CHAPTER **2**

Command-Line Interface

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Introduction

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

The CLI is accessed through a Telnet session or directly via the console port on the front panel of the Cisco SCE platform. When you enter a Telnet session, you enter as the simplest level of user, in the User Exec mode.

The Cisco SCE platform supports up to eleven concurrent CLI sessions; five sessions initiated by Telnet connection, five sessions via SSH connection, and one session on the console port. This chapter contains the following information:

Authorization and Command Mode 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 up to and including the admin authorization level.

- 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 Mode Hierarchy" section on page 2-3.)

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 hostname.

Note   Throughout this document, SCE is used as the sample host name.

CLI Authorization Levels

The Cisco SCE platform has four authorization levels, which represent the user access permissions. When you initially connect to the Cisco SCE 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 Cisco SCE 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 2-1.

Table 2-1   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 2-1   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 Cisco SCE 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	#>

CLI Command Mode 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 Cisco SCE platform, file system operations, and other operations that cannot alter the configuration of the Cisco SCE platform.

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 Cisco SCE platform 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 Cisco SCE platform restores the saved configuration.

Table 2-2 shows the available CLI modes.

Table 2-2   CLI Modes

Mode	Description	Level	Prompt Indication
User EXEC	Initial mode. Also allows monitoring of the system (**show** commands).	User/Viewer	SCE>
Privileged EXEC	General administration; file system manipulations and control of basic parameters that do not change the configuration of the Cisco SCE platform.	• Admin • Root	• SCE# • SCE#>
Global Configuration	Configuration of general system parameters, such as DNS, host name, and time zone.	• Admin • Root	• SCE(config)# • SCE(config)#>
Management Interface Configuration	Configuration of management interface parameters, such as the Ethernet interface properties and selection of the active port.	• Admin • Root	• SCE(config if)# • SCE(config if)#>
Interface Configuration	Configuration of specific system interface parameters, for the following interface modes: • Linecard interface • Specific traffic interface	• Admin • Root	• SCE(config if)# • SCE(config if)#>
Interface Range Configuration	Configuration of a range of traffic interfaces.	• Admin • Root	• SCE(config if range)# • SCE(config if range)#>
Line Configuration	Configuration of Telnet lines, such as an access list.	• Admin • Root	• SCE(config-line)# • SCE(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 command specific to that mode.

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

Figure 2-1 illustrates the hierarchical structure of the CLI modes, and the CLI commands used to enter and exit a mode.

Figure 2-1   CLI Command Modes
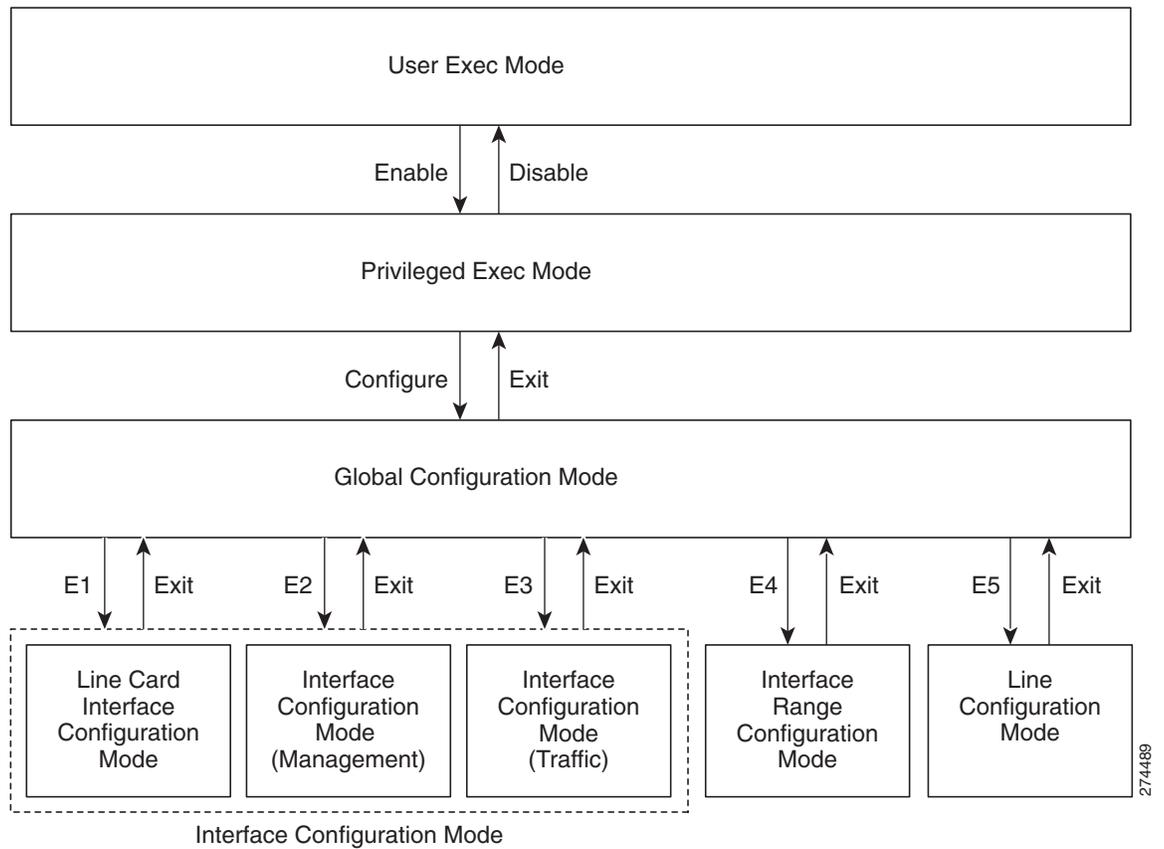
The following commands are used to enter the various specific configuration modes from the global configuration mode:

