

Using the Command Line Interface (CLI)

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Overview

The CLI is a text-based command interface for configuring and monitoring the switch. The CLI gives you access to the switch's full set of commands while providing the same password protection that is used in the web browser interface and the menu interface.

Accessing the CLI

Like the menu interface, the CLI is accessed through the switch console, and in the switch's factory default state, is the default interface when you start a console session. You can access the console out-of-band by directly connecting a terminal device to the switch, or in-band by using Telnet either from a terminal device or through the web browser interface.

Also, if you are using the menu interface, you can access the CLI by selecting the **Command Line (CLI)** option in the Main Menu.

Using the CLI

The CLI offers these privilege levels to help protect the switch from unauthorized access:

1. Operator
2. Manager
3. Global Configuration
4. Context Configuration

Note

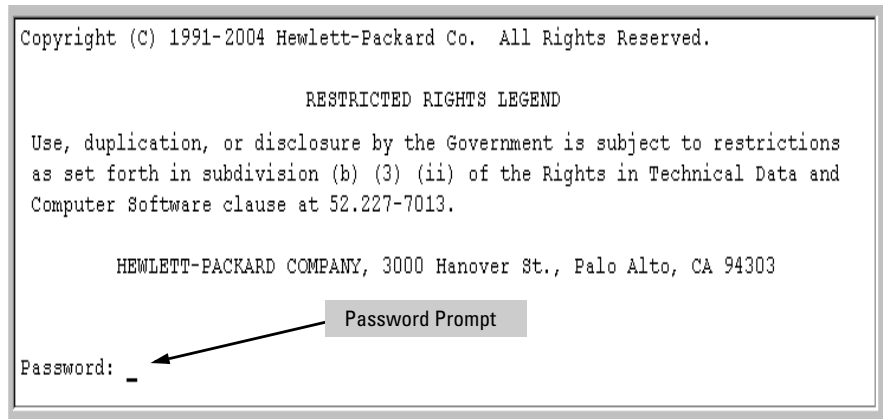
CLI commands are not case-sensitive.

When you use the CLI to make a configuration change, the switch writes the change to the Running-Config file in volatile memory. This allows you to test your configuration changes before making them permanent. To make changes permanent, you must use the **write memory** command to save them to the Startup-Config file in non-volatile memory. If you reboot the switch without first using **write memory**, all changes made since the last reboot or **write memory** (whichever is later) will be lost. For more on switch memory and saving configuration changes, see Chapter 6, “Switch Memory and Configuration”.

Privilege Levels at Logon

Privilege levels control the type of access to the CLI. To implement this control, you must set at least a Manager password. *Without a Manager password configured, anyone having serial port, Telnet, or web browser access to the switch can reach all CLI levels.* (For more on setting passwords, refer to the chapter on usernames and passwords in the *Access Security Guide* for your switch.)

When you use the CLI to log on to the switch, and passwords are set, you will be prompted to enter a password. For example:



```
Copyright (C) 1991-2004 Hewlett-Packard Co. All Rights Reserved.

                          RESTRICTED RIGHTS LEGEND

Use, duplication, or disclosure by the Government is subject to restrictions
as set forth in subdivision (b) (3) (ii) of the Rights in Technical Data and
Computer Software clause at 52.227-7013.

                          HEWLETT-PACKARD COMPANY, 3000 Hanover St., Palo Alto, CA 94303

Password: _
```

The screenshot shows a terminal window with a grey border. At the top, it displays copyright information for Hewlett-Packard Co. from 1991-2004. Below that is a "RESTRICTED RIGHTS LEGEND" section explaining government use restrictions. The company name and address are listed next. At the bottom, there is a "Password:" prompt followed by a single underscore character. A grey callout box labeled "Password Prompt" has an arrow pointing to the underscore.

Figure 4-1. Example of CLI Log-On Screen with Password(s) Set

In the above case, you will enter the CLI at the level corresponding to the password you provide (operator or manager).

If no passwords are set when you log onto the CLI, you will enter at the Manager level. For example:

```
ProCurve# _
```

Caution

ProCurve strongly recommends that you configure a Manager password. If a Manager password is not configured, then the Manager level is not password-protected, and anyone having in-band or out-of-band access to the switch may be able to reach the Manager level and compromise switch and network security. Note that configuring only an Operator password *does not* prevent access to the Manager level by intruders who have the Operator password.

