



CHAPTER 3

Command Line Interface

This chapter describes how to use the NME-APA module Command-Line Interface (CLI), its hierarchical structure, authorization levels and its help features. The Command-Line Interface is one of the NME-APA module management interfaces.

The CLI is accessed through a Telnet. When you enter a Telnet session, you enter as the simplest level of user, in the User Exec mode.

The NME-APA module supports up to five concurrent CLI sessions.

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Getting Help

To obtain a list of commands that are available for each command mode, enter a question mark (?) at the system prompt. You also can obtain a list of keywords and arguments associated with any command using the context-sensitive help feature.

The following table lists commands you can enter to get help that is specific to a command mode, a command, a keyword, or an argument.

Table 3-1 **Getting Help**

Command	Purpose
abbreviated-command-entry?	Obtain a list of commands that begin with a particular character string. (Do not leave a space between the command and question mark.)
abbreviated-command-entry<Tab>	Complete a partial command name.

Table 3-1 *Getting Help (continued)*

Command	Purpose
?	List all commands available for a particular command mode
command?	List the keywords associated with the specified command.
command keyword?	List the arguments associated with the specified keyword. Leave a space between the keyword and question mark

Authorization and Command Levels (Hierarchy)

When using the CLI there are two important concepts that you must understand to navigate:

- **Authorization Level**—Indicates the level of commands you can execute. A user with a simple authorization level can only view some information in the system, while a higher level administrator can actually make changes to configuration.

This manual documents commands at all authorization levels. See [CLI Authorization Levels, page 3-11](#)

- **Command Hierarchy Level**—Provides you with a context for initiating commands. Commands are broken down into categories and you can only execute each command within the context of its category. For example, to configure parameters related to the Line Card, you need to be within the LineCard Interface Configuration Mode. See [CLI Command Hierarchy, page 3-2](#)

The following sections describe the available Authorization and Command Hierarchy Levels and how to maneuver within them.

The on-screen prompt indicates both your authorization level and your command hierarchy level, as well as the assigned host name. See [Prompt Indications, page 3-5](#).



Note

Throughout the manual, NME-APA is used as the sample host name.

CLI Command Hierarchy

The set of all CLI commands is grouped in hierarchical order, according to the type of the commands. The first two levels in the hierarchy are the User Exec and Privileged Exec modes. These are non-configuration modes in which the set of available commands enables the monitoring of the NME-APA module, file system operations, and other operations that cannot alter the configuration of the NME-APA module.

The next levels in the hierarchy are the Global and Interface configuration modes, which hold a set of commands that control the global configuration of the NME-APA module and its interfaces. Any of the parameters set by the commands in these modes should be saved in the startup configuration, such that in the case of a reboot, the NME-APA module restores the saved configuration.

The following table shows the available CLI modes.

Table 3-2 CLI Modes

Mode	Description	Level	Prompt indication
User Exec	Initial mode. Also allows monitoring of the system (show commands).	User/Viewer	NME-APA >
Privileged Exec	General administration; file system manipulations and control of basic parameters that do not change the configuration of the NME-APA platform.	Admin/ Root	NME-APA #
Global Configuration	Configuration of general system parameters, such as DNS, host name, and time zone.	Admin/ Root	NME-APA (config)#
Interface Configuration	Configuration of specific system interface parameters, such as the Line Card, and the Ethernet interfaces.	Admin/ Root	NME-APA (config if)#
Line Configuration	Configuration of Telnet lines.	Admin/ Root	NME-APA (config-line)#

