud, 8 data bits, no parity, 1 stop bit, and no hardware flow control.



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**Note** If you are using a Cisco switch on the other side of the connection, set the switchport to duplex auto, speed auto (the default).

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**Step 1** Connect a null-modem cable to the console port on the Cisco EPNM and to the COM port on your PC.

**Step 2** Set up a terminal emulator to communicate with the Cisco EPNM. Use these settings for the terminal emulator connection: 9600 baud, 8 data bits, no parity, 1 stop bit, and no flow control.

**Step 3** When the terminal emulator activates, press **Enter**.

**Step 4** At the console, enter your username, then press **Enter**.

**Step 5** Enter the password, then press **Enter**.

When CLI activates, you can enter the CLI commands to configure the Cisco EPNM.

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# Understanding Command Modes

This section describes the Cisco EPNM command modes in detail.

## EXEC Mode

When you start a session on the Cisco EPNM, you begin in admin or EXEC mode. From EXEC mode, you can enter configuration mode. Most of the EXEC commands (one-time commands), such as **show** commands, display the current configuration status. The admin or EXEC mode prompt consists of the device name or hostname before a pound sign (#), as shown:

```
ncs/admin# (Admin or EXEC mode)
```

You can always tell when you are in EXEC mode or configuration mode by looking at the prompt.

- In EXEC mode, a pound sign (#) appears after the NCS server hostname and your username.

For example:

```
ncs/admin#
```

- In configuration mode, the 'config' keyword and a pound sign (#) appear after the hostname of the Cisco EPNM server and your username.

For example:

```
ncs/admin# configure
Enter configuration commands, one per line. End with CNTL/Z.
ncs/admin(config)# (configuration mode)
```

If you are familiar with UNIX, you can equate EXEC mode to *root* access. You could also equate it to the administrator level in Windows NT or the supervisor in NetWare. In this mode, you have permission to access everything in the Cisco EPNM server, including the configuration commands. However, you cannot enter configuration commands directly. Before you can change the actual configuration of the Cisco EPNM server, you must enter configuration mode by entering the **configure** or **configure terminal (conf t)** command. Enter this command only when in EXEC mode.

For example:

```
ncs/admin# conf t
Enter configuration commands, one per line. End with CNTL-Z.
ncs(config)# (configuration mode)
```

The configuration mode has several submodes; each has its own prompt. To enter these submodes, you must first enter configuration mode by entering the **configure terminal** command.

To exit configuration mode, enter the **end**, **exit**, or **Ctrl-z** command. To exit EXEC mode, enter the **exit** command. To exit both configuration and EXEC modes, enter this sequence of commands:

```
ncs/admin(config)# exit
ncs/admin# exit
```

To obtain a listing of commands in EXEC mode, enter a question mark (?):

```
ncs/admin# ?
```

## Configuration Mode

Use configuration mode to make changes to the existing configuration. When you save the configuration, these commands remain across Cisco EPNM server reboots, but only if you run either of these commands:

- **copy running-config startup-config**
- **write memory**

To enter configuration mode, run the **configure** or **configure terminal (conf t)** command in EXEC mode. When in configuration mode, the Cisco EPNM expects configuration commands.

For example:

```
ncs/admin# configure
Enter configuration commands, one per line. End with CNTL-Z.
ncs/admin(config)# (configuration mode)
```

From this level, you can enter commands directly into the Cisco EPNM configuration. To obtain a listing of commands in this mode, enter a question mark (?):

```
ncs/admin(config)# ?
```

The configuration mode has several configuration submodes. Each of these submodes places you deeper in the prompt hierarchy. When you enter the **exit** command, the Cisco EPNM returns you to the previous level. When you enter the **exit** command again, the Cisco EPNM backs you out to the EXEC level.




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**Note** In configuration mode, you can alternatively press the **Ctrl-z** instead of entering the **end** or **exit** command.

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## Configuration Submodes

In the configuration submodes, you can enter commands for specific configurations. For example:

```
ncs/admin# config t
ncs/admin(config)# interface GigabitEthernet 0
ncs/admin(config-GigabitEthernet)#
```

To obtain a list of commands in this mode, enter a question mark (?):

```
ncs/admin(config-GigabitEthernet)# ?
```

Use the **exit** or **end** command to exit this prompt and return to the configuration prompt.