Pressing the Clear button on the front of the switch removes password protection. *For this reason, it is recommended that you protect the switch from physical access by unauthorized persons.* If you are concerned about switch security and operation, you should install the switch in a secure location, such as a locked wiring closet.

Privilege Level Operation

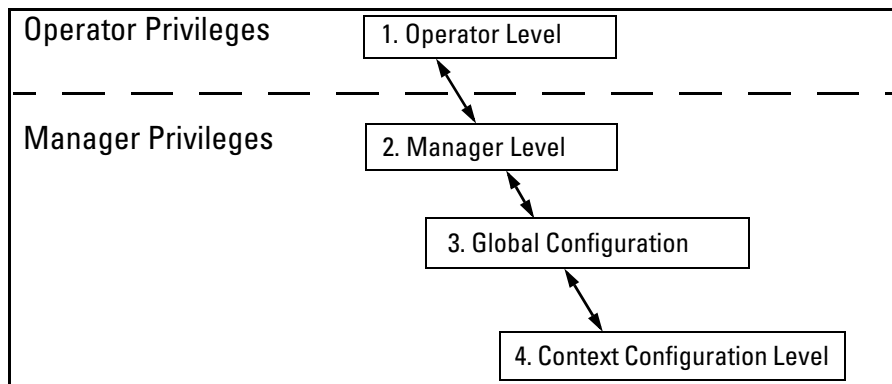


Figure 4-2. Access Sequence for Privilege Levels

Operator Privileges

At the Operator level you can examine the current configuration and move between interfaces without being able to change the configuration. A “>” character delimits the Operator-level prompt. For example:

```
ProCurve> _ (Example of the Operator prompt.)
```

When using **enable** to move to the Manager level, the switch prompts you for the Manager password if one has already been configured.

Manager Privileges

Manager privileges give you three additional levels of access: Manager, Global Configuration, and Context Configuration. A “#” character delimits any Manager prompt. For example:

ProCurve#_ *Example of the Manager prompt.*

- **Manager level:** Provides all Operator level privileges plus the ability to perform system-level actions that do not require saving changes to the system configuration file. The prompt for the Manager level contains only the system name and the “#” delimiter, as shown above. To select this level, enter the **enable** command at the Operator prompt and enter the Manager password, when prompted. For example:

```
ProCurve> enable      Enter enable at the Operator prompt.  
Password:            CLI prompt for the Manager password.  
ProCurve# _         The Manager prompt appears after the  
                     correct Manager password is entered.
```

- **Global Configuration level:** Provides all Operator and Manager level privileges, and enables you to make configuration changes to any of the switch’s software features. The prompt for the Global Configuration level includes the system name and “(config)”. To select this level, enter the **config** command at the Manager prompt. For example:

```
ProCurve# config     Enter config at the Manager prompt.  
ProCurve(config)#_ The Global Config prompt.
```

- **Context Configuration level:** Provides all Operator and Manager privileges, and enables you to make configuration changes in a specific context, such as one or more ports or a VLAN. The prompt for the Context Configuration level includes the system name and the selected context. For example:

```
ProCurve(eth-1)#  
  
ProCurve(vlan-10)#
```

The Context level is useful, for example, for executing several commands directed at the same port or VLAN, or if you want to shorten the command strings for a specific context area. To select this level, enter the specific context at the Global Configuration level prompt. For example, to select the context level for an existing VLAN with the VLAN ID of 10, you would enter the following command and see the indicated result:

```
ProCurve(config)# vlan 10  
  
ProCurve(vlan-10)#
```

Table 4-1. Privilege Level Hierarchy

Privilege Level	Example of Prompt and Permitted Operations		
Operator Privilege			
Operator Level	ProCurve>	show < command > setup	View status and configuration information.
		ping < argument > link-test < argument >	Perform connectivity tests.
		enable	Move from the Operator level to the Manager level.
		menu	Move from the CLI interface to the menu interface.
		logout	Exit from the CLI interface and terminate the console session.
		exit	Terminate the current session (same as logout).
Manager Privilege			
Manager Level	ProCurve#		Perform system-level actions such as system control, monitoring, and diagnostic commands, plus any of the Operator-level commands. For a list of available commands, enter ? at the prompt.
Global Configuration Level	ProCurve(config)#		Execute configuration commands, plus all Operator and Manager commands. For a list of available commands, enter ? at the prompt.
Context Configuration Level	ProCurve(eth-5)# ProCurve(vlan-100)#		Execute context-specific configuration commands, such as a particular VLAN or switch port. This is useful for shortening the command strings you type, and for entering a series of commands for the same context. For a list of available commands, enter ? at the prompt.

