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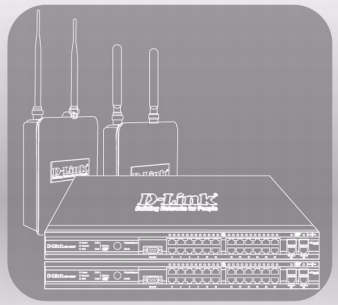

CLI Command Reference

Product Model: **DWL-x600AP**

Unified Wired and Wireless Access System

November 2011

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About This Document

In addition to the Web-based user interface, the D-Link Access Point DWL-x600AP includes a command-line interface (CLI) for administering the access point. The CLI lets you view and modify status and configuration information. This reference manual documents the commands and describes how to access and use the interface.

Note: This document contains both standalone and stacking commands. The stacking commands are available on the DWS-4000 Series Unified Switch.

Audience

This document is intended for the following audiences:

- System administrators who are responsible for configuring and operating the DWL-x600AP.
- Software engineers who integrate DWS-4000 software into their hardware platform can also benefit from a description of the configuration options.
- Level 1 and/or Level 2 support providers.

This document assumes that the reader has an understanding of the DWS-4000 software base and has read the appropriate specification for the relevant networking device platform. It also assumes that the reader has a basic knowledge of Ethernet and networking concepts.

Refer to the release notes for the DWS-4000 application-level code. The release notes detail the platform-specific functionality of the Switching, Routing, SNMP, Configuration, Management, and other packages. The suite of features the DWS-4000 packages support is not available on all the platforms to which DWS-4000 software has been ported.

Acronyms and Abbreviations

In most cases, acronyms and abbreviations are defined on first use.

Document Conventions

This section describes the conventions this document uses.

Note: A note provides more information about a feature or technology.

Caution! A caution provides information about critical aspects of the configuration, combinations of settings, events, or procedures that can adversely affect network connectivity, security, and so on.

This guide uses the typographical conventions described in Table 1.

Table 1: Typographical Conventions

Symbol	*Description*	*Example*
Bold	Click **Apply** to save your settings.	Menu titles, page names, and button names
Blue Text	Hyperlinked text.	See "About This Document" on page 7.
`courier font`	Command or command-line text	`show network`
`italic courier font`	`Variable value. You must replace the italicized text with an appropriate value, which might be a name or number.`	*value*
[] square brackets	`Optional parameter.`	`[value]`
{ } curly braces	Required parameter values. You must select a parameter from the list or range of choices.	`{choice1 | choice2}`
| Vertical bar	Separates the mutually exclusive choices.	`choice1 | choice2`
[{ }] Braces within square brackets	Optional parameter values. Indicates a choice within an optional element.	`[{choice1 | choice2}]`

Additional Documentation

The following documentation provides additional information about D-Link DWS-4000 Series software:

- The *D-Link DWS-4000 Series Administrator's Guide* describes the Web-based graphical user interface (GUI) for managing, monitoring, and configuring the switch. The *Administrator's Guide* also contains step-by-step configuration examples for several features.
- The *D-Link DWS-4000 Series Wired Configuration Guide* contains a variety of configuration examples that show how to configure the wired features on the switch.
- Release notes for this DWS-4000 Series product detail the platform-specific functionality of the software packages, including issues and workarounds.

About DWS-4000 Software

The DWS-4000 software has two purposes:

- Assist attached hardware in switching frames, based on Layer 2, 3, or 4 information contained in the frames.
- Provide a complete device management portfolio to the network administrator.

Scope

DWS-4000 software encompasses both hardware and software support. The software is partitioned to run in the following processors:

- CPU

  This code runs the networking device management portfolio and controls the overall networking device hardware. It also assists in frame forwarding, as needed and specified. This code is designed to run on multiple platforms with minimal changes from platform to platform.

- Networking device processor

  This code does the majority of the packet switching, usually at wire speed. This code is platform dependent, and substantial changes might exist across products.

Product Concept

Fast Ethernet and Gigabit Ethernet switching continues to evolve from high-end backbone applications to desktop switching applications. The price of the technology continues to decline, while performance and feature sets continue to improve. Devices that are capable of switching Layers 2, 3, and 4 are increasingly in demand. DWS-4000 software provides a flexible solution to these ever-increasing needs.

The exact functionality provided by each networking device on which the DWS-4000 software base runs varies depending upon the platform and requirements of the DWS-4000 software.

DWS-4000 software includes a set of comprehensive management functions for managing both DWS-4000 software and the network. You can manage the DWS-4000 software by using one of the following three methods:

- Command-Line Interface (CLI)
- Simple Network Management Protocol (SNMP)
- Web-based

Each of the DWS-4000 management methods enables you to configure, manage, and control the software locally or remotely using in-band or out-of-band mechanisms. Management is standards-based, with configuration parameters and a private MIB providing control for functions not completely specified in the MIBs.

Technical Support

D-Link provides customer access to the latest user documentation and software updates for D-Link products through its support website (http://support.dlink.com).

Section 1: Accessing the DWL-x600AP CLI

You can use any of the following methods to access the CLI for the access point or wireless network:

- Serial Port Connection to the AP
- Telnet Connection to the AP
- SSH Connection to the AP

Serial Port Connection to the AP

You can create a direct physical connection into the access point by connecting a cable from a laptop or desktop PC to a serial port on the access point. Then, using terminal emulation software on your PC, you can access the AP system console.

To emulate the AP system console on a serial port connection, you will need to have terminal emulation software installed on your PC, such as HyperTerminal or TeraTerm.

Use the following steps to set up the serial port connection, configure the terminal emulation software, and access the CLI.

1. Using a null-modem cable, connect a VT100/ANSI terminal or a workstation to the console (serial) port.
   - If you attached a PC, Apple, or UNIX workstation, start a terminal-emulation program, such as HyperTerminal or TeraTerm.
2. Configure the terminal-emulation program to use the following settings:
   - Baud rate: 115200 bps
   - Data bits: 8
   - Parity: none
   - Stop bit: 1
   - Flow control: none

Note: By default, the serial port baud rate is 115200. You can also configure the serial port to use a baud rate of 9600, 19200, 28400, or 57600 from the Web interface **Basic Settings** page or by using the `set serial baud-rate` *`rate`* command.