The following table lists the commands in the interface GigabitEthernet 0 configuration submode. Other configuration submodes exist including those specific to the **kron**, **repository**, and **password policy** commands.



**Table 1: Command Options in the Interface GigabitEthernet 0 Configuration Submode**

	Comment
<pre>ncs/admin(config)# interface GigabitEthernet 0 ncs/admin(config-GigabitEthernet)# ? Configure ethernet interface: do          EXEC command end        Exit from configure mode exit      Exit from this submode ip        Configure IP features ipv6     Configure IPv6 features no        Negate a command or set its defaults shutdown  Shutdown the interface virtual-ip Configure virtual IP features ncs/admin(config-GigabitEthernet)#</pre>	<p>Enter the command that you want to configure for the interface. This example uses the <b>interface GigabitEthernet</b> command.</p> <p>Enter ? to display what you must enter next on the command line. This example shows the available <b>interface GigabitEthernet</b> configuration submode commands.</p>
<pre>ncs/admin(config-GigabitEthernet)# ip ? access-group Specify access control for packets address      Configure IP address ncs/admin(config-GigabitEthernet)# ip</pre>	<p>Enter the command that you want to configure for the interface. This example uses the <b>ip</b> command.</p> <p>Enter ? to display what you must enter next on the command line. This example shows the available <b>ip</b> configuration submode commands.</p>
<pre>ncs/admin(config-GigabitEthernet)# ip address ? &lt;A.B.C.D&gt; IPv4 address ncs/admin(config-GigabitEthernet) ip address</pre>	<p>Enter the command that you want to configure for the interface. This example uses the <b>ip address</b> command.</p> <p>Enter ? to display what you must enter next on the command line. In this example, you must enter an IPv4 address.</p> <p>A carriage return &lt;cr&gt; does not appear; therefore, you must enter additional arguments to complete the command.</p>
<pre>ncs/admin(config-GigabitEthernet)# ip address 172.16.0.1 ? &lt;A.B.C.D&gt; Network mask ncs/admin(config-GigabitEthernet)# ip address 172.16.0.1</pre>	<p>Enter the keyword or argument that you want to use. This example uses the 172.16.0.1 IP address.</p> <p>Enter ? to display what you must enter next on the command line. In this example, you must enter a network mask.</p> <p>A carriage return &lt;cr&gt; does not display; therefore, you must enter additional arguments to complete the command.</p>
<pre>ncs/admin(config-GigabitEthernet)# ip address 172.16.0.1 255.255.255.224 ? &lt;cr&gt; Carriage Return ncs/admin(config-GigabitEthernet)# ip address 172.16.0.1 255.255.255.224 ?</pre>	<p>Enter the network mask. This example uses the 255.255.255.224 IP address.</p> <p>Enter ? to display what you must enter next on the command line. In this example, you can press <b>Enter</b>.</p> <p>A carriage return &lt;cr&gt; displays; you can press <b>Enter</b> to complete the command.</p>

# Navigating the CLI Commands

This section describes how to navigate the commands and modes on the Cisco EPNM

## Getting Help

Use the question mark (?) and the arrow keys to help you enter commands:

- For a list of available commands, enter a question mark (?):

```
ncs/admin# ?
```

- To complete a command, enter a few known characters before ? (with no space):

```
ncs/admin# s?
```

- To display keywords and arguments for a command, enter ? at the prompt or after entering part of a command followed by a space:

```
ncs/admin# show ?
```

The Cisco EPNM displays a list and brief description of available keywords and arguments.



**Note** The <cr> symbol in command help stands for “carriage return”, which means to press the **Return** or the **Enter** key). The <cr> at the end of command help output indicates that you have the option to press **Enter** to complete the command and that the arguments and keywords in the list preceding the <cr> symbol are optional. The <cr> symbol by itself indicates that no more arguments or keywords are available, and that you must press **Enter** to complete the command.