How To Move Between Levels

Change in Levels	Example of Prompt, Command, and Result
Operator level <i>to</i> Manager level	ProCurve> enable Password: _ ProCurve# _ After you enter enable , the Password prompt appears. After you enter the Manager password, the system prompt appears with the # symbol:
Manager level <i>to</i> Global configuration level	ProCurve# config ProCurve(config)#
Global configuration level <i>to a</i> Context configuration level	ProCurve(config)# vlan 10 ProCurve(vlan-10)#
Context configuration level <i>to another</i> Context configuration level	ProCurve(vlan-10)# interface e 3 ProCurve(int-3)# The CLI accepts "e" as the abbreviated form of "ethernet".
Move from any level to the preceding level	ProCurve(int-3)# exit ProCurve(config)# exit ProCurve# exit ProCurve>
Move from any level to the Manager level	ProCurve(int-3)# end ProCurve# -or- ProCurve(config)# end ProCurve#

Moving Between the CLI and the Menu Interface. When moving between interfaces, the switch retains the current privilege level (Manager or Operator). That is, if you are at the Operator level in the menu and select the **Command Line Interface (CLI)** option from the Main Menu, the CLI prompt appears at the Operator level.

Changing Parameter Settings. Regardless of which interface is used (CLI, menu interface, or web browser interface), the most recently configured version of a parameter setting overrides any earlier settings for that parameter.

For example, if you use the menu interface to configure an IP address of “X” for VLAN 1 and later use the CLI to configure a different IP address of “Y” for VLAN 1, then “Y” replaces “X” as the IP address for VLAN 1 in the running-config file. If you subsequently execute **write memory** in the CLI, then the switch also stores “Y” as the IP address for VLAN 1 in the startup-config file. (For more on the startup-config and running config files, see Chapter 6, “Switch Memory and Configuration”).

Listing Commands and Command Options

At any privilege level you can:

- List all of the commands available at that level
- List the options for a specific command

Listing Commands Available at Any Privilege Level

At a given privilege level you can list and execute the commands that level offers, plus all of the commands available at preceding levels. For example, at the Operator level, you can list and execute only the Operator level commands. However, at the Manager level, you can list and execute the commands available at both the Operator and Manager levels.

Type “?” To List Available Commands. 1. Typing the ? symbol lists the commands you can execute at the current privilege level. For example, typing ? at the Operator level produces this listing:

```
ProCurve> ?  
  
  enable  
  exit  
  link-test  
  logout  
  menu  
  ping  
  show  
  traceroute  
HPswitch>
```

Figure 4-3. Example of the Operator Level Command Listing

Typing ? at the Manager level produces this listing:

```

ProCurve# ?
boot                Reboot the device.
clear               Clear table/statistics or authorized client public
                   keys.
configure           Enter the Configuration context.
copy               Copy datafiles to/from the switch.
debug              Enable/disable debug logging.
display            Display the running/saved configuration.
end                Return to the Manager Exec context.
erase              Erase the configuration file stored in flash or.
getMIB             Retrieve and display the value of the MIB objects
                   specified.
kill               Kill other active console, telnet, or ssh sessions.
log                Display log events.
page               Toggle paging mode.
print              Execute a command and redirect its output to the device
                   channel for current session.
redo               Re-execute a command from history.
reload             Warm reboot of the switch.
repeat             Repeat execution of a previous command.
setMIB             Set the value of a MIB object.
setup              Enter the 'Switch Setup' screen for basic switch
                   configuration.
-- MORE --, next page: Space, next line: Enter, quit: Control-C

```

When -- MORE -- appears, use the Space bar or [Return] to list additional commands.