- E1—**interface Linecard 0**
- E2 (management ports)—**interface Mng** *0/1, 0/2* **OR interface GigabitEthernet** *1/1, 1/2*
- E3 (traffic ports)—**interface GigabitEthernet** *3/0/0-3/0/7*, *3/1/0-3/1/7*
- E4—**interface range GigabitEthernet** *3/<bay-range (0 | 1 | 0-1)>/<port-range (any range between 0 and 7)>*
- E5—**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**) will act as a **0** and configure 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 Figure 2-1).

Example:

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

1. Enter the global configuration mode.
2. Configure the Cisco SCE platform time zone.
3. Enter the MNG (management) interface configuration mode.
4. Configure the speed of the management interface.
5. Exit the MNG interface configuration mode to the global configuration mode.
6. Enter the linecard interface configuration.
7. Define the link mode.
8. Exit linecard lnterface configuration mode to user EXEC mode.

```
SCE#configure
SCE(config)#clock timezone PST -10
SCE(config)#interface mng 0/1
SCE(config if)#speed 100
SCE(config if)#exit
SCE(config)#interface Linecard 0
SCE(config if)#link mode forwarding
SCE(config if)#end
sce>
```

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 shown in Table 2-3.

Table 2-3   Prompt Indications: Authorization Levels

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

Command hierarchy levels are indicated as shown in Table 2-4.

Table 2-4   Prompt Indications: Command Hierarchy Levels

This command hierarchy...	Is indicated as...
User Exec	SCE>
Privileged Exec	sce#
Global Configuration	SCE (config)#
Interface Configuration	SCE (config if)#
Interface Range Configuration	SCE (config if range)#
Line Configuration	SCE (config-line)#

Example:

The prompt SCE1(config if)# indicates:

- The name of the Cisco SCE platform is SCE1
- The current CLI mode is Interface configuration mode
- The user has Admin authorization level

Navigating Between Authorization Levels and Command Modes

The authorization levels and command modes function together under one hierarchy. The User and Viewer authorization levels have only a single command mode. When you enter either the Admin authorization level or Root authorization level (these levels function in parallel), you enter the Privileged EXEC command mode. From this command mode you can access the following command modes:

- User EXEC authorization level
- Viewer authorization level
- Privileged EXEC command mode (in either the Admin authorization level or the Root authorization level)

- Global Configuration command mode

  From this command mode, the following Interface Command Modes can be accessed:

  - MNG Interface Configuration (management interface)
  - Linecard Interface Configuration
  - GigabitEthernet Interface Configuration (GBE traffic interfaces)
  - Interface Range Configuration (range of traffic interfaces)
  - Line Configuration

Table 2-5 summarizes how to navigate the CLI command hierarchy.

Table 2-5   CLI Command Hierarchy

Authorization Level or Command Mode	Use this Command to Access	Use this Command to Exit
User EXEC	Not applicable	**logout** or **exit** (exits the current CLI session)
Viewer	**enable 5**	**disable**
Privileged EXEC	**enable 10** or **enable 15** (accesses root level)	**disable**
Global Configuration	**configure**	**exit** (exits to Privileged EXEC) **end** (exits to User EXEC)
MNG Interface Configuration (management)	**interface mng (0/1 | 0/2)** OR **interface gigabitethernet (1/1 | 1/2)**	**exit** (exits to Global Configuration) **end** (exits to User EXEC)
Linecard Interface Configuration	**interface linecard 0**	**exit** (exits to Global Configuration) **end** (exits to User EXEC)
GigabitEthernet Interface Configuration (GBE traffic)	**interface gigabitethernet** *3/<bay-number (0|1)>/<port-number (0-7)>* OR **interface range gigabitethernet** *3/<bay-range (0 | 1 | 0-1)>/<port-range (any range between 0 and 7)>*	**exit** (exits to Global Configuration) **end** (exits to User EXEC)
Line Configuration	**line vty 0**	**exit** (exits to Global Configuration) **end** (exits to User EXEC)

The do Command: Executing Commands Without Exiting

When you are in either the global configuration mode or any of the interface 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.

