Configuring Local CLI - CLISH

This chapter contains the following sections:

- Configuration Guidelines
- Command Reference

Configuration Guidelines

You can configure the Cisco Edge 340 Series in CLISH, which is used for the local CLI configuration. The CLI uses only those commands that are specific to the Cisco Edge 340 Series. Although the syntax is similar to the Cisco IOS CLI, these commands are *incompatible* with Cisco IOS commands.

You can use CLISH in two modes:

- User mode—When you log in to the Cisco Edge 340 Series as an ordinary user, you enter the user mode. To enter the privileged mode, enter the **enable** command and then enter the password of the root user.

- Global (privileged) mode—When you log in to the Cisco Edge 340 Series as root user, you enter the global mode directly and do not have to enter the **enable** command.

Use the CLI to configure these device settings:

- Basic device settings—Hostname, MAC address, bluetooth settings, password, Network Time Protocol (NTP) server, and device language

- Ethernet interface settings—Status, speed, and quality of service (QoS)

- Wireless interface settings—Status, radio, wireless mode, channel, wireless separation, transmission power, Wi-Fi Multimedia (WMM), and advanced wireless settings

- Service Set Identifier (SSID) security settings—Broadcast, authentication, and encryption

Follow these configuration guidelines when using CLISH:

- Enter **ssh** *username@ip-address* or **ssh root@***ip-address* in the command prompt in your PC, and enter the password in the welcome screen. Enter the **mgtcmd** command to start the CLISH process.

- If you log in as an ordinary user, enter the **enable** command and the password of the root user to switch to the global mode.

- Start a Cisco Edge configuration with the **configure terminal** global command. End the Cisco Edge configuration file with the **exit** global command.

Note If you log in to the Cisco Edge 340 Series as ordinary user, and you want to enter CLISH as the root user, use the Linux command **su -**, where - means to switch ordinary user to root user, and use the environment variables of root. If more than 10 minutes passed by without any activity after you enter the privileged mode, you will exit the privileged mode automatically. Notice the prompt > and #; > means user mode, and # means privileged mode.

- From the system configuration mode, you can enter these configuration modes:

  - Ethernet configuration mode

    Use the **interface** system configuration command to enter this mode. Use the **exit** global configuration command to return to the system configuration mode.

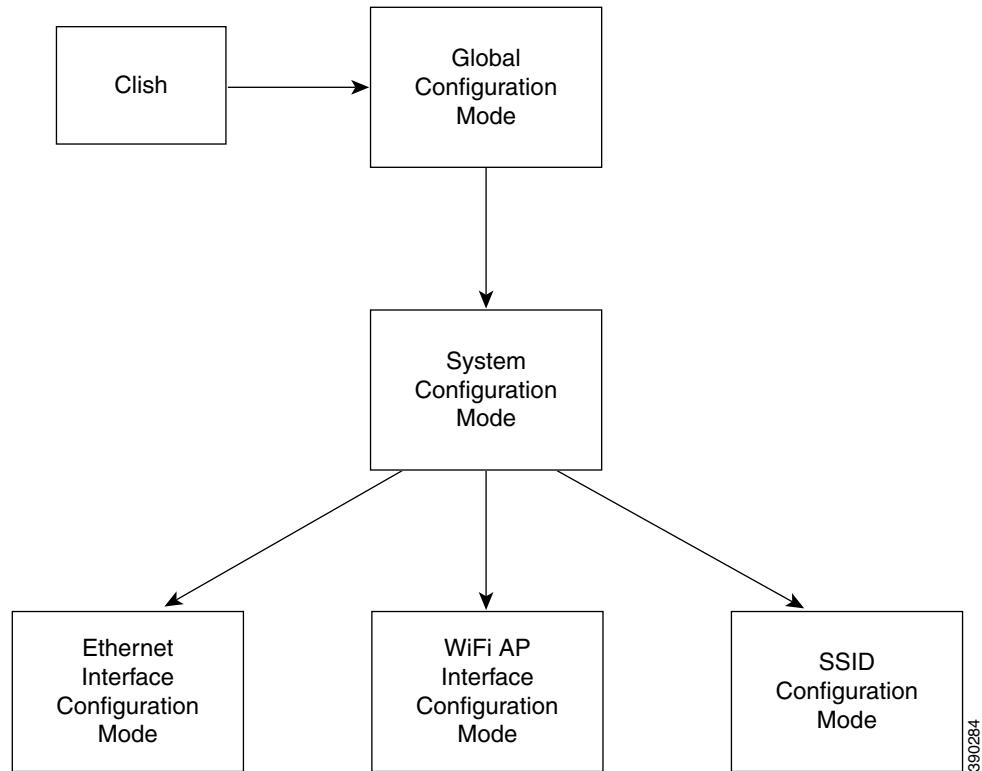 - WiFi AP interface configuration mode

    Use the **interface** system configuration command to enter this mode. We recommend that before you configure any wireless settings, you use the **wireless-mode** WiFi configuration command to set the 802.11 wireless mode. Use the **exit** global configuration command to return to the system configuration mode.