Figure 4-4. Example of the Manager-Level Command Listing

When -- **MORE** -- appears, there are more commands in the listing. To list the next screenfull of commands, press the Space bar. To list the remaining commands one-by-one, repeatedly press [Enter].

Typing ? at the Global Configuration level or the Context Configuration level produces similar results.

Use [Tab] To Search for or Complete a Command Word. You can use [Tab] to help you find CLI commands or to quickly complete the current word in a command. To do so, type one or more consecutive characters in a command and then press [Tab] (with no spaces allowed). For example, at the Global Configuration level, if you press [Tab] immediately after typing “t”, the CLI displays the available command options that begin with “t”. For example:

```

ProCurve(config)# t [Tab]
tacacs-server
telnet-server
time
timesync
trunk
telnet
terminal
traceroute
ProCurve(config)# t

```

As mentioned above, if you type part of a command word and press **[Tab]**, the CLI completes the current word (if you have typed enough of the word for the CLI to distinguish it from other possibilities), including hyphenated extensions. For example:

```
ProCurve(config)# port-[Tab]
ProCurve(config)# port-security _
```

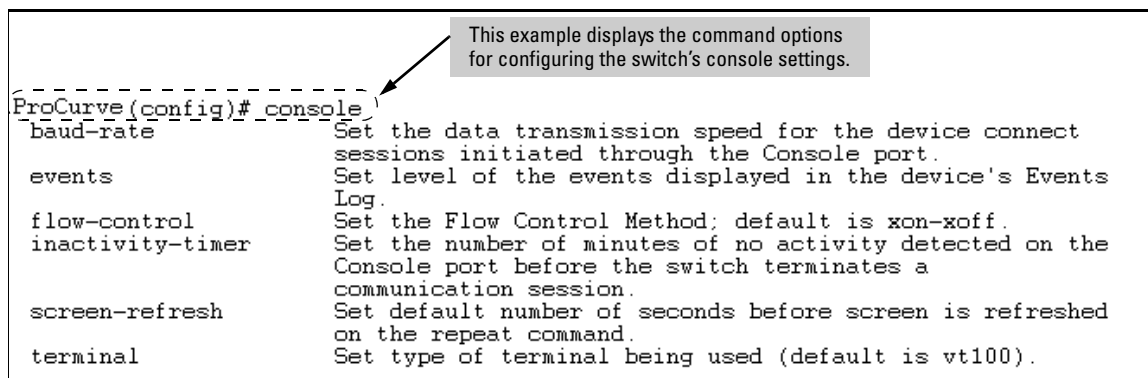
Pressing **[Tab]** after a completed command word lists the further options for that command.

```
ProCurve(config)# qos [Tab]

udp-portSet UDP port based priority.
tcp-portSet TCP port based priority.
device-priorityConfigure device-based priority.
dscp-mapDefine mapping between a DSCP
(Differentiated-Services Codepoint)
value and 802.1p priority.
type-of-serviceConfigure the Type-of-Service
method the device uses to
prioritize IP traffic.
```

Listing Command Options

You can use the CLI to remind you of the options available for a command by entering command keywords followed by **?**. For example, suppose you want to see the command options for configuring the console settings:



The screenshot shows a terminal window with the command `ProCurve(config)# console ?` entered. The output lists several options: `baud-rate`, `events`, `flow-control`, `inactivity-timer`, `screen-refresh`, and `terminal`. Each option is followed by a brief description of its function. A grey callout box with an arrow pointing to the command line contains the text: "This example displays the command options for configuring the switch's console settings."

```
ProCurve(config)# console ?
  baud-rate      Set the data transmission speed for the device connect
                 sessions initiated through the Console port.
  events         Set level of the events displayed in the device's Events
                 Log.
  flow-control   Set the Flow Control Method: default is xon-xoff.
  inactivity-timer Set the number of minutes of no activity detected on the
                 Console port before the switch terminates a
                 communication session.
  screen-refresh Set default number of seconds before screen is refreshed
                 on the repeat command.
  terminal       Set type of terminal being used (default is vt100).
```

Figure 4-5. Example of How To List the Options for a Specific Command

Displaying CLI “Help”

CLI Help provides two types of context-sensitive information:

- Command list with a brief summary of each command’s purpose
- Detailed information on how to use individual commands

Displaying Command-List Help.