How to execute an EXEC mode command from a configuration command mode

Step 1   At the SCE(config)# (or SCE(config if)# or SCE(config-line)#) prompt, type **do** <*command*> and press **Enter**.

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.

```
SCE(config if#) do show running-config
```

CLI Help Features

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

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.

```
SCE(config)#snmp-server c?
Communitycontact
SCE(config)#snmp-server c
```

Argument Help

To obtain a list of keywords or parameters associated with a command, 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**.

```
SCE(config)#snmp-server?
community Define community string
contact Set system contact
enable Enable the SNMP agent
host Set traps destination
interface Set interface parameters
SCE(config)# snmp-server
```

When asking for help on 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**.

```
SCE#copy?
running-config Copy running configuration file
startup-config Backup the startup-config to a specified destination
STRING Source file
SCE#copy
```

Table 2-6 summarizes the CLI help features.

Table 2-6   Getting Help

Command	Purpose
?	List all commands available for a particular command mode

*<abbreviated-command-entry>***?**
 	
Example:
`c?`
`calendar  cd  clear  clock  configure`
`copy  copy-passive`
	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>**
 	
Example:
`en <Tab>`
`enable`
	Complete a partial command name.

*<command>***?**	List the keywords associated with the specified command.

<command keyword> **?**
 	
Example:
`show ?`
`access-lists      Show all access-lists`
	List the arguments associated with the specified keyword.
	
	Leave a space between the keyword and question mark

Navigational and Shortcut Features

This section contains the following information:

- Command History, page 2-11
- Keyboard Shortcuts, page 2-11
- Auto Completion, page 2-12
- FTP User Name and Password, page 2-13

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 2-7.

Table 2-7   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 Cisco SCE platform has several keyboard shortcuts that make it easier to navigate and use the system. Table 2-8 shows the keyboard shortcuts available.

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

Table 2-8   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	

Table 2-8   Keyboard Shortcuts (continued)

Description	Shortcut key
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
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

Auto Completion

The CLI interface features tab completion. When you type in the first letters of a command and press **<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**.

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

If you press **<Enter>** instead of **<Tab>**, and there is no ambiguity, the system actually carries out the command that is the result of the auto-completion.

Example: 1

The following example displays how the system completes a partial (unique) command for the **enable** command. The system carries out the command using the default authorization level (10) when you press **<Enter>**.

```
SCE>en <Enter>
Password:
sce#
```

Example: 2

The following example illustrates how to use the completion feature with a non-default value for the argument. In this example, the **enable** command is completed using the specified value (15) for the authorization level.

```
SCE>en 15 <Enter>
Password:
sce#
```

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.

```
sce#ip FTP password pw123
sce#ip FTP username user1
sce#copy ftp://@10.10.10.10/h:/config.tmp myconf.txt connecting 10.10.10.10 (user name
user1 password pw123) to retrieve config.tmp
sce#
```

Managing Command Output

This section describes the following topics:

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** command to disable this feature so that **show** commands display the complete output all at one time.

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.

```
sce# show version | begin revision
```

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** *filename*

- *command* | **append** *filename*

This example illustrates how to do the following:

- Filter the **more** command to display only the gold package subscribers from a csv subscriber file.

- Redirect that output to a file named *current_gold_subscribers*. The output should not overwrite existing entries in the file, but should be appended to the end of the file.

```
sce# more subscribers_10.10.2008 include gold | append current_gold_subscribers
```

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 Cisco SCE platforms 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 Cisco SCE platforms. The available script commands are:

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

Step 1   At the sce# prompt, type **script capture** *filename.scr* where *filename.scr* is the name of the script, with a scr file extension.

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 upgrading software.

```
sce#script capture upgrade.scr
sce#configure
SCE(config)#boot system new.pkg Verifying package file...
Package file verified OK.
SCE(config)#exit
sce#copy running-config startup-config
Writing general configuration file to temporary location...
Extracting files from '//apps/data/scos/images/new.pkg'...
Verifying package file...
Package file verified OK.
Device '//apps/data/scos/' has 81154048 bytes free, 21447973 bytes are needed for
extraction, all is well.
Extracting files to temp locations...
Renaming temp files...
Extracted OK.
Backing-up general configuration file...
Copy temporary file to final location...
sce#script stop
sce#
```