  - SSID configuration mode

    Use the **ssid** system configuration command to enter this mode. Use the **exit** global configuration command to return to the system configuration mode.

- All commands must be entered in lowercase letters. Arguments can include uppercase letters.

- If there is a configuration conflict, the most recent configuration takes precedence. In this example, the SSID is not broadcast:

```
ssid NEWAP1
    broadcast ssid on
    broadcast ssid off
exit
```

Figure 3-1 shows the logic sequence of the CLISH functional structure.

Figure 3-1   ***Logic Sequence of the CLISH Functional Structure***

Command Reference

This sections contains the commands of the following modes:

- User Configuration Mode Commands
- Global Configuration Mode Commands
- System Configuration Mode Commands
- Ethernet Interface Configuration Mode Commands
- WiFi AP Interface Configuration Mode Commands
- SSID Configuration Mode
- show Commands

Note   Syntax description, command default, command mode, usage guidelines, and examples are provided *only* for commands that are not self-explanatory.

User Configuration Mode Commands

This section contains user configuration mode commands. Table 3-1 describes the functions these commands perform.

Table 3-1   User Configuration Mode Commands

Command	Function
enable	Enters the global configuration mode.
exit	Exits from the CLI.
help	Shows the descriptions of the interactive help system.
ping	Diagnoses basic network connectivity, and verifies if the remote device is reachable.
show	Shows running system information.
traceroute	Prints the route packets trace to the network host.

enable

To enter the global configuration mode, use the **enable** command in the user configuration mode.

enable

Command Modes   User configuration

Usage Guidelines   Use the **enable** command and enter the password of the **root** user to switch to the global configuration mode.

exit

To exit the configuration mode that you are in, use the **exit** command in any configuration mode.

exit

Command Modes   User configuration

Global configuration

System configuration

Ethernet interface configuration

WiFi AP interface configuration

SSID configuration

Usage Guidelines   Use **exit** to leave a configuration mode and return to the previous configuration mode.

help

To display a brief description of the help system, use the **help** command in the user configuration mode.

help

Command Modes   User configuration

Global configuration

Usage Guidelines   The **help** command displays a list of available commands, along with a brief description of each. To display additional details for a specific command, enter the command name followed by the -? option.

ping

To diagnose basic network connectivity on a Cisco Edge 340 Series device, use the **ping** command in the user configuration mode or the global configuration mode.

ping {[**ip** | **ipv6** | **arp**] *hostname* | *ip_address*}

Syntax Description

ip	Sends Internet Control Message Protocol (ICMP) IPv4 messages to network hosts (default).
ipv6	Sends ICMP IPv6 messages to network hosts.
arp	Sends ARP requests to neighbor hosts.
hostname	Hostname to ping.
ip_address	IP address to ping.

Command Modes

User configuration

Global configuration

Usage Guidelines

The **ping** command sends an echo request packet to an address then waits for a reply. Ping output can help you evaluate path-to-host reliability, delays over the path, and whether the host can be reached or is functioning.

traceroute

To discover the routes that packets will pass through when traveling to their destination address, use the **traceroute** command in the user configuration mode or the global configuration mode.

> **traceroute** [*protocol*] *destination* [[**resolve**] **source** *ip_address* | **interface** *interface_name*]

Syntax Description	*protocol*	(Optional) Protocol; either IP or IPv6. When not specified, the protocol argument is based on an examination of the destination format by the software. The default protocol is IP.
	destination	The destination address or hostname of the route that you want to trace.
	resolve	Resolves the hostname.
	source *ip_address*	Specifies the source IP address.
	interface *interface_name*	Specifies the source interface.

Command Modes   User configuration

Global configuration

Usage Guidelines   The **traceroute** command works by taking advantage of the error messages generated by devices when a datagram exceeds its hop limit value.

The **traceroute** command first sends probe datagrams with a hop limit of 1. Including a hop limit of 1 with a probe datagram causes the neighboring devices to discard the probe datagram and send back an error message. The **traceroute** command sends several probes with increasing hop limits and displays the round-trip time for each.

The **traceroute** command sends out one probe at a time. Each outgoing packet might result in one or more error messages. A `time-exceeded` error message indicates that an intermediate device has seen and discarded the probe. A `destination unreachable` error message indicates that the destination node has received and discarded the probe because the hop limit of the packet has reached a value of 0. If the timer goes off before a response comes in, the **traceroute** command prints an asterisk (*).

The **traceroute** command is terminated when the destination responds, when the hop limit is exceeded, or when the user interrupts the trace with the escape sequence. By default, to invoke the escape sequence, simultaneously press and release the **Ctrl**, **Shift**, and **6** keys, and then press the **X** key.

Global Configuration Mode Commands

This section contains global configuration mode commands. Table 3-2 describes the functions these commands perform.