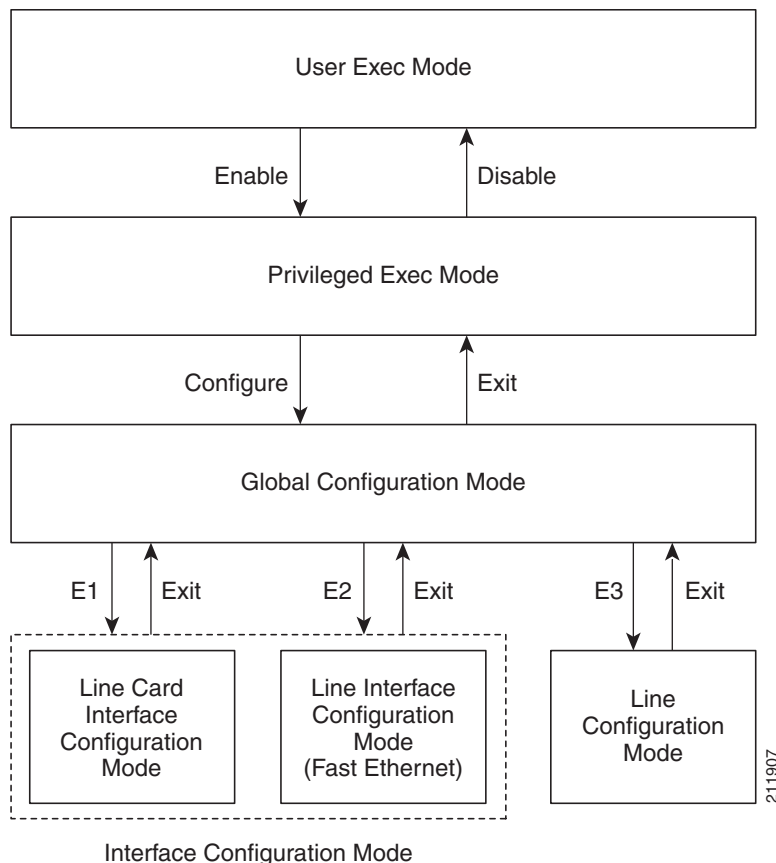
When you login to the system, you have the User authorization level and enter User Exec mode. Changing the authorization level to Viewer does not change the mode. Changing the authorization level to Admin automatically moves you to Privileged Exec mode. To move to any of the configuration modes, you must enter commands specific to that mode.

A Telnet session begins with a request for password, and will not continue until the proper user password is supplied. This enhances the security of the system by not revealing its identity to unauthorized people.

The list of available commands in each mode can be viewed using the question mark '?' at the end of the prompt.

Figure 3-1 illustrates the hierarchical structure of the CLI modes, and the CLI commands used to enter and exit a mode.

Figure 3-1 CLI Command Modes



The following commands are used to enter the different configure interface modes and the Line Configuration Mode:

E1 **interface LineCard 0**

E2 **interface FastEthernet 0/1**, or **0/2** (line ports, NME-APA module)

E3 **line vty 0**



Note

Although the system supports up to five concurrent Telnet connections, you cannot configure them separately. This means that any number you enter in the **line vty** command (**0, 1, 2, 3** or **4**) acts as a **0** and configures all five connections together.



Note

In order for the auto-completion feature to work, when you move from one interface configuration mode to another, you must first exit the current interface configuration mode (as illustrated in the above figure).

Example:

This example illustrates moving into and out of configuration modes as follows:

- Enter global configuration mode
- Configure the NME-APA module time zone

- Enter the LineCard Interface configuration
- Define the link mode
- Exit LineCard Interface configuration mode to the global configuration mode
- Exit global configuration mode

```
NME-APA#configure
NME-APA(config)#clock timezone PST -10
NME-APA(config)#interface LineCard 0
NME-APA(config if)#link mode port1-port2 forwarding
NME-APA(config if)#exit
NME-APA(config)#exit
NME-APA#
```

Prompt Indications

The on-screen prompt indicates your authorization level, your command hierarchy level, and the assigned host name. The structure of the prompt is:

<hostname (mode-indication) level-indication>

Authorization levels are indicated as follows:

This prompt...	Indicates this...
>	indicates User and Viewer levels
#	indicates Admin level
#>	indicates Root level

Command hierarchy levels are indicated as follows:

This command hierarchy...	Is indicated as...
User Exec	NME-APA>
Privileged Exec	NME-APA#
Global Configuration	NME-APA (config)#
Interface Configuration	NME-APA (config if)#
Line Configuration	NME-APA (config-line)#

Example:

The prompt *NME-APA1(config if)#* indicates:

- The name of the NME-APA platform is NME-APA 1
- The current CLI mode is Interface configuration mode
- The user has Admin authorization level

CLI Help Features

CLI provides context sensitive help. Two types of context sensitive help are supported:

- Partial help

- Argument help

Partial Help

To obtain a list of commands that begin with a particular character string, enter the abbreviated command entry immediately followed by a question mark (?). This form of help is called partial help, because it lists only the keywords or arguments that begin with the abbreviation you entered.