3. Press the return key, and a login prompt should appear.
   - The login name is **admin**, and the default password is **admin**.
   - After a successful login, the screen shows the (*Access Point Name*)# prompt. You are now ready to enter CLI commands at the command line prompt.

Telnet Connection to the AP

If you already deployed the network and know the IP address of your access point, you can use a remote Telnet connection to the access point to view the system console over the network.

Using Telnet tends to be more convenient than a serial port connection because it gives you remote access the AP system console. The only disadvantage of using Telnet (versus the direct serial port connection) is that with Telnet you cannot access the system console until the AP is fully initialized. Therefore, you cannot view AP startup messages. However, once the AP is operational you can use a Telnet connection to view the AP system console and enter CLI commands in exactly the same way as you would with a serial port connection. To use Telnet, you need a Telnet client, such as PuTTY.

To use the Microsoft Windows command window for Telnet access to the AP, use the following instructions:

1. Open a command window on your PC.

   For example, from the system tray on the desktop choose **Start Run** to bring up the Run dialog, type **cmd** in the Open property, then click **OK**.

2. At the command prompt, type the following:
   `telnet ip_address`
   - where `ip_address` is the address of the access point you want to monitor.
   - (If your Domain Name Server is configured to map domain names to IP addresses via DHCP, you can also telnet to the domain name of the AP.)

3. When the login prompt appears, enter the username and password.
   - The login name is **admin**, and the default password is **admin**.
   - After a successful login, the screen shows the (*Access Point Name*)# prompt. You are now ready to enter CLI commands at the command line prompt.

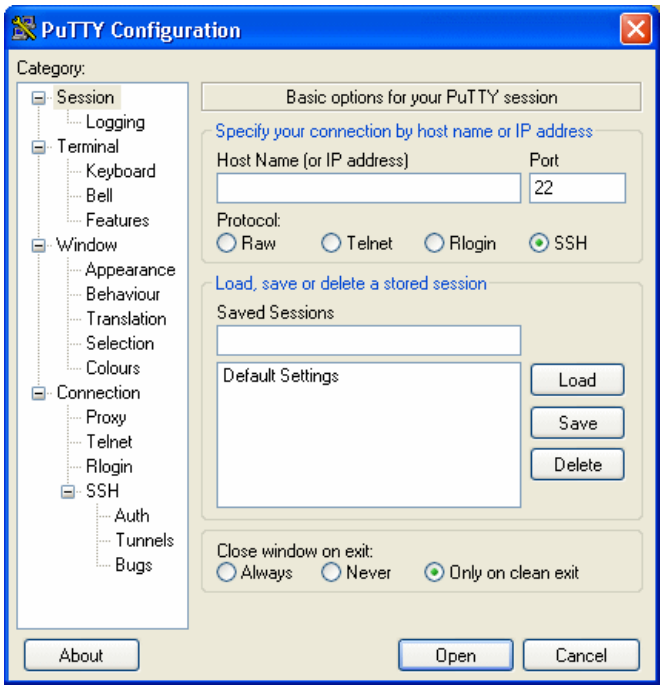
SSH Connection to the AP

If you already deployed your network and know the IP address of your access point, you can use a remote Secure Shell (SSH) connection to the access point to view the system console over the network.

Using an SSH connection to the access point is similar to Telnet in that it gives you remote access to the system console and CLI. SSH has the added advantage of being a secure connection with encrypted traffic.

To use an SSH connection, you need to have SSH software installed on your PC. The examples in this guide use PuTTY, which is available as a free Internet download.

1. Start your SSH application.



2. Enter the IP address of access point and click **Open**.

   (If your Domain Name Server is configured to map domain names to IP addresses via DHCP, you can enter the domain name of the AP instead of an IP address.)

   This brings up the SSH command window and establishes a connection to the access point. The login prompt is displayed.

3. When the login prompt appears, enter the username and password.
   - The default login name is **admin**. If you did not change the default password, press **Enter** when you are prompted for a password. The default password is blank.
   - After a successful login, the screen shows the *`Access Point Name#`* prompt. You are now ready to enter CLI commands at the prompt.

Section 2: Commands and Syntax

Configuration information for the DWL-x600AP is represented as a set of classes and objects. The CLI for the DWL-x600AP provides the following commands for manipulating objects:

- get
- set
- add
- remove

Caution! Settings that you update using the CLI get, set, add, and remove commands are not saved to the startup configuration unless you explicitly save them using the `save-running` command. For a description of configurations maintained on the AP and details on how to save your updates, see "Saving Configuration Changes" on page 21.

The following sections describe the function of each command.

Using the get Command

The `get` command enables you to view the property values of existing instances of a class. Classes can be "named" or "unnamed." The command syntax is:

```
get unnamed-class [property ... | detail]
get named-class [instance | all [property ... | name | detail]]
```

The rest of the command line is optional. If provided, it is either a list of one or more *properties*, or the keyword `detail`.

The following example uses the `get` command on an unnamed class with a single instance:

```
get log
```

There is only one log on the AP, so the command returns information on the log file.

The following example uses the `get` command on an unnamed class with multiple instances:

```
get log-entry
```

There are multiple log entries but they are not named in the command, so this command returns all log entries.

The following example uses the `get` command on a named class with multiple instances:

```
get bss wlan0bssvap0
```

There are multiple BSSes and they are named in the command, so this command returns information on the BSS named *wlan0bssvap0*.

The following example uses the `get` command on a named class to get all instances:

```
get mac-acl all mac
get mac-acl all
```

Note: The name *wlan0bssvap0* refers to the basic service set (BSS) on the wlan0 interface. For information on interfaces, see "Interface Naming Conventions" on page 20.

Using the Set Command

The `set` command enables you to set the property values of existing instances of a class. It has the following syntax:

```
set unnamed-class [with qualifier-property qualifier-value ... to] property value . . .
```

The first argument is an unnamed class in the configuration. Following the argument is an optional qualifier that restricts the set to only some instances. For singleton classes (with only one instance) no qualifier is needed. A qualifier starts with the keyword `with`, and has a sequence of one or more *qualifier-property qualifier-value* pairs, and ends with the keyword `to`. If these are included, then only instances whose present value of *qualifier-property* is *qualifier-value* will be set. The *qualifier-value* arguments cannot contain spaces. Therefore, you cannot select instances whose desired *qualifier-value* has a space in it.