Table 3-2   Global Configuration Mode Commands

Command	Function
configure terminal	Starts the Cisco Edge configuration file, and enters the global configuration mode.
copy running-config startup-config	Saves the running configuration as the startup configuration file.
exit	Exits the global configuration mode.
export	Exports the running-config or startup-config to a destination path.
help	Shows the descriptions of the interactive help system.
import	Imports a configuration file to running-config or startup-config.
ping	Diagnoses the basic network connectivity, and verifies if the remote device is reachable.
reboot	Halts and performs a cold restart.
restore	Restores the default factory configuration.
show	Shows running system information.
traceroute	Prints the route packets trace to the network host.

configure terminal

To enter the global configuration mode, use the **configure terminal** in the global configuration mode.

configure terminal

Command Modes   Global configuration

copy running-config startup-config

To save the running configuration as the startup configuration file, use the **copy running-config startup-config** command in the global configuration mode.

copy running-config startup-config

Command Modes   Global configuration

export

To export a configuration file to the USB storage or a local directory, use the **export-config** command in the global configuration mode.

export startup-config to *destination*

Syntax Description	*destination*	Destination that you want to export the configuration file to. The destination can be either a USB or a local directory.

Command Modes   Global configuration

Usage Guidelines   You can export a configuration file to either a USB or a local directory. If you choose to export a configuration file to the USB, the configuration is automatically detected, mounted, and exported to the USB.

import

To import a configuration file from a USB or a local directory, use the **import-config** command in the global configuration mode.

> **import startup-config from** *source*

Syntax Description

source	Location of the configuration file that you want to import. The source can be either a USB or a local directory.

Command Modes   Global configuration

Usage Guidelines   You can import a configuration file from either a USB or a local directory. If you choose to import a configuration file from a USB, the configuration is automatically detected, mounted, and imported from the USB.

reboot

To halt and perform a cold restart, use the **reboot** command in the global configuration mode.

reboot

Command Modes   Global configuration

restore

To restore default factory configuration, use the **restore** command in the global configuration mode.

restore factory-default

Command Modes   Global configuration mode

show

To display running system information, use the **show** command in the global configuration mode.

show

Command Modes   User configuration

Global configuration

System Configuration Mode Commands

This section contains system configuration mode commands. Table 3-3 describes the functions these commands perform.

Table 3-3   System Configuration Mode Commands

Command	Function
auto-login	Enables or disables auto login to the system.
bluetooth	Enables or disables bluetooth on the device.
clock	Configures the time zone.
display	Configures the relation between HDMI and VGA when two monitors are connected.
do	Executes user EXEC or privileged EXEC commands from the global configuration mode or other configuration modes or submodes.
exit	Exits the system configuration mode.
hdmi	Configures HDMI resolution and rotation.
hostname	Configures the hostname of the device.
interface	Enters the Ethernet interface configuration mode to configure the Gigabit Ethernet interface, or enters the WiFi AP interface configuration mode to configure the wireless interface.
language support	Configures the language of the device.
log	Configures the log size.
monitor	Enables or disables HDMI or VGA.
ntp	Configures the NTP server that is used by the device.
proxy-server	Configures the proxy server.
ssh	Configures the SSH users.
ssid	Configures the SSID name and enters the SSID configuration mode to configure the security settings for the access point.
vga	Configures VGA resolution and rotation.
wifi-mode	Sets the WiFi mode.

auto-login

To configure the auto login of the system, use the **auto-login** command in the system configuration mode.

> **auto-login** {**enable** | **disable**}

Syntax Description	enable	Enables auto login to the system.
	disable	Disables auto login to the system.

Command Default   Auto login is disabled.

Command Modes   System configuration

bluetooth

To enable or disable bluetooth on the Cisco Edge 340 Series device, use the **bluetooth** command in the system configuration mode.

bluetooth {**on** | **off**}

Command Default   Bluetooth is on.

Command Modes   System configuration

clock

To set the time zone for display purposes, use the **clock** command in the system configuration mode.

clock timezone *timezone*

Syntax Description	*timezone*	Continent or ocean. Valid values are **Africa**, **America**, **Antarctica**, **Arctic**, **Asia**, **Atlantic**, **Australia**, **Europe**, **Indian**, **Mideast**, and **Pacific**.

Command Modes   System configuration

display

To configure the relation between two monitors, use the **display** command in the system configuration mode.

display type {**hdmi** | **vga**} **relation** *type* {**hdmi** | **vga**}

Syntax Description		
	type	Selects monitor type, either **HDMI** or **VGA**.
	relation *type*	Configures relation between the two monitors. Valid values are **same-as**, **right**, **left**, **below**, and **above**.

Command Modes   System configuration

do

To execute user configuration or global configuration commands in the global configuration mode or other configuration modes, use the **do** command in any configuration mode.

do *command*

Syntax Description

command	User configuration or global configuration command to be executed.