Example:

The following example illustrates how typing **c?** displays all available arguments that start with the letter c.

```
NME-APA(config)#snmp-server c?
Communitycontact
NME-APA(config)#snmp-server c
```

Argument Help

To obtain a list of command’s associated keywords or parameters, type a question mark (?) in place of a keyword or parameter on the command line.

Note that if <Enter> is acceptable input, the symbol <cr> represents the Enter key.

Example:

The following example illustrates how to get a list of all arguments or keywords expected after the command **snmp-server** .

```
NME-APA(config)#snmp-server ?
CommunityDefine community string
ContactSet system contact
Enable Enable the SNMP agent
Host Set traps destination
LocationSet system location
NME-APA(config)# snmp-server
```

When asking for help on a particular parameter, the system informs you of the type of data that is an accepted legal value. The types of parameters supported are:

STRING	When a String is expected, you can enter any set of characters or digits. If the string has a space as one of its characters, use double-quote (“”) marks to enclose the string.
DECIMAL	Any decimal number. Positive number is assumed, for negative numbers use the “-” symbol.
HEX	A hexadecimal number; must start with either 0x or 0X.

Example:

The following example illustrates the use of ? to get help on commands syntax. In this example, you can enter either the word **running-config**, or any name of a file, after the word **copy**.

```
NME-APA#copy ?
  running-config Copy running configuration file
running-config-all Copy all running configuration files
running-config-application Copy running application configuration file
```

```

startup-config      Backup the startup-config to a specified destination
                   STRING
                   Source file name
NME-APA#copy

```

[no] Prefix

Many CLI commands offer the option of adding the word **no** before the command to disable the feature controlled by the command or revert it to its default configuration. This notation is shown in the *Cisco Network Module Enhanced Application Performance Assurance CLI Command Reference* as **[no]** to denote it is optional.

For example, **no service telnetd** disables the Telnet server. Enabling the Telnet server is done by typing **service telnetd**.

Navigational and Shortcut Features

- [Command History, page 3-7](#)
- [Keyboard Shortcuts, page 3-7](#)
- [Tab Completion, page 3-8](#)
- [FTP User Name and Password, page 3-9](#)

Command History

CLI maintains a history buffer of the most recent commands you used in the current CLI session for quick retrieval. Using the keyboard, you can navigate through your last commands, one by one, or all commands that start with a given prefix. By default, the system saves the last 30 commands you typed. You can change the number of commands remembered using the **history size** command.

To use the history functions, use the keys shown in [Table 3-3](#).

Table 3-3 Keyboard Shortcuts for History Functions

Arrow	Shortcut	Description
Up arrow	Ctrl-P	Move cursor to the previous command with the same prefix.
Down arrow	Ctrl-N	Moves the cursor to the next command with the same prefix as original.
	Ctrl-L Ctrl-R	Re-display the current command line.

Keyboard Shortcuts

The NME-APA platform has several keyboard shortcuts that make it easier to navigate and use the system. The following table shows the keyboard shortcuts available.

You can get a display the keyboard shortcuts at any time by typing help bindings.

Table 3-4 **Keyboard Shortcuts**

Description	Shortcut key
Navigational shortcuts	
Move cursor one character to the right.	CTRL-F /->
Move cursor one character to the left.	CTRL-B /<-
Move cursor one word to the right (forward).	ESC-F
Move cursor one word to the left (backward).	ESC-B
Move cursor to the start of the line.	CTRL-A
Move cursor to the end of the line.	CTRL-E
Editing shortcuts	
Delete the character where the cursor is located.	CTRL-D
Delete from the cursor position to the end of the word.	ESC-d
Delete the character before the current location of the cursor.	Backspace
Delete the character before the current location of the cursor.	CTRL-H
Deletes from the cursor position to the end of the line	CTRL-K
Deletes all characters from the cursor to the beginning of the line	CTRL-U
Deletes all characters from the cursor to the beginning of the line. (Same functionality as CTRL-U.)	CTRL-X
Delete the word to the left of the cursor.	CTRL-W
Recall the last item deleted.	CTRL-Y
Completes the word when there is only one possible completion.	<Tab>
Completes the word when there is only one possible completion. (Same functionality as <Tab>.)	CTRL-I

Tab Completion

The CLI interface features tab completion. When you type in the first letters of a command and type <Tab>, the system automatically fills in the rest of the command or keyword. This feature works only when there is one command that could be possible using the starting letters.

