



# Command-Line Interface

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This chapter describes the command-line interface (CLI) available on the Catalyst 4000 family, Catalyst 2948G, and Catalyst 2980G switches and contains the following sections:

- [Switch CLI](#), page 1-1
- [ROM Monitor CLI](#), page 1-9

[Appendix A](#) contains a list of acronyms used in this publication. For complete definitions of terms listed in this publication, refer to the *Internetworking Terms and Acronyms* publication.

## Switch CLI

The Catalyst 4000 family, Catalyst 2948G, and Catalyst 2980G switches are multimodule systems. Commands you enter from the CLI can apply to the entire system or to a specific module, port, or VLAN.

You can configure and maintain the Catalyst 4000 family, Catalyst 2948G, and Catalyst 2980G switch's Ethernet, Fast Ethernet, Gigabit Ethernet, CDDI, and FDDI modules by entering commands from the switch CLI. The CLI is a basic command-line interpreter similar to the UNIX C shell. Using the CLI **session** command, you can access the router configuration software and perform tasks such as history substitution and alias creation.

## Accessing the Switch CLI

You can access the switch CLI from a console terminal connected to an EIA/TIA-232 port or through a Telnet session. The CLI allows fixed baud rates. Telnet sessions disconnect automatically after remaining idle for a user-defined time period.



Note

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EIA/TIA-232 was known as RS-232 before its acceptance as a standard by the Electronic Industries Alliance and Telecommunications Industry Association.

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## Accessing the Switch CLI through the Console (EIA/TIA-232) Port

To access the switch through the console (EIA/TIA-232) port, perform these steps:

	Task	Command
Step 1	From the Cisco Systems Console prompt, press <b>Return</b> .	
Step 2	At the prompt, enter the system password. The <code>Console&gt;</code> prompt indicates that you have accessed the CLI in normal mode.	<code>&lt;password&gt;</code>
Step 3	Enter the necessary commands to complete your tasks.	Appropriate commands
Step 4	When finished, exit the session.	<b>quit</b>

After connecting through the console port, you see this display:

```
Cisco Systems Console
Enter password:
Console>
Console>
```

## Accessing the Switch CLI through Telnet

You can open multiple sessions to the switch through Telnet. To access the switch through a Telnet session, you must first set the IP address for the switch. To set the IP address, use the **set interface** command.

To access the switch from a remote host with Telnet, perform these steps:

	Task	Command
Step 1	From the remote host, enter the <b>telnet</b> command and the name or IP address of the switch you want to access.	<code>telnet hostname   ip_addr</code>
Step 2	At the prompt, enter the password for the CLI. If no password has been configured, press <b>Return</b> .	<code>&lt;password&gt;</code>
Step 3	Enter the necessary commands to complete your tasks.	Appropriate commands
Step 4	When finished, exit the Telnet session.	<b>quit</b>

After connecting through a Telnet session, you will see this display:

```
host% telnet cat5000-1.cisco.com
Trying 172.16.44.30 ...
Connected to cat4000-1.
```

## Operating the Switch CLI

This section describes command modes and functions that allow you to operate the switch CLI.

### Accessing the Command Modes

The CLI has two modes of operation: normal (login) and privileged (enable). Both are password-protected. Use normal-mode commands for everyday system monitoring. Use privileged commands for system configuration and basic troubleshooting.

After you log in, the system enters normal mode, which gives you access to normal-mode commands only. You can enter privileged mode by entering the **enable** command followed by the enable password. Privileged mode is indicated by the word “enable” in the system prompt. To return to normal mode, enter the **disable** command at the prompt.

The following example shows how to enter privileged mode:

```
Console> enable
Enter password: <password>
Console> (enable)
```

### Command-Line Editing

Switch commands are not case sensitive. You can abbreviate commands and parameters as long as they contain enough letters to be different from any other commands or parameters available in the same operating mode. You can scroll through the last 20 commands stored in the history buffer, and enter or edit the command at the prompt. [Table 1-1](#) describes the keys used for editing.