Command Default A user configuration or global configuration command is not executed from a configuration mode.

Command Modes All configuration modes.

Usage Guidelines Use this command to execute user configuration or global configuration commands (such as **show**, **copy**, and **export**) while configuring your routing device. After the command is executed, the system will return to the configuration mode that you were using.

hdmi

To configure high-definition multimedia (HDMI) resolution or rotation, use the **hdmi** command in the system configuration mode.

> **hdmi** {**resolution** *resolution_value* | **rotation** *rotation_value*}

Syntax Description

resolution_value	Resolution that you want to set, in the form *xx@yy*.
rotation_value	Rotation that you want to set. Valid values are **normal**, **right**, **inverted**, and **left**.

Command Modes   System configuration

hostname

To configure the hostname of the Cisco Edge 340 Series device, use the **hostname** command in the system configuration mode.

> **hostname** *name*

Syntax Description

name	Name that you assign to the device.

Command Modes   System configuration

Usage Guidelines   Changing the hostname requires a reboot.

interface

To enter the Ethernet interface configuration mode to configure the Gigabit Ethernet interface, or to enter WiFi AP interface configuration mode to configure the wireless interface, use the **interface** command in the system configuration mode.

interface {**ethernet ge** | **wireless bvi1**}

Syntax Description		
ethernet ge	Configures the Gigabit Ethernet interface.
wireless bvi1	Configures the wireless interface.

Command Modes   System configuration

Usage Guidelines   Use the **interface** command to enter the Ethernet interface configuration mode or the WiFi AP interface configuration mode.

Related Commands   Use the **exit** command to leave the Ethernet interface configuration mode or the WiFi AP interface configuration mode.

Table 3-4 on page 3-37 lists the Ethernet interface configuration mode commands.

Table 3-5 on page 3-44 lists the WiFi AP interface configuration mode commands.

language support

To configure the device language, use the **language support** command in the system configuration mode.

> **language support** *language_value*

Syntax Description

language_value	Language for the device. Valid values are **zh_CH.utf8**, **en_US.utf8**, **ko_KR.utf8**, and **ja_JP.utf8**.

Command Default   The default is English (en_US.utf8).

Command Modes   System configuration

Usage Guidelines   Changing the language requires a reboot.

log

To set the log size, use the **log command** in the system configuration mode.

> **log size** *value*

Syntax Description	**size** *value*	Sets the log size. Default unit is MB. The valid range is from 1 to 10000. Default is 10 MB.

Command Modes   System configuration

monitor

To enable or disable the monitor type of HDMI or VGA, use the **monitor** command in the system configuration mode.

monitor type {**hdmi** | **vga**} {**on** | **off**}

Syntax Description

type	Sets the monitor type.
hdmi	Sets the monitor type to HDMI.
vga	Sets the monitor type to VGA.
on	Enables the monitor.
off	Disables the monitor.

Command Modes   System configuration

■ **no**

no

To remove the configuration for a command or set the command to default, use the **no** command in the system configuration mode.

no

Command Modes   System configuration

ntp

To configure the Network Time Protocol (NTP) server that is used by the Cisco Edge 340 Series device, use the **ntp** command in the system configuration mode.

ntp {**refresh** {**on** | **off**} | **server** *ip_address*}

Syntax Description

refresh	Configures auto sync of the NTP server.
on	Enables auto sync of the NTP server.
off	Disables auto sync of the NTP server.
server *ip_address*	Configures the IP address of the NTP server

Command Modes   System configuration

proxy-server

To configure the proxy server, use the **proxy-server** command in the system configuration mode.

proxy-server *server* [*type*] [**port** *port_number*]

Syntax Description

server	Hostname or IP address of the proxy server.
type	(optional) Type of proxy server. Valid values are **no_for**, **all**, **http**, **ftp**, and **https**.
port *port_number*	(optional) Specifies the proxy port number. The range is from 0 to 65535.

Command Modes   System configuration

ssh

To configure a Secure Shell (SSH) user, use the **ssh** command in the system configuration mode.

ssh {**add** *user* | **delete** *user*}

Syntax Description		
	add *user*	Adds an SSH user.
	delete *user*	Deletes an SSH user.

Command Modes   System configuration

ssid

To set the Service Set Identifier (SSID) name and enter the SSID configuration mode to configure the security settings for the access point of the device, use the **ssid** command in the system configuration mode.

ssid *ssid*

Syntax Description	*ssid*	SSID name for the access point. The name can include all the ASCII characters except ' \ " ? = , and space.

Command Default   The default SSID name is CISCO_EDGE.

Command Modes   System configuration

Related Commands   Use the **exit** command to leave the SSID configuration mode.

Table 3-6 on page 3-75 lists the SSID configuration mode commands.

vga

To configure the Video Graphics Array (VGA) resolution or rotation, use the **vga** command in the system configuration mode.

      vga {**resolution** *resolution* | **rotation** *rotation*}

Syntax Description

resolution	Resolution that you want to set, in the form *xx@yy*.
rotation	Rotation that you want to set. Valid values are **normal**, **right**, **inverted**, and **left**.