The rest of the command line contains *property-value* pairs.

```
set named-class instance | all [with qualifier-property qualifier-value ... to] property value...
```

The first argument is either a named class in the configuration.

The next argument is either the name of the *instance* to set, or the keyword `all`, which indicates that all instances should be set. Classes with multiple instances can be set consecutively in the same command line, as shown in Example 4 below. The *qualifier-value* arguments cannot contain spaces.

The following examples show `set` commands.

- `set interface wlan0 ssid "Vicky's AP"`
- set radio all beacon-interval 200
- set tx-queue wlan0 with queue data0 to aifs 3
- set tx-queue wlan0 with queue data0 to aifs 7 cwmin 15 cwmax 1024 burst 0
- set vap vap2 with radio wlan0 to vlan-id 123

Note: For information on interfaces used in this example (such as wlan0 or vap2) see "Interface Naming Conventions" on page 20.

Using the add Command

The `add` command enables you to add a new instance or group of instances of a class and has the following syntax:

```
add unique-named-class instance [property value ... ]
add group-named-class instance [property value ... ]
add anonymous-class [property value ... ]
```

For example:

```
add mac-acl default mac 00:01:02:03:04:05
```

Note: To add an instance to a uniquely named class, you must assign the instance a name that is not already in use by another instance of that class. If you add instances to group-named classes, you can form groups by creating instances and assigning them identical names. All instances of a group-named class that have the same name form a group of instances.

Using the remove Command

The `remove` command enables you to remove an existing instance of a class. It has the following syntax:

```
remove unnamed-class [property value . . . ]
remove named-class instance | all [property value . . .]
```

For example:

```
remove mac-acl default mac 00:01:02:03:04:05
```

Additional CLI Commands

The CLI also includes the following commands for maintenance tasks:

Table 2: Additional CLI Commands

Command	*Description*
`save-running`	The `save-running` command saves the running configuration as the startup configuration. For more information, see "Saving Configuration Changes" on page 21.
`reboot`	The `reboot` command restarts the access point (a "soft" reboot).
`factory-reset`	The `factory-reset` command resets the AP to factory defaults and reboots.
`firmware-upgrade`	Use the `firmware-upgrade` command to upload a new AP image.
`config`	Use the `config` command to upload or download the AP configuration file.

Table 2: Additional CLI Commands (Cont.)

Command	*Description*
`packet-capture`	Download the packet capture file.

For information about classes, instances, and properties, see "CLI Classes and Properties Reference" on page 32.

Getting Help on Commands at the CLI

The CLI provides keyboard shortcuts to help you navigate the command line and build valid commands, along with tab completion hints on available commands that match what you have typed so far. Using the CLI will be easier if you use the tab completion help and learn the keyboard shortcuts.

Tab Completion

Help on commands can be requested at the CLI by using the Tab key. This is a quick way to see all valid completions for a class. Entering **Tab** once and the CLI will attempt to complete the current command.

If multiple completions exist, a beep will sound and no results will be displayed. Enter **Tab** again to display all available completions.

Example 1: At a blank command line, enter **Tab** twice to get a list of all commands.

```
WLAN-AP#
add                 Add an instance to the running configuration
config              Upload/Download the running configuration
dot1x-cert          Upload the dot1x certificate file
factory-reset       Reset the system to factory defaults
firmware-upgrade    Upgrade the firmware
get                 Get property values of the running configuration
packet-capture      Download the packet capture file
reboot              Reboot the system
remove              Remove instances in the running configuration
save-running        Save the running configuration
set                 Set property values of the running configuration
```

Example 2: Type `remove` **Tab Tab** (including a space after `remove`) for a list of all property options for the `remove` command.

```
WLAN-AP# remove
acl                     Create ACL.
basic-rate              Basic rates of radios
bridge                  Brtrunk port
bridge-port             Bridge ports of bridge interfaces
bss                     Basic Service Set of radios
class-map               Creates a Diffserv class.
interface               Network interface
known-ap-config         Configurable list of known access point
```

```
mcs-index                MCS Index of radios
policy-map               Creates a Diffserv policy.
qos-mac-acl              Create MAC-ACL.
scheduler-profile        Scheduler Profile
scheduler-profile-list   Scheduler Profile List
snmp-group               SNMP user groups
snmp-target              SNMPv3 targets to receive traps
snmp-user                SNMPv3 users
snmp-view                SNMP MIB views
supported-rate           Supported rates of radios
traphost                 Destination host for SNMP trap
WLAN-AP# remove
```

Example 3: Type the following:

`get system v` **`Tab.`**

This will result in completion with the only matching property, `get system version`. Press **Enter** to display the output results of the command.

Keyboard Shortcuts

The CLI provides keyboard shortcuts to help you navigate the command line and build valid commands. Table 3 describes the keyboard shortcuts available from the CLI.

Table 3: Keyboard Shortcuts

Keyboard Shortcut	*Action on CLI*
Ctrl-a	Move the cursor to the beginning of the current line.
Ctrl-e	Move the cursor to the end of the current line.
Ctrl-b Left Arrow key	Move the cursor back on the current line, one character at a time.
Ctrl-f Right Arrow Key	Move the cursor forward on the current line, one character at a time.
Ctrl-c	Start over at a blank command prompt (abandons the input on the current line).
Ctrl-h Backspace	Remove one character on the current line.
Ctrl-w	Remove the last word in the current command. (Clears one word at a time from the current command line, always starting with the last word on the line.)
Ctrl-k	Remove characters starting from cursor location to end of the current line. (Clears the current line from the cursor forward.)
Ctrl-u	Remove all characters before the cursor. (Clears the current line from the cursor back to the CLI prompt.)
Ctrl-p Up Arrow key	Display previous command in history. (Ctrl-p and Ctrl-n let you cycle through a history of all executed commands like Up and Down arrow keys typically do. Up/Down arrow keys also work for this.)
Ctrl-n Down Arrow key	Display next command in history. (Ctrl-p and Ctrl-n let you cycle through a history of all executed commands like Up and Down arrow keys typically do. Up/Down arrow keys also work for this.)
Ctrl-d	Exit the CLI. (At a blank command prompt, typing Ctrl-d closes the CLI.) (Typing Ctrl-d within command text also removes characters, one at a time, at cursor location like Ctrl-h.)

