CHAPTER 1

Command-Line Interface

This chapter provides information for understanding and using the Cisco IOS command-line interface (CLI) on the Catalyst 4500 series switch. This chapter includes the following sections:

For an overview of the Catalyst 4500 series switch Cisco IOS configuration, refer to the *Catalyst 4500 Series Switch Cisco IOS Software Configuration Guide*

Getting Help

To display a list of commands that you can use within a command mode, enter a question mark (**?** system prompt. You also can display keywords and arguments for each command with this context-sensitive help feature.

Table 1-1 lists commands you can enter to get help that is specific to a command mode, a command, a keyword, or an argument.

Table 1-1 Getting Help

Command	Purpose
abbreviated-command-entry	
abbreviated-command-entry<**Tab**>	Completes a partial command name.
?	Lists all commands for the command mode.
?	Lists all keywords for the command. Leave a space between the command and the question mark.
keyword	

How to Find Command Options

arap

arap ?

?

interface gigabitethernet 1/1

channel-group 1 mode auto

Table 1-2 How to Find Command Options

`Switch> enable`
`Password: <password>`
`Switch#`
	Enter the command and password to access privileged EXEC commands.
	You are in privileged EXEC mode when the prompt changes to .

`configure terminal`
`Enter configuration commands, one per line. End with CNTL/Z.`
`Switch(config)#`
	`Switch(config)#.`

`Switch(config)# interface gigabitethernet ?`
`<1-9> GigabitEthernet interface number`
`Switch(config)# interface gigabitethernet 1/1`
	interface number from 1 to 9 in the format */port-number.*
	You are in interface configuration mode when the prompt changes to

```
Interface configuration commands:
  access-expression  Build a bridge boolean access expression
  apollo             Apollo interface subcommands
  appletalk          Appletalk interface subcommands
  arp                Set arp type (arpa, probe, snap) or timeout
  backup             Modify backup parameters
  bandwidth          Set bandwidth informational parameter
  bgp-policy         Apply policy propogated by bgp community string
  bridge-group       Transparent bridging interface parameters
  carrier-delay      Specify delay for interface transitions
  cdp                CDP interface subcommands
  channel-group      Etherchannel/port bundling configuration
  clns               CLNS interface subcommands
  cmns               OSI CMNS
  custom-queue-list  Assign a custom queue list to an interface
  decnet             Interface DECnet config commands
  default            Set a command to its defaults
  delay              Specify interface throughput delay
  description        Interface specific description
  dlsw               DLSw interface subcommands
  dspu               Down Stream PU
  exit               Exit from interface configuration mode
  fair-queue         Enable Fair Queuing on an Interface
  flowcontrol        Configure flow operation.
  fras               DLC Switch Interface Command
  help               Description of the interactive help system
  hold-queue         Set hold queue depth
  ip                 Interface Internet Protocol config commands
  ipx                Novell/IPX interface subcommands
  isis               IS-IS commands
  iso-igrp           ISO-IGRP interface subcommands

.
.
.

Switch(config-if)#
```

```
Switch(config-if)# channel-group ?
```

Because a is not displayed, it indicates that you must enter more information to complete the command.

<1-256> Channel group number Switch(config-if)#channel-group	After you enter the keyword, enter a to display what you must enter next on the command line. In this example, you must enter a channel group number from 1 to 256. Because a <cr> is not displayed, it indicates that you must enter more information to complete the command.
Switch(config-if)# mode Etherchannel Mode of the interface Switch(config-if)#	After you enter the channel group number, enter a to display what you must enter next on the command line. In this example, you must enter the keyword. Because a <cr> is not displayed, it indicates that you must enter more information to complete the command.
Switch(config-if)# **channel-group 1 mode ?**	**desirable on**
	auto **auto** **?** indicates that you can press Return to complete the command. If additional keywords are listed, you can enter more keywords or press Return to complete the command.
	In this example, press Return to complete the command.

Understanding Command Modes

When you start a session on the Catalyst 4500 series switch, you begin in user mode, often called EXEC mode. Only a limited subset of the commands are available in EXEC mode. In order to have access to all commands, you must enter privileged EXEC mode. Normally, you must enter a password to enter privileged EXEC mode. From privileged EXEC mode, you can enter any EXEC command or enter global configuration mode. Most EXEC commands are one-time commands, such as **show**
clear

Table 1-3 provides a summary of the main command modes.