- To redisplay a command that you previously entered, press the **Up Arrow** key. Continue to press the **Up Arrow** key to see more commands.

## Using the No and Default Forms of Commands

Some EXEC or configuration commands have a **no** form. In general, use the **no** form to disable a function. Use the command without the **no** keyword to re-enable a disabled function or to enable a function disabled by default; for example, an IP address enabled by default. To disable the IP address, use the **no ip address** command; to re-enable the IP address, use the **ip address** command.

Configuration commands can also have a **default** form, which returns the command settings to the default values. Most commands disabled by default, so in such cases using the **default** form has the same result as using the **no** form of the command. However, some commands are enabled by default and have variables set to certain default values. In these cases, the **default** form of the command enables the command and sets the variables to their default values.

See [Configuration Commands](#) for a description of the complete syntax of the configuration commands, and the **no** and **default** forms of a command.

## Command-Line Conventions

This section contains some basic command-line convention and operation information that is essential to the use of this guide.

### Command-Line Editing Key Conventions

The Cisco EPNM provides a number of keyboard shortcuts that you can use to edit an entered line.

#### Tab

Press **Tab** to try to finish the current command.

If you press the **Tab** key:

- At the beginning of a line, the system lists all of the short-form options.
- When you enter a partial command, the system lists all of the short form options beginning with those characters.
- When only one possible option is available, the system fills in the option automatically.

#### Ctrl-c

Press **Ctrl-c** to abort the sequence. Pressing this key sequence breaks out of any executing command and returns to the previous mode.

#### Ctrl-z

Press **Ctrl-z** to exit configuration mode and return to previous configuration mode.

#### ?

Enter a question mark (?) at the prompt to list the available commands.

## Command Line Completion

Command-line completion makes the Cisco EPNM CLI more user-friendly. It saves you extra key strokes and helps out when you cannot remember the syntax of a command.

For example, for the **show running-config** command:

```
ncs/admin# show running-config
```

You can:

```
ncs/admin# sh run
```

The Cisco EPNM expands the command **sh run** to **show running-config**.

Another shortcut is to press the **Tab** key after you type **sh**; the Cisco EPNM CLI fills in the rest of the command, in this case **show**.

If the Cisco NCS CLI does not understand a command, it repeats the entire command line and places a caret symbol (^) under the point at which it is unable to parse the command.

For example:

```
ncs/admin# show unning-configuration
                ^
% Invalid input detected at '^' marker.
```

The caret symbol (^) points to the first letter in the command line that the Cisco EPNM does not understand. Usually, this means that you need to provide additional arguments to complete the command or you misspelled the command. In this case, you omitted the “r” in the “unning” command. To fix the error, retype the command.

In another form of command-line completion, you can start a command by entering the first few characters, then pressing the **Tab** key. As long as you can match one command, the Cisco EPNM CLI will complete the command. For example, if you type **sh** and press **Tab**, the Cisco EPNM completes the **sh** with **show**. If the Cisco EPNM does not complete the command, you can enter a few more letters and press **Tab** again.

## Continuing Output at the --More-- Prompt

When working with the CLI, output often extends beyond the visible screen length. For cases where output continues beyond the bottom of the screen, such as with the output of many **?** or **show** commands, the output pauses and a --More-- prompt appears at the bottom of the screen. To resume output, press **Return** to scroll down one line, or press the **spacebar** to display the next full screen of output.



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**Tip** If the output pauses on your screen but you do not see the --More-- prompt, try entering a smaller value for the screen length by using the **terminal length** EXEC command. Command output will not pause if you set the length value to zero (0).

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## Where to Go Next

Now that you are familiar with some of the Cisco EPNM CLI basics, you can begin to configure the Cisco EPNM using CLI.

Remember that:

- You can use the question mark (?) and arrow keys to help you enter commands.
- Each command mode restricts you to a set of commands. If you have difficulty entering a command, check the prompt and then enter the question mark (?) to see a list of available commands.
- To disable a feature, enter the keyword **no** before the command; for example, **no ip address**.
- You must save your configuration changes so that you preserve them during a system reload or power outage.