Section 3: Interface Naming Conventions

The following summary of interface names is provided to help clarify the related CLI commands and output results. These names are not exposed on the Web UI, but are used throughout the CLI. You get and set many configuration values on the AP by referring to interfaces. In order to configure the AP through the CLI, you need to understand which interfaces are available on the AP, what role they play (corresponding settings on the Web UI), and how to refer to them. To view a list of the interface names and an associated description, use `get interface all description`.

Table 4 describes the interface naming conventions for the WLAN AP.

Note: Use the `get interface` command to display common information on all interfaces, including IP addresses.

Table 4: Interface Naming Convention

Interface	*Description*
brtrunk	Internal bridge trunk interface.
lo	Local loopback for data meant for the access point itself.
eth0	The Ethernet interface connected to the Internal network.
wlan0	The default wireless interface on radio 1. This is the interface for virtual access point (VAP) 0.
wlan1	The default wireless interface on radio 2. This is the interface for VAP 0.
wlan0vap*x*	The wireless interface for the *x* VAP on radio 1. The value for *x* ranges from 1–15.
wlan1vap*x*	The wireless interface for the *x* VAP on radio 2. The value for *x* ranges from 1–15.
wlan0bssvap*x*	The basic service set interface for the x VAP on radio 1. The value for *x* ranges from 0–15.
wlan1bssvap*x*	The basic service set interface for the x VAP on radio 2. The value for *x* ranges from 0–15.
wlan0wds*x*	A wireless distribution system (WDS) interface where *x* indicates the number of the WDS link. The WDS interface allows you to configure wireless bridging and repeating. The value for *x* ranges from 0–3.

Note: The commands and examples in this appendix use radio 1. To configure and view information about the second radio, replace the *wlan0* portion of the interface name with *wlan1*. Use the command `get radio all` to view information about the radios on the WLAN AP.

Section 4: Saving Configuration Changes

The DWL-x600AP maintains three different configurations:

- **Factory Default Configuration** — This configuration consists of the default settings shipped with the access point.
  - You can always return the AP to the factory defaults by using the `factory-reset` command.
- **Startup Configuration** — The startup configuration contains the settings with which the AP will use the next time it starts up (for example, upon reboot).
  - To save configuration updates made from the CLI to the startup configuration, you must execute the `save-running` or `set config startup running` command from the CLI after making changes.
- **Running Configuration** — The running configuration contains the settings with which the AP is currently running.
  - When you view or update configuration settings through the CLI using `get`, `set`, `add`, and `remove` commands, you are viewing and changing values on the running configuration only. If you do not save the configuration (by executing the `save-running` or `set config startup running` command at the CLI), you will lose any changes you submitted via the CLI upon reboot.
  - The `save-running` command saves the running configuration as the startup configuration. (The `save-running` command is a shortcut command for `set config startup running`, which accomplishes the same thing.)
  - Settings updated from the CLI (using the `get`, `set`, `add`, and `remove` commands) are not saved to the startup configuration unless you explicitly save them via the `save-running` command. This gives you the option of maintaining the startup configuration and trying out values on the running configuration that you can discard (by not saving).
  - By contrast, configuration changes updated from the Web UI are automatically saved to both the running and startup configurations. If you make changes from the Web UI that you do not want to keep, your only option is to reset to factory defaults. The previous startup configuration will be lost.

Section 5: Access Point CLI Commands

This section describes some of the commands you use to view and configure the DWL-x600AP.

Note: This section does not describe every command available from the DWL-x600AP CLI. The DWL-x600AP is intended to be configured primarily from the Web interface.

The CLI performs validation on individual property values in a `set` or `add`, but does not check to see if different property values are consistent with each other. For example, it would not provide any error if a radio's mode was set to “a” and its channel was set to “1”. (Even though “1” is not a valid channel in “a” mode, it is a valid channel in “g” mode.) In cases where the configuration is left in an inconsistent state, the services associated with the configuration may not be operational. Therefore, it is important to consult the class and property reference to understand the acceptable values for properties given the values of other properties. For more information, see “CLI Classes and Properties Reference” on page 32.

Basic Settings

The following CLI command examples correspond to tasks you can accomplish on the Basic Settings tab of the Web UI for access points.

Note: Before you configure the basic settings, make sure you are familiar with the names of the interfaces as described in “Interface Naming Conventions” on page 20. The interface name you reference in a command determines whether a setting applies to a wired or wireless interface, the Internal network, or to radio “one” or radio “two”.

Table 5: Basic Settings Commands

Action	*Command*
View the following information about the management interface on the AP: • VLAN ID • Interface name • Static IP address (if DHCP is not used) • Static subnet mask • IP address • Subnet mask • MAC address • DHCP status • IPv6 status • IPv6 auto configuration status • Static IPv6 address • Static IPv6 prefix length	`get management`
View the firmware version.	`get system version`
View the serial number.	`get system serial-number`
Set the password.	`set system password` *`password`* Example: `set system password test1234`
Set the baud rate for the serial port.	`set serial baud-rate`
Set the system name.	`set system system-name` *`name`* Example: `set system system-name "AEO AP"`
Set the system location.	`set system system-location` *`location`*
Set the administrator's contact information.	`set system system-contact` *`contact_info`*
Set the time zone.	`set system time-zone` *`time zone`* Example: `set system time-zone "USA (Alaska)"`
Enable or disable the Aeroscout feature, which is used to perform location detection.	`set aeroscout admin-mode {up | down}`
Enable the Bonjour protocol to allow discovery of services offered by other Bonjour-enabled devices on the network.	`set bonjour status {up | down}`

Status

Use the commands in this section to view various AP status information.

Note: Make sure you are familiar with the names of the interfaces as described in "Interface Naming Conventions" on page 20. The interface name you reference in a get command determines whether the command output shows a wired or wireless interface, the Internal network, or to radio "one" or radio two."