Command Modes   System configuration

wifi-mode

To set the WiFi mode of the Cisco Edge 340 Series device, use the **wifi-mode** command in the global configuration mode.

wifi-mode {WiFiAP | WiFiSta | NonWiFi}

Syntax Description

WiFiAP	Sets the WiFi mode to access point (AP) after reboot.
WiFiSta	Sets the WiFi mode to client after reboot.
NonWiFi	Sets the WiFi mode to off.

Command Modes   System configuration

Usage Guidelines   If you choose the AP mode, the Cisco Edge 340 Series device will work in the AP mode immediately, and only the commands that are specific to the AP mode are visible. If you choose the client mode, the Cisco Edge 340 series device will work in the client mode immediately, and only the commands that are specific to the client mode are visible.

Ethernet Interface Configuration Mode Commands

This section contains Ethernet interface configuration mode commands. Table 3-4 describes the functions these commands perform.

Table 3-4   Ethernet Interface Configuration Mode Commands

Command	Function
do	Executes user configuration or global configuration commands from the global configuration mode or other configuration modes.
duplex	Configures the duplex mode for the Gigabit Ethernet (GE) interface.
exit	Exits the Ethernet interface configuration mode.
ip address	Configures the IP address of an interface.
ip default-gateway	Configures the default gateway.
ipv6 address	Configures the IPv6 address of an interface.
ipv6 default-gateway	Configures the IPv6 default gateway.
speed	Configures the speed for the GE interface.

duplex

To configure the duplex mode for the Gigabit Ethernet (GE) interface, use the **duplex** command in the Ethernet interface configuration mode.

duplex {auto | half | full}

Syntax Description		
	auto	Configures automatic duplex mode sensing.
	half	Configures half-duplex mode.
	full	Configures full-duplex mode.

Defaults   The default is automatic duplex mode sensing.

ip address

To set the IP address for an interface, use the **ip address** command in the Ethernet interface configuration mode.

ip address {*dhcp* | *ip_address*}

Syntax Description

dhcp	IP address negotiated through the Dynamic Host Configuration Protocol (DHCP).
ip_address	IP address of the interface.

Command Default   The default is dhcp.

ipv6 address

To set the IPv6 address for an interface, use the **ipv6 address** command in the Ethernet interface configuration mode.

> **ipv6 address** {*dhcp* | *ipv6_address*}

Syntax Description

dhcp	IPv6 address negotiated through DHCP.
ipv6_address	IPv6 address of the interface.

Command Default   The default is dhcp.

ip default-gateway

To specify the default gateway for the Cisco Edge 340 Series device, use the **ip default-gateway** command in the Ethernet interface configuration mode.

ip default-gateway *ip_address*

Syntax Description

ip_address	IP address of the default gateway.

ipv6 default-gateway

To specify the IPv6 default gateway for the Cisco Edge 340 Series device, use the **ipv6 default-gateway** command in the Ethernet interface configuration mode.

ipv6 default-gateway *ipv6_address*

Syntax Description

ip_address	IPv6 address of the default gateway.

speed

To configure the speed for an interface, use the **speed** command in the Ethernet configuration mode.

speed {**auto** | **10** | **100** | **1000**}

Syntax Description

auto	Configures automatic speed sensing.
10	Configures 10 Mbps speed.
100	Configures 100 Mbps speed.
1000	Configures 1000 Mbps speed and full-duplex mode.

Command Default   The default is auto.

speed

WiFi AP Interface Configuration Mode Commands

This section contains WiFi AP interface configuration mode commands. Table 3-5 describes the functions these commands perform.

Table 3-5   WiFi AP Interface Configuration Mode Commands

Command	Function
aggregation-msdu	Enables or disables aggregation MAC Service Data Unit (MSDU).
ap-isolation	Configures wireless separation for clients that are connected to the same SSID.
apsd	Configures Wi-Fi Multimedia (WMM) power save mode for an access point.
auto-block	Enables or disables auto block.
ba-decline	Enables or disables to decline a ba request.
beacon-interval	Configures the beacon interval for an access point.
bg-protection	Configures the CTS-to-self protection for an access point.
channel bandwidth	Configures the channel width when the access point functions in the 802.11n mode or the 802.11n mixed mode.
channel number	Configures the channel number (which sets the frequency) for an access point.
data-beacon-rate	Configures the Delivery Traffic Indication Message (DTIM) interval for an access point.
do	Executes user configuration or global configuration commands from the global configuration mode or other configuration modes.
exit	Exits the WiFi AP interface configuration mode.
extension channel	Configures the control-side band that is used for the extension or secondary channel when the access point functions in the 802.11n mode or the 802.11n mixed mode.
frag-threshold	Configures the frag threshold.
guard-interval	Configures the period between packets when an access point functions in the 802.11n mode or the 802.11n mixed mode.
igmp-snoop	Enables or disables Internet Group Management Protocol (IGMP) snooping.
mcs	Configures the high throughput Modulation and Coding Schemes (MCS) rate when the access point functions in 802.11n mode or 802.11n mixed mode.
multicast-mcs	Configures the high throughput MCS rate on multicast frames.
multicast-phy-mode	Configures PHY mode on multicast frames.
operating-mode	Configures greenfield or mixed mode when the access point functions in the 802.11n mode.
packet aggregation	Configures Aggregate MAC Service Data Unit (A-MSDU) packet aggregation when an access point functions in the 802.11n mode or the 802.11n mixed mode.

