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:

```
Password: _
```

**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# _
```
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

![Diagram of privilege levels]

### 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. (See figure.) 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)#
  ```
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Table 4-1. Privilege Level Hierarchy

<table>
<thead>
<tr>
<th>Privilege Level</th>
<th>Example of Prompt and Permitted Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operator Privilege</strong></td>
<td></td>
</tr>
<tr>
<td>Operator Level</td>
<td>ProCurve&gt; show &lt;command&gt; setup</td>
</tr>
<tr>
<td></td>
<td>ping &lt;argument&gt; link-test &lt;argument&gt;</td>
</tr>
<tr>
<td></td>
<td>enable</td>
</tr>
<tr>
<td></td>
<td>menu</td>
</tr>
<tr>
<td></td>
<td>logout</td>
</tr>
<tr>
<td></td>
<td>exit</td>
</tr>
<tr>
<td><strong>Manager Privilege</strong></td>
<td></td>
</tr>
<tr>
<td>Manager Level</td>
<td>ProCurve#</td>
</tr>
<tr>
<td>Global Configuration Level</td>
<td>ProCurve(config)#</td>
</tr>
<tr>
<td>Context Configuration Level</td>
<td>ProCurve(eth-5)# ProCurve(vlan-100)#</td>
</tr>
</tbody>
</table>
## How To Move Between Levels

<table>
<thead>
<tr>
<th>Change in Levels</th>
<th>Example of Prompt, Command, and Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operator level to Manager level</td>
<td>ProCurve&gt; enable</td>
</tr>
<tr>
<td></td>
<td>Password:_</td>
</tr>
<tr>
<td></td>
<td>After you enter enable, the Password prompt appears.</td>
</tr>
<tr>
<td></td>
<td>After you enter the Manager password, the system prompt</td>
</tr>
<tr>
<td></td>
<td>appears with the # symbol:</td>
</tr>
<tr>
<td></td>
<td>ProCurve#_</td>
</tr>
<tr>
<td>Manager level to Global configuration level</td>
<td>ProCurve# config</td>
</tr>
<tr>
<td></td>
<td>ProCurve(config)#</td>
</tr>
<tr>
<td>Global configuration level to a</td>
<td>ProCurve(config)# vlan 10</td>
</tr>
<tr>
<td>Context configuration level</td>
<td>ProCurve(vlan-10)#</td>
</tr>
<tr>
<td>Context configuration level to an</td>
<td>ProCurve(vlan-10)# interface e 3</td>
</tr>
<tr>
<td>other Context configuration level</td>
<td>ProCurve(int-3)#</td>
</tr>
<tr>
<td></td>
<td>The CLI accepts “e” as the abbreviated form of “ethernet”.</td>
</tr>
<tr>
<td>Move from any level to the</td>
<td>ProCurve(int-3)# exit</td>
</tr>
<tr>
<td>preceding level</td>
<td>ProCurve(config)# exit</td>
</tr>
<tr>
<td></td>
<td>ProCurve# exit</td>
</tr>
<tr>
<td></td>
<td>ProCurve&gt;</td>
</tr>
<tr>
<td>Move from any level to the</td>
<td>ProCurve(int-3)# end</td>
</tr>
<tr>
<td>Manager level</td>
<td>ProCurve#</td>
</tr>
<tr>
<td></td>
<td>—or—</td>
</tr>
<tr>
<td></td>
<td>ProCurve(config)# end</td>
</tr>
</tbody>
</table>

### 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:

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

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

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

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

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
termin
ttraceroute
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:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>baud-rate</td>
<td>Set the data transmission speed for the device connect sessions initiated through the Console port.</td>
</tr>
<tr>
<td>events</td>
<td>Set level of the events displayed in the device's Events Log.</td>
</tr>
<tr>
<td>flow-control</td>
<td>Set the Flow Control Method; default is xon-xoff.</td>
</tr>
<tr>
<td>inactivity-timer</td>
<td>Set the number of minutes of no activity detected on the Console port before the switch terminates a communication session.</td>
</tr>
<tr>
<td>screen-refresh</td>
<td>Set default number of seconds before screen is refreshed on the repeat command.</td>
</tr>
<tr>
<td>terminal</td>
<td>Set type of terminal being used (default is vt100).</td>
</tr>
</tbody>
</table>

This example displays the command options for configuring the switch's console settings.

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:
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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 `interface` 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.*
In the port context, the first block of commands in the “?” listing show the context-specific commands that will affect only ports C3-C6.

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](image)

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4-15
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CLI Control and Editing

CLI Control and Editing

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