Table 6: Status Commands

Action	*Command*
Global command to get all details on the Basic Service Set (BSS). This is a useful command to use to get a comprehensive picture of how the AP is currently configured.	`get bss all detail`
Get information about the wired and WLAN interfaces.	`get interface`
Get the MAC address for the wired internal interface.	`get interface wlan0 mac`
Get the VLAN ID for the wired interface.	`get management vlan-id`
Get the network name (SSID) for the default virtual access point.	`get interface wlan0 ssid`
Get the current IEEE 802.11 radio mode.	`get radio wlan0 mode`
Get the channel the AP is currently using.	`get radio wlan0 channel`
Get basic radio settings for the internal interface.	`get radio wlan0 [detail]`
Get client associations.	`get association detail`
Get neighboring access points.	`get detected-ap detail`
Get information about switches that can discover and manage the AP.	`get managed-ap`
See the administrative status of the Aeroscout feature.	`get aeroscout admin-mode`
See the administrative status of the Bonjour protocol.	`get bonjour status`
See the configured time zone.	`get system time-zone`

Ethernet Settings

Use the commands in this section to view and set values for the Ethernet (wired) interface.

Note: Before configuring this feature, make sure you are familiar with the names of the interfaces as described in "Interface Naming Conventions" on page 20. The interface name you reference in a command determines whether a setting applies to a wired or wireless interface, the Internal network, or to radio "one" or radio "two"

Table 7: Ethernet Settings Commands

Action	*Command*
Get a summary view of internal interfaces	`get bss`
Get the DNS host name for the AP.	`get host id`

Set the DNS host name for the AP.	`set host id host_name`
	Example:
	`set host id vicky-ap`

Get current settings for the Ethernet (wired) internal interface.	`get management`
Set the management VLAN ID.	`set management vlan-id 1-4096`
View untagged VLAN information.	`get untagged-vlan`
Enable the untagged VLAN.	`set untagged-vlan status up`
Disable the untagged VLAN.	`set untagged-vlan status down`
Set the untagged VLAN ID.	`set untagged-vlan vlan-id 1-4096`
View the connection type.	`get management dhcp-status`
Use DHCP as the connection type.	`set management dhcp-status up`
Use a static IP as the connection type.	`set management dhcp-status down`

Set the static IP address.	`set management static-ip ip_address`
	Example:
	`set management static-ip 10.10.12.221`

Set a subnet mask.	`set management static-mask netmask`
	Example:
	`set management static-mask 255.255.255.0`

Set the default gateway.	`set static-ip-route gateway ip_address`
	Example:
	`set static-ip-route gateway 10.10.12.1`

View the DNS name server mode: Dynamic — up Manual — down	`get host dns-via-dhcp`

Table 7: Ethernet Settings Commands (Cont.)

Action	*Command*

Set DNS name servers to use static IP addresses (dynamic to manual mode).	`set host dns-via-dhcp down`
	`set host static-dns-1 ip_address`
	`set host static-dns-2 ip_address`
	Example:
	`set host static-dns-1 192.168.23.45`

Set DNS name servers to use DHCP IP addressing (manual to dynamic mode).	`set host dns-via-dhcp up`
Set the IPv6 admin mode.	`set management ipv6-status {up | down}`
Set the IPv6 autoconfig admin mode.	`set management ipv6-autoconfig-status {up | down}`
Set the static IPv6 address.	`set management static-ipv6 ipv6_address`
Set the static IPv6 prefix length.	`set management static-ipv6-prefix-length 0–128`
View the IPv6 autoconfigured global addresses.	`get management autoconfig-ipv6-global-all`
Set the default IPv6 Gateway.	`set static-ipv6-route gateway ipv6_address`

Radio Settings

Table 8 shows the Radio commands. The commands in this table use radio one (`wlan0`). To change the wireless settings for radio two, use `wlan1`.

Table 8: Radio Settings Commands

Action	*Command*
View a description of the radio interfaces.	`get radio all description`
Turn the radio on/off.	`set radio wlan0 status {on | off}`
Enable or disable 802.11d regulatory domain support.	`set dot11 dot11d {up | down}`
Enable or disable station isolation.	`set radio wlan0 station-isolation {on | off}`
View the current radio mode.	`get radio wlan0 mode`
Set the radio mode to IEEE 802.11a.	`set radio wlan0 mode a`
Set the radio mode to IEEE 802.11a/n.	`set radio wlan0 mode a-n`
Set the radio mode to IEEE 802.11b/g.	`set radio wlan0 mode bg`
Set the radio mode to IEEE 802.11b/g/n	`set radio wlan mode bg-n`
Set the radio mode to 2.4 GHz IEEE 802.11n.	`set radio wlan0 mode n-only-g`
Set the radio mode to 5 GHz IEEE 802.11n .	`set radio wlan0 mode n-only-a`
View the radio channel.	`get radio wlan0 channel`
Set the radio channel to a static channel.	`set radio wlan0 channel-policy static` `set radio wlan0 static-channel channel`
Set the radio channel to “auto”	`set radio wlan0 channel-policy best`

Table 8: Radio Settings Commands (Cont.)

Action	*Command*
Set the channel bandwidth.	`set radio wlan0 n-bandwidth {20 | 40}`
Set the primary channel.	`set radio wlan0 n-primary-channel {lower | upper}`
Set the channel protection.	`set radio wlan0 protection {auto |off}`
Set the Beacon interval.	`set radio wlan0 beacon-interval 20-1000`
Set the DTIM interval.	`set radio wlan0 dtim-period 1-255`
Set the fragmentation length threshold.	`set radio wlan0 fragmentation-threshold 256-2346`
Set the RTS threshold.	`set radio wlan0 rts-threshold 0-2347`
Set the maximum number of clients allowed to associate (VAP 0 radio 0).	`set bss wlan0bssvap0 max-stations 0-200`
Set the power transmission level (percent).	`set radio wlan0 tx-power 0-100`
Set the fixed multicast rate.	`set radio wlan0 fixed-multicast-rate {54 | 48 |36 |24 | 18 | 12 |9 | 6 | auto}`
Add a basic rate set.	`add basic-rate wlan0 rate integer`
Get current basic rates.	`get basic-rate`
Add supported rate.	`add supported-rate wlan0 rate integer`
Get current supported rates.	`get supported-rate wlan0`
Get the current MCS index settings.	`get mcs-index`
Enable an MCS index on a radio.	`add mcs-index wlan0 index 0-15`
Disable an MCS index on a radio.	`remove mcs-index wlan0 index 0-15`
Enable or disable broadcast/multicast rate limiting.	`set radio wlan0 rate-limit-enable {on | off}`
Set the rate limit (packets per second).	`set radio wlan0 rate-limit limit`
Set the rate limit burst (packets per second).	`set radio wlan0 rate-limit-burst limit`
Set the STBC.	`set radio wlan0 stbc-mode {on | off}`
Set the short guard interval.	`set radio wlan0 short-guard-interval-supported {yes | no}`