Table 1-3 Summary of Main Command Modes

Command Mode	Access Method	Prompt	Exit Method
Privileged EXEC	From user EXEC mode, enter the EXEC command.		To exit to user EXEC mode, enter the command. To enter global configuration mode, enter the privileged EXEC command.
Global configuration	From privileged EXEC mode, enter the privileged EXEC command.		To exit to privileged EXEC mode, enter the **exit** **end** **Ctrl-Z** **interface**
	interface		**exit** **exit** **Ctrl-Z** **interface**

Subinterface configuration	From interface configuration mode, specify a subinterface with an command.		To exit to global configuration mode, enter the command. To enter privileged EXEC mode, enter the command or press .
ROM monitor	From privileged EXEC mode, enter the EXEC command. Press the Break key during the first 60 seconds while the system is booting.		To exit ROM-monitor mode, you must reload the image by entering the command. If you use the command without specifying a file or any other boot instructions, the system boots from the default Flash image (the first image in onboard Flash memory). Otherwise, you can instruct the system to boot from a specific Flash image (using the **boot system flash** command).

For more information on command modes, refer to the "Using the Command Line Interface" chapter of the *Configuration Fundamentals Configuration Guide*

Using the No and Default Forms of Commands

Using the CLI String Search

matching requirements. Examples of simple regular expressions are Serial, misses, and 138. Examples of complex regular expressions are 00210..., (is), and [Oo]utput.

-
-
-

Note The CLI string search function does not allow you to search or filter backward through previous output; filtering cannot be specified using HTTP access to the CLI.

Regular Expressions

Single-Character Patterns

command output. You can use any letter (A-Z, a-z) or digit (0-9) as a single-character pattern. You can also use other keyboard characters (such as ! or ~) as single-character patterns, but certain keyboard characters have special meaning when used in regular expressions. Table 1-4 lists the keyboard characters that have special meaning.

Table 1-4 Characters with Special Meaning

	Special Meaning
*	Matches 0 or more sequences of the pattern.
+	Matches 1 or more sequences of the pattern.
?	Matches 0 or 1 occurrences of the pattern.
^	Matches the beginning of the string.
$	Matches the end of the string.
_ (underscore)	Matches a comma (,), left brace ({), right brace (}), left parenthesis (( ), right parenthesis ( )), the beginning of the string, the end of the string, or a space.

To enter these special characters as single-character patterns, remove the special meaning by preceding each character with a backslash (\). These examples are single-character patterns matching a dollar sign, an underscore, and a plus sign, respectively.

\$ _ \+

You can specify a range of single-character patterns to match against command output. For example, you can create a regular expression that matches a string containing one of the following letters: a, e, i, o, or u. One and only one of these characters must exist in the string for pattern matching to succeed. To specify a range of single-character patterns, enclose the single-character patterns in square brackets ([ ]). For example,

[aeiou]

[abcdABCD]

[a-dA-D]

[a-dA-D\-]

[a-dA-D\-\]]

[^a-dqsv]

[^\]d]

Multiple-Character Patterns

create multiple-character regular expressions by joining letters, digits, or keyboard characters that do not have special meaning. For example, a4% is a multiple-character regular expression. Put a backslash in front of the keyboard characters that have special meaning when you want to remove their special meaning.

With multiple-character patterns, order is important. The regular expression a4% matches the character a followed by a 4 followed by a % sign. If the string does not have a4%, in that order, pattern matching fails. This multiple-character regular expression:

a.

a\.

telebit 3107 v32bis

Table 1-5 Special Characters Used as Multipliers

	Description

a*

a+

ba?b

******

(ab)*

([A-Za-z][0-9])+

Alternation

alternative patterns with a vertical bar (|). Exactly one of the alternatives can match the string. For example, the regular expression

|

matches the string codex or the string telebit, but not both codex and telebit.

Anchoring

Table 1-6 Special Characters Used for Anchoring

matches any string that has 1300 somewhere in the string. The string's 1300 can be preceded by or end with a space, brace, comma, or underscore. For example:

{1300_

^1300$ ^1300(space) (space)1300 {1300, ,1300, {1300} ,1300, (1300

_1300_

Parentheses for Recall

Saving Configuration Changes

```
copy system:running-config nvram:startup-config
```

```
[OK]
Switch#
```

On most platforms, this step saves the configuration to NVRAM. On the Class A Flash file system platforms, this step saves the configuration to the location specified by the CONFIG_FILE environment variable. The CONFIG_FILE environment variable defaults to NVRAM.

You should use these commands only when you are working directly with your technical support representative, while troubleshooting a problem. Do not use these commands unless your technical support representative asks you to do so.

The commands are not described in this document.