Syntax: help

*Displays a listing of command Help summaries for all commands available at the current privilege level. That is, at the Operator level, executing **help** displays the Help summaries only for Operator-Level commands. At the Manager level, executing **help** displays the Help summaries for both the Operator and Manager levels, and so on.*

For example, to list the Operator-Level commands with their purposes:

```
ProCurve> help
enable          Enter the Manager Exec context.
exit            Return to the previous context or terminate current
               console/telnet session if you are in the Operator
               context level.
link-test       Test the connection to a MAC address on the LAN.
logout          Terminate this console/telnet session.
menu            Change console user interface to menu system.
ping            Send IP Ping requests to a device on the network.
show            Display switch operation information.
traceroute      Send traceroute to a device on the network.
```

Figure 4-6. Example of Context-Sensitive Command-List Help

Displaying Help for an Individual Command.

Syntax: < command-string > help

This option displays Help for any command available at the current context level.

For example, to list the Help for the **interface** command in the Global Configuration privilege level:

```
ProCurve(config)# interface help
Usage: [no] interface [ethernet] PORT-LIST [...]

Description: Enter the Interface Configuration Level, or execute one
              command for that level. Without optional parameters
              specified, the 'interface' command changes the context to
              the Interface Configuration Context Level for execution of
              configuration changes to the port or ports in the PORT-LIST.
              The 'interface [ethernet] PORT-LIST' can be followed by any
              command from the Interface Configuration Context Level in the
              same command line. In this case the context level is not
              changed, but the command is also executed for the port or ports
              in the PORT-LIST. Use 'interface [ethernet] PORT-LIST ?'
              to get a list of all valid commands.
```

Figure 4-7. Example of How To Display Help for a Specific Command

Note that trying to list the help for an individual command from a privilege level that does not include that command results in an error message. For example, trying to list the help for the **speed-duplex** command while at the global configuration level produces this result:

```
ProCurve# speed-duplex help
Invalid input: speed-duplex
```

Configuration Commands and the Context Configuration Modes

You can execute any configuration command in the global configuration mode or in selected context modes. However, using a context mode enables you to execute context-specific commands faster, with shorter command strings.

The switch offers interface (port or trunk group) and VLAN context configuration modes:

Port or Trunk-Group Context . Includes port- or trunk-specific commands that apply only to the selected port(s) or trunk group, plus the global configuration, Manager, and Operator commands. The prompt for this mode includes the identity of the selected port(s):

```
ProCurve(config)# interface c3-c6
ProCurve(eth-C5-C8)#

ProCurve(config)# interface trk1
ProCurve(eth-Trk1)#
```

*Commands executed at configuration level for entering port and **trk1** static trunk-group contexts, and resulting prompts showing port or static trunk contexts..*

```
ProCurve(eth-C5-C8)#
ProCurve(eth-Trk1)#

ProCurve(eth-C5-C8)# ?
ProCurve(eth-C5-C8)# ?
```

Lists the commands you can use in the port or static trunk context, plus the Manager, Operator, and context commands you can execute at this level.

The screenshot shows a CLI help menu for the command `ProCurve(eth-3-6)# ?`. The menu lists various configuration options with their descriptions. A callout box points to the first block of commands, stating: "In the port context, the first block of commands in the '?' listing show the context-specific commands that will affect only ports C3-C6." Another callout box at the bottom left points to the `interface` and `vlan` options, stating: "The remaining commands in the listing are Manager, Operator, and context commands." The menu also includes a footer: "-- MORE --, next page: Space, next line: Enter, quit: Control-C".

```
ProCurve(eth-3-6)# ?
|broadcast-limit  Set a broadcast traffic percentage limit.
|disable          Disable port(s).
|enable          Enable port(s).
|flow-control     Enable/disable flow control on the port(s).
|gvrp            Set the GVRP timers on the port (hundreths of a
|               second).
|lacp            Define whether LACP is enabled on the port, and whether
|               it is in active or passive mode when enabled.
|mdix-mode        Set port MDI/MDIX mode (default: auto).
|monitor         Define either the port is to be monitored or not.
|name            Set/unset a name for the port(s).
|qos             Set port-based priority.
|rate-limit      Enable/disable and configure rate-limiting for incoming
|               traffic on the port(s).
|speed-duplex    Define mode of operation for the port(s).
|unknown-vlans  Configure GVRP on the port(s).
-----
interface        Enter the Interface Configuration Level, or execute one
                 command for that level.
vlan             Add, delete, edit VLAN configuration or enter a VLAN
                 context.
-- MORE --, next page: Space, next line: Enter, quit: Control-C
```