Example:

The letters **snm** followed by
<Tab>

will be completed to the command **snmp-server**.

```
NME-APA(config)#snm <Tab>
NME-APA(config)#snmp-server
```

If you type <Enter> instead of <Tab>, and there is no ambiguity, the system actually carries out the command which would be filled in by the rest of the word.

Example:

The following example displays how the system completes a partial (unique) command for the **enable** command. Because **enable** does not require any parameters, the system simply carries out the **enable** command when the user presses Enter.

```
NME-APA>en<Enter>
Password:
NME-APA#
```

FTP User Name and Password

CLI enables saving ftp user name and password to be used in FTP operations—download and upload, per session.

These settings are effective during the current CLI session.

The following example illustrates how to set FTP password and user name and the use in these settings for getting a file named *config.tmp* from a remote station using FTP protocol.

```
NME-APA#ip ftp password vk
NME-APA#ip ftp username vk
NME-APA#copy ftp://@10.1.1.253/h:/config.tmp myconf.txt
connecting 10.1.1.253 (user name vk password vk) to retrieve config.tmp
NME-APA#
```

Managing Command Output

Some commands, such as many show commands, may have many lines of output. There are several ways of managing the command output:

- Scrolling options—When the command output is too large to be displayed all at once, you can control whether the display scrolls line by line or refreshes the entire screen.
- Filtering options—You can filter the output so that output lines are displayed only if they include or exclude a specified expression.
- Redirecting to a file—You can send the output to a specified file.

Note that by default, the show commands act the same as the more commands; that is, the output is displayed interactively a single screen at a time. Use the no more (on page) command to disable this feature so that show commands display the complete output all at one time.

- [Scrolling the Screen Display, page 3-10](#)
- [Filtering Command Output, page 3-10](#)
- [Redirecting Command Output to a File, page 3-10](#)

Scrolling the Screen Display

The output of some **show** and **dir** commands is quite lengthy and cannot all be displayed on the screen at one time. Commands with many lines of output are displayed in chunks of 24 lines. You can choose to scroll the display line by line or refresh the entire screen. At the prompt after any line, you can type one of the following keys for the desired action:

- <Enter>
 - Show one more line
- <Space>
 - Show 24 more lines (a new chunk)
- <g>
 - Stop prompting for more
- <?>
 - Display a help string showing possible options
- Any other key- Quit showing the file

Filtering Command Output

You can filter the output of certain commands, such as **show**, **more**, and **dir**, so that output lines are displayed only if they include or exclude a specified expression. The filtering options are as follows:

- **include**—Shows all lines that include the specified text.
- **exclude**—Does not show any lines that include the specified text.
- **begin**—Finds the first line that includes the specified text, and shows all lines starting from that line. All previous lines are excluded.

The syntax of filtered commands is as follows:

- <command> | include <expression>
- <command> | exclude <expression>
- <command> | begin <expression>

Following is an example of how to filter the **show version** command to display only the last part of the output, beginning with the version information.

```
NME-APA# show version | include version
```

Redirecting Command Output to a File

You can redirect the output of commands, such as **show**, **more**, and **dir**, to a file. When writing the output of these commands to a file, you can specify either of the following options:

- **redirect**—The new output of the command will overwrite the existing contents of the file.
- **append**—The new output of the command will be appended to the existing contents of the file.