**Table 1-1** Command-Line Editing Keystrokes

Keystroke	Function
Ctrl-A	Jumps to the first character of the command line
Ctrl-B or the left arrow key <sup>1</sup>	Moves the cursor back one character
Ctrl-C	Escapes and terminates prompts and tasks
Ctrl-D	Deletes the character at the cursor
Ctrl-E	Jumps to the end of the current command line
Ctrl-F or the right arrow key <sup>1</sup>	Moves the cursor forward one character
Ctrl-K	Deletes everything from the cursor position to the end of the command line
Ctrl-L; Ctrl-R	Repeats the current command line on a new line
Ctrl-N or the down arrow key <sup>1</sup>	Displays the next command line in the history buffer
Ctrl-P or the up arrow key <sup>1</sup>	Displays the previous command line in the history buffer
Ctrl-U; Ctrl-X	Deletes everything from the cursor position to the beginning of the command line
Ctrl-W	Deletes the last word typed
Esc B	Moves the cursor back one word
Esc D	Deletes everything from the cursor position to the end of the word

**Table 1-1** Command-Line Editing Keystrokes (continued)

Keystroke	Function
Esc F	Moves the cursor forward one word
Delete key or Backspace key	Erases a mistake made when entering a command; reenter the command after using this key

1. The arrow keys function only on ANSI-compatible terminals such as VT100s.

## Using History Substitution

Commands that you enter during each terminal session are stored in a history buffer, which stores the last 20 commands you entered. History substitution allows you to access these commands without retyping them by using special abbreviated commands. [Table 1-2](#) describes the history substitution commands.

**Table 1-2** History Substitution Commands

Command	Function
<b>To repeat recent commands:</b>	
!!	Repeats the most recent command
!-nn	Repeats the <i>nn</i> th most recent command
!n	Repeats command <i>n</i>
!aaa	Repeats the command beginning with string <i>aaa</i>
!?aaa	Repeats the command containing the string <i>aaa</i>
<b>To modify and repeat the most recent command:</b>	
^aaa^bbb	Replaces the string <i>aaa</i> with the string <i>bbb</i> in the most recent command
<b>To add a string to the end of a previous command and repeat it:</b>	
!!aaa	Adds string <i>aaa</i> to the end of the most recent command.
!n aaa	Adds string <i>aaa</i> to the end of command <i>n</i>
!aaa bbb	Adds string <i>bbb</i> to the end of the command beginning with string <i>aaa</i>
!?aaa bbb	Adds string <i>bbb</i> to the end of the command containing the string <i>aaa</i>

## Abbreviating a Command

You can abbreviate commands and keywords to the number of characters that allow a unique abbreviation.

You can abbreviate the **show** command to **sh**. After entering the command at the system prompt, press **Return** to run the command.

## Completing a Partial Command

The **Tab** key allows you to use the command-completion feature. When you enter a unique partial character string and press the **Tab** key, the system automatically completes the command or keyword on the command line.

For example, if you enter **co** and press the **Tab** key, the system completes the command as **configure** because it is the only command that matches the criteria.

## Scrolling Down a Line or a Screen

When the output of a command fills more than one terminal screen, a ---More--- prompt is displayed at the bottom of the screen. To view the next line or screen, perform these tasks:

Task	Keystrokes
Scroll down one line	Press the <b>Return</b> key
Scroll down one screen	Press the <b>Spacebar</b>



Note

The ---More--- prompt is used for any output that has more lines than can be displayed on the terminal screen, including **show** command output.

## Using Command Aliases

Like regular commands, aliases are not case sensitive. However, unlike regular commands, some aliases cannot be abbreviated. See [Table 1-3](#) for a list of switch CLI aliases that cannot be abbreviated.

*Table 1-3 Switch CLI Command Aliases*

Alias	Command
<b>?</b>	<b>help</b>
<b>batch</b>	<b>configure</b>
<b>di</b>	<b>show</b>
<b>exit</b>	<b>quit</b>
<b>logout</b>	<b>quit</b>

## Specifying Modules, Ports, and VLANs

Modules, ports, and VLANs are numbered sequentially, beginning with 1. The supervisor engine module is module 1, residing in slot 1.

To designate a specific module, use the module number. In most systems, the module number and the slot number are the same. However, in some cases the slot number and the module number are different. For example, the Route Switch Feature Card (RSFC) on the supervisor engine is physically in slot 1 or slot 2 but is logically identified as module 15 or module 16.

On the fixed-configuration switches, there are two logical modules. However, on the Catalyst 4912G switch, there are two modules but only one slot. When you enter configuration commands on these switches, you must refer to the module number, not the slot number. For example, all of the user-configurable ports on these switches are logically on module 2.