Table 3-5   WiFi AP Interface Configuration Mode Commands (continued)

Command	Function
rdg	Configures the Reverse Direction Grant (RDG) when an access point functions in the 802.11n mode or the 802.11n mixed mode.
rts-threshold	Sets the RTS threshold.
short-slot	Configures the short-slot time when the access point functions in the 802.11g mode or the 802.11g mixed mode.
stbc	Configures the space time block coding (STBC).
transmit burst	Configures the transmit burst (Tx burst) for an access point.
transmit preamble	Configures the preamble for an access point.
transmit power	Configures the power at which an access point radio transmits its wireless signal.
wireless-mode	Configures the 802.11 wireless mode for an access point.
wmm	Configures Wi-Fi Multimedia (WMM) for an access point.

aggregation-msdu

To enable or disable MAC Service Data Unit (MSDU) aggregation, use the **aggregation-msdu** command in the WiFi AP interface configuration mode.

aggregation-msdu {on | off}

Syntax Description	on	Enables aggregation MSDU.
	off	Disables aggregation MSDU.

Command Modes   WiFi AP interface configuration

ap-isolation

To configure wireless separation for clients that are connected to the same Service Set Identifier (SSID), use the **ap-isolation** command in the WiFi AP interface configuration mode.

ap-isolation {**on** | **off**}

Syntax Description	on	Enables wireless separation. Wireless clients that are connected to the same SSID are prevented from communicating with each other.
	off	Disables wireless separation. Wireless clients that are connected to the same SSID can communicate with each other.

Command Default   Wireless separation is disabled.

Related Commands   WiFi AP interface configuration

■   apsd

apsd

To configure Wi-Fi Multimedia (WMM) power save mode for an access point, use the **apsd** command in the WiFi AP interface configuration mode.

apsd {**on** | **off**}

Syntax Description

on	Enables WMM power save mode.
off	Disables WMM power save mode.

Command Default   WMM power save mode is disabled.

Command Modes   WiFi AP interface configuration

Usage Guidelines   You can configure the **apsd** command only when the WMM is enabled.

Related Commands   Use the **wmm** command to enable WMM.

auto-block

To configure auto block, use the **auto-block** command in the WiFi AP interface configuration mode.

auto-block {on | off}

Syntax Description	**on**	Enables auto block.
	off	Disables auto block.

Related Commands   WiFi AP interface configuration

ba-decline

To enable or disable the task of declining a BA request, use the **ba-decline** command in the WiFi AP interface configuration mode.

ba-decline {**on** | **off**}

Syntax Description

on	Enables the task of declining a BA request.
off	Disables the task of declining a BA request.

Command Modes   WiFi AP interface configuration

beacon-interval

To configure the beacon interval for an access point, use the **beacon-interval** command in the WiFi AP interface configuration mode.

beacon-interval *interval*

Syntax Description	*interval*	Period that you want to configure the beacon interval with. The range is between 20 and 1000 milliseconds. The default is 100 milliseconds.

Command Default   The default period is 100 milliseconds.

Command Modes   WiFi AP interface configuration

Usage Guidelines   The default setting should work well for most networks.

Configure a long interval to:

- Increase an access point's throughput performance.
- Decrease the discovery time for clients and decrease the roaming efficiency.
- Decrease the power consumption of clients.

Configure a short interval to:

- Minimize the discovery time for clients and improve the roaming efficiency
- Decrease an access point's throughput performance.
- Increase the power consumption of clients.

bg-protection

To configure CTS-to-self protection for an access point, use the **bg-protection** command in the WiFi AP interface configuration mode.

bg-protection {**auto** | **on** | **off**}

Note   This command applies to the 802.11b/g mixed mode, 802.11n/g mixed mode, and 802.11b/g/n mixed mode.

Syntax Description

auto	Configures automatic selection of CTS-to-self protection.
on	Enables CTS-to-self protection.
off	Disables CTS-to-self protection.

Command Default   The default is automatic selection of CTS-to-self protection.

Command Modes   WiFi AP interface configuration

Usage Guidelines   CTS-to-self protection minimizes collisions among clients in a mixed mode environment, but reduces throughput performance.

channel bandwidth

To configure the channel width in a scenario there an access point functions in the 802.11n mode, use the **channel bandwidth** command in the WiFi AP interface configuration mode.

channel bandwidth {**20** | **20/40**}

Note   This command applies to the 802.11n mode or the 802.11n mixed mode.