Managed Access Point

You can use a D-Link Unified Switch to manage one or more access points on your network. To allow a switch to manage the AP the switch and AP must discover each other. The commands in Table 9 show how to change the AP mode from Standalone to Managed and how to configure the IP address of a D-Link Unified Switch so that the AP can discover it. You can configure a pass phrase on the AP and on the switch so that only authenticated APs can associate with the switch.

Table 9: Managed Access Point Commands

Action	*Command*
View managed AP settings.	`get managed-ap`

Table 9: Managed Access Point Commands (Cont.)

Action	Command
Set the AP to Managed mode.	`set managed-ap mode {up | down}`
Set the pass phrase for AP-to-switch authentication.	`set managed-ap pass-phrase password` **Note:** The password you enter must match the local authentication password you configure for Valid APs on the D-Link Unified Switch. To remove the password, enter the command without the password variable.

Configure the IP address of up to four D-Link Unified Switches on your network.	`set managed-ap switch-address-1 ip_address`
	`set managed-ap switch-address-2 ip_address`
	`set managed-ap switch-address-3 ip_address`
	`set managed-ap switch-address-4 ip_address`
	Example:
	`set managed-ap switch-address-1 192.168.2.123`

IEEE 802.1X Supplicant Authentication

Use the 802.1X Supplicant Authentication settings to configure the access point to authenticate to a secured wired network.

Table 10: IEEE 802.1X Supplicant Commands

Action	Command
Enable and disable the 802.1X supplicant.	`set dot1x-supplicant status {up | down}`
Set the 802.1X user name.	`set dot1x-supplicant user name`
Set the 802.1X password.	`set dot1x-supplicant password password`

Firmware and Configuration File Management

Table 11 shows the commands you use to manage the configuration file and firmware on the AP.

Table 11: System Management

Action	*Command*
Restore the factory default settings.	`factory-reset`
Save the configuration to a backup file.	`config download` *`url`* Example: `config download tftp://1.2.3.4/defaultcfg.xml`
Restore the configuration from a previously saved file.	`config upload` *`url`* Example: `config upload tftp://1.2.3.4/defaultcfg.xml`
Reboot the system.	`reboot`

Upgrade the firmware (requires a reboot).	`firmware-upgrade` *`url`*
	Example:
	`firmware-upgrade tftp://1.2.3.4/upgrade.tar`
	`firmware-upgrade file://1.2.3.4/tmp/upgrade.tar`

Radio and VAP Scheduler

The Radio and VAP Scheduler feature allows the user to automate the enabling or disabling of radios and VAPs based on configured time intervals. One of the use cases of this feature is that radios can be scheduled to operate only during the office working hours to achieve security and reduce power consumption. Another use case is to allow access to VAPs for wireless clients only during specific times of a day.

Table 12 shows the commands you use to create and enable schedule profiles.

Table 12: Radio and VAP Scheduler

Action	*Command*
Create a profile to the list of available scheduler profiles by assigning a name and an index.	`add scheduler-profile-list` *`profile-name`* `index` *`1-16`*

Add a rule to a scheduler profile that specifies the day of the week (or every weekday) and the time when the rule will be in effect.	`add scheduler-profile` *`scheduleprofile-name`* `day {weekday |` *`day of the week`*`}` `Start` *`00:00-24:00`* `End` *`00:00-24:00`*
	Examples:
	`add scheduler-profile profile1 day weekday start 09:00 end 13:00`
	
	`add scheduler-profile profile1 day monday start 14:00 end 22:00`

Table 12: Radio and VAP Scheduler

Action	*Command*

Configure a radio and a VAP to use a scheduler profile.	`set radio radio-instance scheduler-profile-name profile-name`
	
	`set vap vap-instance scheduler-profile-name profile-name`

Enable or disable the scheduler administrative mode.	`set scheduler-config mode {up | down}`
Remove all profiles or a specified profile from the scheduler profile list and delete all its rules.	`remove scheduler-profile-list {all | profile-name}`
Remove all profiles.	`remove scheduler-profile-list`
Remove a specified profile.	`remove scheduler-profile-list profile-name`
Remove a rule from a specified profile.	`remove scheduler-profile-list profile-name with rule=1`
View the scheduler configuration.	`get scheduler-config`
Display the contents of all the profiles.	`get scheduler-profile`
Display the radio operational mode.	`get radio radio-instance operational-mode`
Display the VAP operational mode.	`get radio vap-instance operational-mode`

Rogue APs Traps and Email Alerts

The AP can detect and log rogue APs. The list of rogue APs can be stored as syslog messages and can be emailed to a designated address. They can also be stored as SNMP traps.

You can also configure the AP to send email alerts upon other syslog messages, if their severity level meets a configured threshold.

Note: The Rogue AP logging and email alert features are operational only when the AP is in standalone mode. They are disabled when the AP is managed.

Table 13 shows the commands you use to create and enable schedule profiles.