On modules that have user-configurable ports, the left-most port is always port 1. To designate a specific port on a specific module, the command syntax is *mod\_num/port\_num*. For example, *3/1* specifies module 3, port 1. On the Catalyst 4912G switch, the left-most switch port is numbered *2/1* rather than *1/1* because the ports are logically located on module 2.

With many commands you can enter lists of ports. To specify a range of ports, use a comma-separated list (do not insert spaces) to specify individual ports or a hyphen (-) between the port numbers to specify a range of ports. Hyphens take precedence over commas.

Table 1-4 shows examples of how to designate ports and port ranges.

**Table 1-4 Designating Ports and Port Ranges**

Example	Function
2/1	Specifies port 1 on module 2
3/4-8	Specifies ports 4, 5, 6, 7, and 8 on module 3
5/2,5/4,6/10	Specifies ports 2 and 4 on module 5 and port 10 on module 6
3/1-2,4/8	Specifies ports 1 and 2 on module 3 and port 8 on module 4

VLANs are identified using the VLAN ID, a single number associated with the VLAN. To specify a list of VLANs, use a comma-separated list (do not insert spaces) to specify individual VLANs or use a hyphen (-) between the VLAN numbers to specify a range of VLANs.

Table 1-5 shows examples of how to designate VLANs and VLAN ranges.

**Table 1-5 Designating VLANs and VLAN Ranges**

Example	Function
10	Specifies VLAN 10
5,10,15	Specifies VLANs 5, 10, and 15
10-50,500	Specifies VLANs 10 through 50, inclusive, and VLAN 500

## Specifying MAC Addresses

Some commands require you to specify a Media Access Control (MAC) address, which must be designated in a standard format. The MAC address format must be six hexadecimal numbers separated by hyphens, as shown in the following example:

```
00-00-0c-24-d2-fe
```

## Specifying IP Addresses, Hostnames, and IP Aliases

Some commands require an IP address, IP hostname, or IP alias. The IP address format is 32 bits, written in dotted decimal format, as shown in the following example:

```
172.16.10.1
```

If DNS is configured properly on the switch, you can use IP hostnames instead of IP addresses. For information on configuring DNS, see the *Software Configuration Guide—Catalyst 4000 Family, Catalyst 2948G, and Catalyst 2980G Switches*.

You also can configure IP aliases on the switch, which you can use in place of IP addresses. IP aliases can be used for most commands that use an IP address, except for commands that define the IP address or IP alias. For information on using IP aliases, see the *Software Configuration Guide—Catalyst 4000 Family, Catalyst 2948G, and Catalyst 2980G Switches*.

## Accessing Command Help

To display a list of top-level commands and command categories, enter **help** or **?** in normal or privileged mode. Context-sensitive help (usage and syntax information) for individual commands can be seen by appending **help** or **?** to any specific command. If you enter a command using the wrong number of arguments or inappropriate arguments, usage and syntax information for that command is displayed. Additionally, appending **help** or **?** to a command category displays a list of commands in that category.

### Displaying Top-Level Commands and Command Categories

In normal mode, enter **help** or **?** to display top-level commands and command categories, as follows:

```
Console> help
Commands:
-----
cd                Set default flash device
dir              Show list of files on flash device
enable          Enable privileged mode
help            Show this message
history         Show contents of history substitution buffer
ping           Send echo packets to hosts
pwd            Show default flash device
quit          Exit from the Admin session
session       Tunnel to ATM or Router module
set           Set, use 'set help' for more info
show         Show, use 'show help' for more info
traceroute   Trace the route to a host
verify       Verify checksum of file on flash device
wait         Wait for x seconds
whichboot    Which file booted
Console>
```