Figure 4-8. Context-Specific Commands Affecting Port Context

VLAN Context . Includes VLAN-specific commands that apply only to the selected VLAN, plus Manager and Operator commands. The prompt for this mode includes the VLAN ID of the selected VLAN. For example, if you had already configured a VLAN with an ID of 100 in the switch:

```
ProCurve(config)# vlan 100
```

Command executed at configuration level to enter VLAN 100 context.

```
ProCurve(vlan-100)#
```

Resulting prompt showing VLAN 100 context.

```
ProCurve(vlan-100)# ?
```

Lists commands you can use in the VLAN context, plus Manager, Operator, and context commands you can execute at this level.

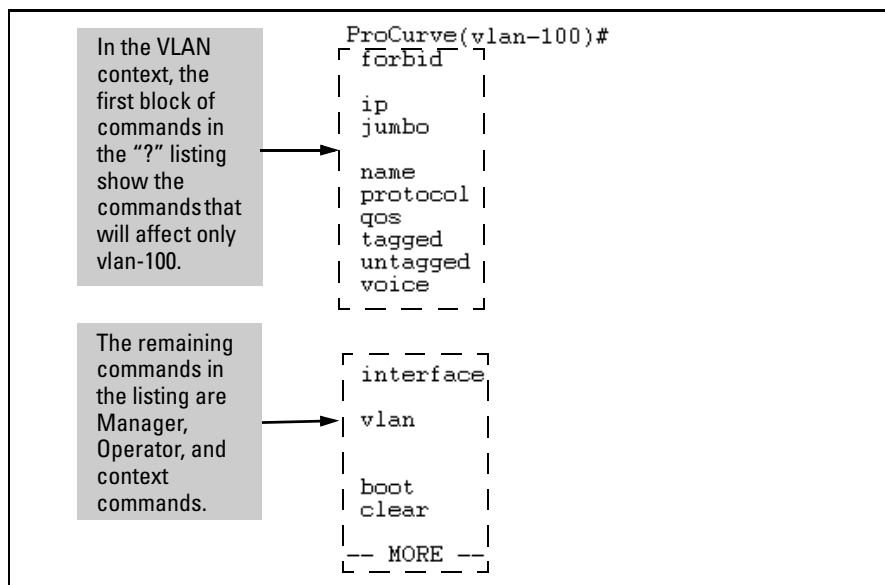


Figure 4-9. Context-Specific Commands Affecting VLAN Context

CLI Control and Editing

Keystrokes	Function
[Ctrl] [A]	Jumps to the first character of the command line.
[Ctrl] [B] or ←	Moves the cursor back one character.
[Ctrl] [C]	Terminates a task and displays the command prompt.
[Ctrl] [D]	Deletes the character at the cursor.
[Ctrl] [E]	Jumps to the end of the current command line.
[Ctrl] [F] or →	Moves the cursor forward one character.
[Ctrl] [K]	Deletes from the cursor to the end of the command line.
[Ctrl] [L] or [Ctrl] [R]	Repeats current command line on a new line.
[Ctrl] [N] or ↓	Enters the next command line in the history buffer.
[Ctrl] [P] or ↑	Enters the previous command line in the history buffer.
[Ctrl] [U] or [Ctrl] [X]	Deletes from the cursor to the beginning of the command line.
[Ctrl] [W]	Deletes the last word typed.
[Esc] [B]	Moves the cursor backward one word.
[Esc] [D]	Deletes from the cursor to the end of the word.
[Esc] [F]	Moves the cursor forward one word.
[Backspace]	Deletes the first character to the left of the cursor in the command line.
[Spacebar]	Moves the cursor forward one character.

Using the Command Line Interface (CLI)
CLI Control and Editing