Syntax Description

20	Configures a 20-MHz channel width.
20/40	Configures automatic selection of a 20-MHz or a 40-MHz channel width.

Command Default   The default is automatic selection of a 20-MHz or a 40-MHz channel width.

Command Modes   WiFi AP interface configuration

Usage Guidelines   The default setting should work well for most networks.

A 40-MHz channel provides a higher throughput performance for 802.11n clients.

802.11b and 802.11g clients can function only with a 20-MHz channel.

Related Commands   The setting of the **channel bandwidth** command affects the options for the **mcs** command.

channel number

To configure a channel number, which sets the frequency for an access point, use the **channel number** command in the WiFi AP interface configuration mode.

channel number {**auto** | *number*}

Syntax Description	

auto	Configures automatic selection of a channel number.
number	Channel number. The default is auto.

Command Default   The default value is auto.

Command Modes   WiFi AP interface configuration

Usage Guidelines   We recommend that you either use the default channel number or the automatic selection of the channel number and only change the channel number if you experience interference in the network.

data-beacon-rate

To configure the Delivery Traffic Indication Message (DTIM) interval for an access point, use the **data-beacon-rate** command in the WiFi AP interface configuration.

> **data-beacon-rate** *rate*

Syntax Description	*rate*	The range is between 1 and 255 milliseconds. The default is 1 millisecond.

Command Default   The default rate is 1 millisecond.

Command Modes   WiFi AP interface configuration

Usage Guidelines   The DTIM interval is a multiple of the beacon interval. Before you change the DTIM interval, consider the types of clients in the network: laptops might function better with a short interval, but mobile phones might function better with a long interval.

A long interval allows clients to save power, but may delay multicast and broadcast traffic.

A short interval decreases the delivery time of multicast and broadcast traffic, but may increase power consumption by clients.

Related Commands   The setting of the **beacon-interval** command affects the **data-beacon-rate** command.

extension channel

To configure the control sideband that is used for the extension or secondary channel when an access point functions in the 802.11n mode, use the **extension channel** command in the WiFi AP interface configuration mode.

> extension channel {**upper** | **lower**}

✎

Note   This command applies to the 802.11n mode or the 802.11n mixed mode.

Syntax Description		
	upper	Configures the upper extension channel.
	lower	Configures the lower extension channel.

Command Default   The lower extension channel is configured.

Command Modes   WiFi AP interface configuration

Usage Guidelines   This command takes effect only when you configure a 40-MHz channel width.

When the main channel number is in the lower range (for example, in the 1 to 4 range), use the upper extension channel.

When the main channel number is in the upper range (for example, in the 10 to 13 range), use the lower extension channel.

When the main channel number is in the middle range (for example, in the 5 to 9 range), use either the upper extension channel or the lower extension channel.

Related Commands   Use the **channel bandwidth** command to configure the channel width.

Use the **channel number** command to configure the main channel number.

frag-threshold

To configure the Frag threshold, use the **frag-threshold** command in the WiFi AP interface configuration mode.

> **frag-threshold** *value*

Syntax Description

value	Configures the Frag threshold value. The range is from 256 to 2346.

Command Modes   WiFi AP interface configuration

guard-interval

To configure the guard interval period between packets when the access point functions in the 802.11n mode, use the **guard-interval** command in the WiFi AP interface configuration mode.

guard-interval {**400** | **800**}

Note   This command applies to the 802.11n mode or the 802.11n mixed mode.

Syntax Description

400	Configures a short guard interval of 400 nanoseconds (ns).
800	Configures a long guard interval of 800 ns.

Command Default   The default is 400 ns.

Command Modes   WiFi AP interface configuration

Usage Guidelines   Use a 400-ns interval to increase the throughput performance for 802.11n clients, but may result in some packet errors and multipath interference.

Use an 800-ns interval to minimize packet errors and multipath interference, but decrease the throughput performance for 802.11n clients.

Related Commands   The setting of the **guard-interval** command affects the options for the **mcs** command.

igmp-snoop

To enable or disable Internet Group Management Protocol (IGMP) snooping on a wireless interface, use the **igmp-snoop** command in the WiFi AP interface configuration mode.

igmp-snoop {**on** | **off**}

Syntax Description	**on**	IGMP snooping is on.
	off	IGMP snooping is off.

Command Default IGMP snooping is off.

Command Modes WiFi AP interface configuration

■   mcs

mcs

To configure the high throughput Modulation and Coding Scheme (MCS) rate when an access point functions in the 802.11n mode, use the **mcs** command in the WiFi AP interface configuration mode.

> **mcs** *index_number*

✎

Note   This command applies to the 802.11n mode or the 802.11n mixed mode.

Syntax Description

index_number	The range is from 0 to 15, and 33 (automatic selection).