In privileged mode, enter **help** or **?** to display top-level commands and command categories, as follows:

```
Console> (enable) help
Commands:
-----
cd                Set default flash device
clear            Clear, use 'clear help' for more info
configure        Configure system from network
copy             Copy files between TFTP/module/flash devices
delete          Delete a file on flash device
dir             Show list of files on flash device
disable         Disable privileged mode
disconnect       Disconnect user session
download        Download code to a processor
enable          Enable privileged mode
format          Format a flash device
help           Show this message
history         Show contents of history substitution buffer
ping           Send echo packets to hosts
pwd            Show default flash device
```

```

quit                Exit from the Admin session
reconfirm           Reconfirm VMPS
reload              Force software reload to linecard
reset               Reset system or module
session             Tunnel to ATM or Router module
set                 Set, use 'set help' for more info
show                Show, use 'show help' for more info
slip                Attach/detach Serial Line IP interface
squeeze            Reclaim space used by deleted files
switch              Switch to standby <clock|supervisor>
telnet              Telnet to a remote host
test                Test, use 'test help' for more info
traceroute          Trace the route to a host
undelete            Undelete a file on flash device
upload              Upload code from a processor
verify              Verify checksum of file on flash device
wait                Wait for x seconds
whichboot           Which file booted
write                Write system configuration to terminal/network
Console> (enable)

```

## Displaying Command Categories

When you enter **help** or **?** after some commands (such as **clear**, **set**, and **show**), a list of commands in that category is displayed. For example, the following display shows a partial list of commands for the **clear** category:

```
Console> (enable) clear help
```

```
Clear commands:
```

```

-----
clear alias          Clear aliases of commands
clear arp            Clear ARP table entries
clear banner         Clear Message Of The Day banner
clear boot           Clear booting environment variable
clear cam            Clear CAM table entries
...

```

## Using Context-Sensitive Help

Usage and syntax information for individual commands are displayed by appending **help** or **?** to any specific command. For example, the following display shows usage and syntax information for the **set length** command:

```

Console> set length help
Usage: set length <screenlength>
      (screenlength = 5..512, 0 to disable 'more' feature)
Console>

```

## Performing Keyword Lookups

You can use the self-repeat feature and the keyword-lookup or partial-keyword-lookup functions by entering **?**.

To use the keyword-lookup function, enter **?** to display a list of valid keywords and arguments for a command. Insert a space between the last parameter and the question mark (**?**). For example, eight parameters are used by the **set mls** command. To see these parameters, enter **set mls ?** at the privileged prompt.

The system displays all valid keywords and arguments as follows:

```
Console> (enable) set mls ?
agingtime          Set agingtime for MLS cache entry
disable            Disable MLS in the switch
enable            Enable MLS in the switch
nde                Configure Netflow Data Export
flow              Set minimum flow mask
include           Include MLS-RP
multicast         Set MLS feature for multicast
statistics        Add protocols to protocol statistics list
Console> (enable) set mls
```

Note that the system repeats the command you entered without the ?.

To use the partial-keyword-lookup function, enter ? to display a list of commands that begin with a specific set of characters. Do not insert a space between the last letter of the variable and the question mark (?). For example, enter **co?** at the privileged prompt to display a list of commands that start with **co**. The system displays all commands that begin with **co** as follows:

```
Console> (enable) co?
configureConfigure system from network
copy Copy files between TFTP/RCP/module/flash devices
Console> (enable) co
```

Note that the system repeats the command you entered without the ?.

## ROM Monitor CLI

The ROM monitor is a ROM-based program that runs at power-up or reset, or when a fatal exception occurs.

### Accessing the ROM Monitor CLI

The system enters ROM monitor mode if the switch does not find a valid system image, if the nonvolatile RAM (NVRAM) configuration is corrupted, or if the configuration register is set to enter ROM monitor mode. You can manually load an image from any Flash device.

You can also enter ROM monitor mode by restarting the switch and pressing the Break key during the first 60 seconds of startup.



#### Note

The Break key is always enabled for 60 seconds after rebooting the system, regardless of whether the Break key is configured to be off by configuration register settings.

To access the ROM monitor through a terminal server, you can escape to the Telnet prompt and enter the **send break** command for your terminal emulation program to break into ROM monitor mode.

Once you are in ROM monitor mode, the prompt changes to **rommon>**. Use the ? command to see the available ROM monitor commands.

## Operating the ROM Monitor CLI

ROM monitor commands are used to load and copy system images, microcode images, and configuration files. System images contain the system software. Microcode images contain microcode to be downloaded to various hardware devices. Configuration files contain commands entered to customize the function of Cisco IOS software.

The manual boot command has the following syntax:

**boot** [-xv] [*device*][*imagename*]

If you do not specify an image name, the system defaults to the first valid file in the device. The image name is case sensitive.



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**Note**

The Catalyst enterprise LAN switches do not support netboot.

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When you enter the ROM monitor mode, the prompt changes to rommon #>.