The syntax of redirection commands is as follows:

- <command> | redirect <file-name>
- <command> | append <file-name>

Following is an example of how to do the following:

- Filter the more command to display from a csv user file only the gold package users.
- Redirect that output to a file named `current_gold_users`. The output should not overwrite existing entries in the file, but should be appended to the end of the file.

```
NME-APA# more users_10.10.2004 | include gold append current_gold_users
```

CLI Authorization Levels

The NME-APA platform has four authorization levels, which represent the user access permissions. When you initially connect to the NME-APA platform, you automatically have the most basic authorization level, that is User, which allows minimum functionality.

To monitor the system, you must have Viewer authorization, while to perform administrative functions on the NME-APA platform, you must have Admin or Root authorization. A higher level of authorization is accessed by logging in with appropriate password, as described in the procedures below.

In each authorization level, all the commands of the lower authorization layers are available in addition to commands that are authorized only to the current level.

The following CLI commands are related to authorization levels:

- **enable**
- **disable**

Each authorization level has a value (number) corresponding to it. When using the CLI commands, use the values, not the name of the level, as shown in [Table 3-5](#).

Table 3-5 Authorization Levels

Level	Description	Value	Prompt
User	Password required. This level enables basic operational functionality.	0	>
Viewer	Password required. This level enables monitoring functionality. All show commands are available to the Viewer authorization level, with the exception of those that display password information.	5	>

Table 3-5 Authorization Levels (continued)

Level	Description	Value	Prompt
Admin	Password required. For use by general administrators, the Admin authorization level enables configuration and management of the NME-APA platform.	10	#
Root	Password required. For use by technical field engineers, the Root authorization level enables configuration of all advanced settings, such as debug and disaster recovery. The Root level is used by technical engineers only.	15	#>

Changing from User to Viewer Level Authorization

A Telnet session begins with a request for password, and will not continue until the proper user password is supplied. This enhances the security of the system by not revealing its identity to unauthorized people.

-
- Step 1** From the NME-APA> prompt, type **enable 5** and press Enter.
The system prompts for a password by showing the prompt *Password:*
 - Step 2** Type in the password for the Viewer level and press Enter.
Note that the password is an access-level authorization setting, not an individual user password.
The system prompt NME-APA> does not change when you move from User to Viewer level.
-

Logging in with Root Level Authorization

-
- Step 1** Initiate a Telnet connection.
 - Step 2** A Password: prompt appears. Type in the user level password and press Enter.
The NME-APA> prompt appears.
You now have user level authorization.
 - Step 3** From the NME-APA> prompt, type **enable 15** and press Enter.
The system prompts for a password by showing the prompt Password:
 - Step 4** Type in the password for the Root level and press Enter.

Note that the password is an access-level authorization setting, not an individual user password. The system prompt changes to NME-APA#> to show you are now in Root level.

This example illustrates how to change the authorization level from User to Root, and then revert back to Admin. No password is required for moving to a lower authorization level.

```
NME-APA>enable 15
Password: <Cisco>
NME-APA#>disable
NME-APA#
```

Exiting Modes

This section describes how to revert to a previous mode.

- To exit from one authorization level to the previous one, use the **disable** command.
- To exit from one mode to another with the Admin authorization level (these are the various configuration modes), use the **exit** command.

Exiting from Privileged Exec Mode and Reverting to Viewer Mode

-
- Step 1** At the NME-APA# prompt, type **disable**, and press **Enter**.
The NME-APA> prompt for the Viewer and User Exec mode appears.
-

Exiting from Global Configuration Mode

-
- Step 1** At the NME-APA (config)# prompt, type **exit**, and press **Enter**.
The appropriate prompt for the previous level appears.
-

Example:

This example illustrates how to change the authorization level from User to Root, and then revert back to Admin. No password is required for moving to a lower authorization level.

```
NME-APA(config if)#exit
NME-APA(config)#
```

Navigating Between Configuration Modes

- [Entering and Exiting Global Configuration Mode, page 3-14](#)
- [Interface Configuration Modes, page 3-14](#)

Entering and Exiting Global Configuration Mode

- [Entering Global Configuration Mode, page 3-14](#)
- [Exiting Global Configuration Mode, page 3-14](#)

Entering Global Configuration Mode

-
- Step 1** At the NME-APA# prompt, type **configure**, and press Enter.
The NME-APA (config)# prompt appears.
-

Exiting Global Configuration Mode

-
- Step 1** At the NME-APA# prompt, type **exit**, and press Enter.
The NME-APA# prompt appears.
-

Interface Configuration Modes

The components that are configured by the Interface Configuration Modes are:

- Card
 - LineCard—**Interface LineCard 0**
- Ports
 - [Configuring the Physical Ports, page 3-14](#)
- Telnet
 - Line Configuration Mode—**Line vty 0**

The Line Configuration Mode enables you to configure Telnet parameters.