Table 13: Rogue APs and Email Alerts

Action	*Command*
Configure an smtp-server.	`set email-alert smtp-server server-address`
Configure a server with the below parameters.	`set email-alert server-security {open | TLSv1}`
Configure SMTP server port.	`set email-alert server-port port`
Configure SMTP server user name as an alphanumeric string up to 64 characters. This is used when the security is TLSv1.	`email-alert server-username username`

Table 13: Rogue APs and Email Alerts

Action	*Command*
Configure the SMTP server password up to 64 characters (including special characters).	`set email-alert server-password password`
Configure email-alert mode to enable/disable email alert service.	`set email-alert mode {up | down}`
Configure the email-alert log severity level, from 0 (emergency) to 7 (debug). The syslog messages whose severity levels either match or greater than the configured level are sent in the email message. If *none* is set, then periodic emails are not sent.	`set email-alert log-severity {none | 0-7}`
Configure the email-alert urgent severity level. Syslog messages whose severity levels either match or are greater than the configured level are sent immediately in an email message. If none is set, then no emails are sent urgently.	`set email-alert urgent-severity {none | 0-7}`
Configure the address from which email alerts are sent. If it is not configured, then email messages are not sent.	`set email-alert from-addr email-addr`
The amount of time in minutes when email alert service will send the stored syslog log messages periodically.	`set email-alert log-duration minutes`
Configure the subject line text for email-alerts, up to 255 alphanumeric characters.	`email-alert subject <string>`

Configure email-alert addresses.	`set email-alert to-addr-1 email-addr`
	`set email-alert to-addr-2 email-addr`
	`set email-alert to-addr-3 email-addr`

Send test mail to validate the SMTP server configuration.	`set email-alert test-mail enable`
Displays summary or detailed information on the email alert feature.	`get email-alert [detail]`

Section 6: CLI Classes and Properties Reference

Configuration information for the D-Link Access Point is represented as a set of classes and objects. The following is a general introduction to the CLI classes and properties.

Different kinds of information uses different classes. For example, information about a network interface is represented by the "interface" class, while information about an NTP client is represented by the "ntp" class.

Depending on the type of class, there can be multiple instances of a class. For example, there is one instance of the "interface" class for each network interface the AP offers (Ethernet, radio, and so on), while there is just a singleton instance of the "ntp" class, since an AP needs only a single NTP client. Some classes require their instances to have names to differentiate between them; these are called *named classes*. For example, one interface might have a name of `eth0` to indicate that it is an Ethernet interface, whereas another interface could have a name of `wlan0` to indicate it is a wireless LAN (WLAN) interface. Instances of singleton classes do not have names, since they have only a single instance. Classes that can have multiple instances but do not have a name are called anonymous classes. Together, singleton and anonymous classes are called unnamed classes. Some classes require their instances to have names, but the multiple instances can have the same name to indicate that they are part of the same group. These are called group classes.

Table 14: CLI Class Instances

has name? \ # of instances?	*one*	*multiple*
no	singleton	anonymous
yes — unique	n/a	unique named
yes — non-unique	n/a	group named

Each class defines a set of properties that describe the actual information associated with a class. Each instance of a class has a value for each property that contains the information. For example, the interface class has properties such as "ip" and "mask." For one instance, the `ip` property might have a value of 192.168.1.10 while the `mask` property has a value of 255.255.255.0; another instance might have an `ip` property with a value of 10.0.0.1 and `mask` property with a value of 255.0.0.0. To view the IP address and mask for a specific interface, you must identify the instance in the command.

The following table is a comprehensive list of all classes and their properties. Some of the commands allow you to view or configure settings that are not available from the Web interface. Use `get` or `set` to build commands based on the class and property. If the class is a named class, you must include the name. For example, *interface* is a named class.

Table 15: D-Link Access Point CLI Classes and Properties

Class	*Property*
acl	acl-type rule-count

Table 15: D-Link Access Point CLI Classes and Properties (Cont.)

Class	*Property*
aeroscout	admin-mode down admin-mode up detail
association	acl-down acl-up acl-type-up acl-type-down associated authenticated bw-limit-down bw-limit-up client-qos-enabled interface last-rssi listen-interval policy-down policy-up rx-bytes rx-packets station tx-bytes tx-packets
basic-rate	rate
bonjour	status down status up
bridge-port	interface path-cost priority stp-state

Table 15: D-Link Access Point CLI Classes and Properties (Cont.)

Class	*Property*
bss	broadcast-key-refresh-rate
	description
	ignore-broadcast-ssid
	open-system-authentication
	radio
	radius-accounting
	radius-backupone-ip
	radius-backupone-key
	radius-backupthree-ip
	radius-backupthree-key
	radius-backuptwo-ip
	radius-backuptwo-key
	radius-ip
	radius-ip-network
	radius-ipv6
	radius-key
	rsn-preauthentication
	session-key-refresh-rate
	shared-key-authentication
	status
	vlan-tagged-interface
	wpa-allow-non-wpa-stations
	wpa-allowed
	wpa-cipher-ccmp
	wpa-cipher-tkip
	wpa2-allowed
channel-planner	change-threshold
	interval
	locked-ips
	status

Table 15: D-Link Access Point CLI Classes and Properties (Cont.)

Class	*Property*
class-map	cos
	detail
	dst-ip
	dst-ip-mask
	dst-ipv6
	dst-ipv6-prefix
	dst-mac
	dst-mac-mask
	dst-port
	ethertype
	every
	ip-dscp
	ip-precedence
	ip-tos
	ip-tos-mask
	ipv6-flow-label
	l3-protocol
	protocol
	src-ip
	src-ip-mask
	src-ipv6
	src-ipv6-prefix
	src-mac
	src-mac-mask
	src-port
	vlan-id
client-qos	mode

Table 15: D-Link Access Point CLI Classes and Properties (Cont.)

Class	*Property*
client-ts	radio
	station-mac
	ts-vi-direction
	ts-vi-medium-time
	ts-vi-rx-bytes
	ts-vi-rx-packets
	ts-vi-tid
	ts-vi-tx-bytes
	ts-vi-tx-packets
	ts-vi-user-priority
	ts-vo-direction
	ts-vo-medium-time
	ts-vo-rx-bytes
	ts-vo-rx-packets
	ts-vo-tid
	ts-vo-tx-bytes
	ts-vo-tx-packets
	ts-vo-user-priority
	vapid
cluster	cluster-name
	clustered
	location

Table 15: D-Link Access Point CLI Classes and Properties (Cont.)

Class	*Property*
detected-ap	band beacon-interval beacons capability channel erp hi-rate last-beacon nmode noise phy-type privacy radio rate security signal ssid supported-rates type wds wired wpa
device-info	device-description device-name product-id version-id
dot11	dot11d debug status
dot1x-supplicant	user

Table 15: D-Link Access Point CLI Classes and Properties (Cont.)

Class	*Property*
email-alert	detail
	from-addr
	log-duration
	log-severity
	mode
	password
	server-password
	server-port
	server-security
	server-username
	smtp-server
	status
	subject
	test-mail
	to-addr-1
	to-addr-2
	to-addr-3
	urgent-severity
firmware-upgrade	upgrade-url
global-radius-server	detail
	radius-accounting
	radius-backupone-ip
	radius-backupone-key
	radius-backupthree-i
	radius-backupthree-key
	radius-backuptwo-ip
	radius-backuptwo-key
	radius-ip
	radius-ip-network
	radius-ipv6
	radius-key
	radius-nas-identifier
host	detail
	dns-1
	dns-2
	dns-via-dhcp
	id
	static-dns-1
	static-dns-2

Table 15: D-Link Access Point CLI Classes and Properties (Cont.)

Class	*Property*
interface	bss
	description
	fd
	hello
	ip
	mac
	mask
	operational-status
	port-isolation
	priority
	radio
	remote-mac
	rx-bytes
	rx-errors
	rx-packets
	security
	ssid
	static-ip
	static-mac
	static-mask
	status
	stp
	tx-bytes
	tx-errors
	tx-packets
	type
	vlan-id
	vlan-interface
	wds-security-policy
	wds-ssid
	wds-wpa-psk-key
	wep-default-key
	wep-key
	wep-key-1
	wep-key-2
	wep-key-3
	wep-key-4
	wep-key-ascii
	wep-key-length
	wep-key-mapping-length
	wpa-personal-key

Table 15: D-Link Access Point CLI Classes and Properties (Cont.)

Class	*Property*
ip-route	destination gateway mask
ipv6-route	destination gateway prefix-length
log	persistence relay-enabled relay-host relay-port remove severity
log-entry	daemon message number priority time
managed-ap	ap-state dhcp-switch-address-1 dhcp-switch-address-2 dhcp-switch-address-3 dhcp-switch-address-4 mode pass-phrase switch-address-1 switch-address-2 switch-address-3 switch-address-4

Table 15: D-Link Access Point CLI Classes and Properties (Cont.)

Class	*Property*
management	autoconfig-ipv6-global-all autoconfig-link-local dhcp-status ip ipv6-autoconfig-status ipv6-status interface mac mask static-mask static-ip static-ipv6 static-ipv6-prefix-length vlan-id
mcs-index	index
mgmt-acl	mgmt-address-1 mgmt-address-2 mgmt-address-3 mgmt-address-4 mgmt-address-5 mode mgmt-ipv6-address-1 mgmt-ipv6-address-2 mgmt-ipv6-address-3 mgmt-ipv6-address-4 mgmt-ipv6-address-5
ntp	server status
policy-attr	class-map-name committed-burst committed-rate drop mark-cos mark-ip-dscp mark-ip-precedence police-simple policy-map-name send
policy-map	attr-count
qos-mac-acl	rule-count

Table 15: D-Link Access Point CLI Classes and Properties (Cont.)

Class	*Property*
qos-mac-rule	acl-name acl-type action cos dst-mac dst-mac-mask ethertype every src-mac src-mac-mask vlan-id
radio	ap-detection beacon-interval channel channel-policy description fixed-multicast-rate fragmentation-threshold mode n-bandwidth n-primary-channel protection rate-limit rate-limit-burst rate-limit-enable rts-threshold scheduler-profile-name short-guard-interval-supported static-channel station-isolation status stbc-mode tx-power wlan-util

Table 15: D-Link Access Point CLI Classes and Properties (Cont.)

Class	*Property*
rule	acl-name acl-type action dst-ipv6 dst-ipv6-prefix every ipv6-flow-label dst-ip dst-ip-mask dst-port ip-dscp ip-precedence ip-tos ip-tos-mask protocol src-ip src-ip-mask src-ipv6 src-ipv6-prefix src-port
scheduler-profile	day start end
scheduler-profile-list	index
serial	baud-rate detail
snmp	detail port ro-community rw-community rw-status source-status source status
snmp-group	read-view secur-level write-view
snmp-target	host port user-name

Table 15: D-Link Access Point CLI Classes and Properties (Cont.)

Class	*Property*
snmp-user	auth-pass auth-type group priv-pass priv-type
snmp-view	oid mask type
snmpv1	status
ssh	status
static-ip-route	destination gateway mask
static-ip6-route	destination gateway prefix-length
supported-rate	mac rate
system telnet	band-plan base-mac base-mac-status country country-code-is-configurable detail dfs-supported forty-mhz-supported-a forty-mhz-supported-g model nmode-supported password platform serial-number system-contact system-location system-name time-zone version status
traphost	community host

Table 15: D-Link Access Point CLI Classes and Properties (Cont.)

Class	*Property*
tspec-acm	ap-inactivity-timeout legacy-wmm-queue-map-mode roam-reserve-limit sta-inactivity-timeout tspec-mode video-acm-limit video-acm-mode voice-acm-limit voice-acm-mode
tspec-ap	ts-vi-num-active ts-vi-num-clients ts-vi-num-roam-clients ts-vo-num-active ts-vo-num-clients ts-vo-num-roam-clients tspec-vi-tot-accepted tspec-vi-tot-rejected tspec-vi-tot-roam-accepted tspec-vi-tot-roam-rejected tspec-vo-tot-accepted tspec-vo-tot-rejected tspec-vo-tot-roam-accepted tspec-vo-tot-roam-rejected
tspec-config	violation-interval
tspec-radio	access-category oper-status num-active num-clients num-roam-clients med-time-admitted med-time-unalloc rx_bytes rx_packets tx_bytes tx_packets

Table 15: D-Link Access Point CLI Classes and Properties (Cont.)

Class	*Property*
tspec-vap	access-category
	oper-status
	med-time-admitted
	med-time-unalloc
	num-active
	num-clients
	num-roam-clients
	radio
untagged-vlan	status
	vlan-id
vap	def-acl-down
	def-acl-up
	def-acltype-down
	def-acltype-up
	def-bwmax-down
	def-bwmax-up
	def-policy-down
	def-policy-up
	description
	global-radius
	qos-mode
	radio
	redirect-mode
	redirect-url
	scheduler-profile-name
	status
	vlan-id
web-server	http-port
	http-status
	http-status
	session-max
	session-timeout
	ssl-cert-generate