Configuring the Physical Ports

The NME-APA platform contains the following physical port interfaces:

- Fast Ethernet:
 - Interface FastEthernet 0/1 or 0/2**

The FastEthernet Interface mode configures the settings for the FastEthernet interface to the Internet traffic on the wire. Each of the two ports can be set individually.

The following commands are used to configure the Fast Ethernet line ports:

- bandwidth
- queue

**Note**

You must specify the slot number and interface number when referencing any interface. The slot number is always 0, and the interfaces are numbered as follows:
Ethernet Line Interfaces: **1,2**

Entering LineCard Interface Configuration Mode

The following procedure is for entering Line Card Interface Configuration mode. The procedures for entering the other interfaces are the same except for the interface command as described above.

-
- Step 1** To enter Global Configuration Mode, at the NME-APA# prompt, type **configure** and press Enter.
The NME-APA(config)# prompt appears.
- Step 2** Type **interface LineCard 0** and press Enter.
The NME-APA(config if)# prompt appears.
- Step 3** To return to Global Configuration Mode, type **exit** and press Enter.
The NME-APA(config)# prompt appears.
- Step 4** To exit Global Configuration Mode, type **exit** and press Enter.
-

Entering Ethernet Line Interface Configuration Mode

-
- Step 1** To enter Global Configuration Mode, at the NME-APA# prompt, type **configure** and press Enter.
The NME-APA(config)# prompt appears.
- Step 2** Type interface **FastEthernet [0/1/0/2]** and press Enter.
The NME-APA(config if)# prompt appears.
-

The following example shows how to enter Configuration Mode for the FastEthernet Interface number 1.

```
NME-APA (config) #interface FastEthernet 0/1
NME-APA (config if) #
```

Navigating from One Interface Configuration Mode to Another

-
- Step 1** Type **Exit**.
You are returned to the Global Configuration Mode.
- Step 2** Type the appropriate command to enter a different Interface Configuration Mode.
-

do Command: Executing Commands Without Exiting

There are three configuration command modes:

- Global configuration mode
- Interface configuration mode
- Line configuration mode

When you are in one of these configuration modes, it is possible to execute an EXEC mode command (such as a **show** command) or a privileged EXEC (such as **show running-config**) without exiting to the relevant command mode. Use the 'do' command for this purpose.

-
- Step 1** At the NME-APA(config)# (or NME-APA(config if)#) prompt, type **do <command>**.
The specified command executes without exiting to the appropriate exec command mode.
-

The following example shows how to display the running configuration while in interface configuration mode.

```
NME-APA(config if#) do show running-config
```

Creating a CLI Script

The CLI scripts feature allows you to record several CLI commands together as a script and play it back. This is useful for saving repeatable sequence of commands, such as software upgrade. For example, if you are configuring a group of NME-APA modules and you want to run the same configuration commands on each platform, you could create a script on one platform and run it on all the other NME-APA modules. The available script commands are:

- script capture
- script stop
- script print
- script run

-
- Step 1** At the NME-APA# prompt, type **script capture sample1.scr** where *sample1.scr* is the name of the script.
Step 2 Perform the actions you want to be included in the script.
Step 3 Type **script stop**.
The system saves the script.
-

The following is an example of recording a script for defining users.

```
NME-APA#script capture users.scr
NME-APA#configure
NME-APA(config)#username John privilege 15 password BfgVxsm
NME-APA(config)#username Kathy privilege 10 password MuiyioP
NME-APA(config)#aaa authentication login default local enable
NME-APA(config)#exit
NME-APA#copy running-config startup-config
Writing general configuration file to temporary location...
Backing-up general configuration file...
Copy temporary file to final location...
NME-APA#script stop
NME-APA#
```