Command Default   The default is 33 (automatic rate configuration).

Command Modes   WiFi AP interface configuration

Usage Guidelines   This table shows the MCS index numbers with their potential data rates in Mbps based on MCS, guard interval, and channel width.

Index Number	Guard Interval of 800 nanoseconds		Guard Interval of 400 nanoseconds	
	20-MHz Channel Width	40-MHz Channel Width	20-MHz Channel Width	40-MHz Channel Width
0	6.5	13.5	7 2/9	15
1	13	27	14 4/9	30
2	19.5	40.5	21 2/3	45
3	26	54	28 8/9	60
4	39	81	43 1/3	90
5	52	109	57 5/9	120
6	58.5	121.5	65	135
11	52	108	57 7/9	120
12	78	162	86 2/3	180
13	104	216	115 5/9	240
14	117	243	130	270
15	130	270	144 4/9	300
33	Configures automatic selection of the MCS index number.			

We recommend that you use automatic selection of the MCS index number. Change the MCS index to a fixed number only if the Received Signal Strength Indication (RSSI) for the clients in the network can support the selected MCS index number.

Related Commands   The setting of the **channel bandwidth** command affects the options for the **mcs** command.

The setting of the **guard-interval** command affects the options for the **mcs** command.

multicast-mcs

To configure the high throughput Modulation and Coding Scheme (MCS) rate on multicast frames when an access point functions in the 802.11n mode, use the **multicast-mcs** command in the WiFi AP interface configuration mode.

multicast-mcs *index_number*

✎

Note   This command applies to the 802.11n mode or the 802.11n mixed mode.

Syntax Description

index_number	The range is from 0 to 15.

Command Default   The default is 2.

Usage Guidelines   This table shows the MCS index numbers with their potential data rates in Mbps based on MCS, guard interval, and channel width.

Index Number	Guard Interval of 800 ns		Guard Interval of 400 ns	
	20-MHz Channel Width	40-MHz Channel Width	20-MHz Channel Width	40-MHz Channel Width
0	6.5	13.5	7 2/9	15
1	13	27	14 4/9	30
2	19.5	40.5	21 2/3	45
3	26	54	28 8/9	60
4	39	81	43 1/3	90
5	52	109	57 5/9	120
6	58.5	121.5	65	135
7	65	135	72 2/9	152.5
8	13	27	14 4/9	30
9	26	54	28 8/9	60
10	39	81	43 1/3	90
11	52	108	57 7/9	120
12	78	162	86 2/3	180
13	104	216	115 5/9	240
14	117	243	130	270
15	130	270	144 4/9	300

multicast-phy-mode

To configure the PHY mode on multicast frames when an access point functions in the 802.11n mode, use the **multicast-phy-mode** command in the WiFi AP interface configuration mode.

multicast-phy-mode {**0** | **1** | **2** | **3**}

Syntax Description		
	0	Specifies that the mode is disabled.
	1	Specifies Complementary Code Keying (CCK) (802.11b).
	2	Specifies Orthogonal Frequency Division Multiplexing (OFDM) (802.11g). This is the default.
	3	Specifies HTMIX (802.11b/g/n).

Command Default   The default is 2.

Command Modes   WiFi AP interface configuration

operating-mode

To configure greenfield mode or the mixed mode when an access point functions in the 802.11n mode, use the **operating-mode** command in the WiFi AP interface configuration mode.

operating-mode {**greenfield** | **mixed**}

Note   This command applies to the 802.11n mode.

Syntax Description

greenfield	Configures the greenfield mode, which improves 802.11n throughput performance, but prevents 802.11b and 802.11g clients present in the coverage area from recognizing the 802.11n traffic.
mixed	Configures the mixed mode, which allows the 802.11b and 802.11g clients in the coverage area to recognize the 802.11n traffic. This is the default.

Command Default   The default is **mixed**.

Command Modes   WiFi AP interface configuration

Usage Guidelines   Use the greenfield mode if there are only 802.11n clients in the coverage area. If you use the greenfield mode when 802.11b, 802.11g, and 802.11n clients coexist in the same coverage area, packet collisions might occur.

Use the mixed mode when 802.11b, 802.11g, and 802.11n clients coexist in the same coverage area.

packet aggregation

To configure Aggregate MAC Service Data Unit (A-MSDU) packet aggregation when an access point functions in the 802.11n mode, use the **packet aggregation** command in the WiFi AP interface configuration mode.

> **packet aggregation** {**on** | **off**}

✎
Note   This command applies to the 802.11n mode or the 802.11n mixed mode.

Syntax Description	
on	Enables packet aggregation.
off	Disables packet aggregation.

Command Default   Packet aggregation is off.

Command Modes   WiFi AP interface configuration

Usage Guidelines   Enable packet aggregation if network traffic consists primarily of data.

Disable packet aggregation if network traffic consists primarily of voice, video, or other multimedia traffic.

rdg

To configure the Reverse Direction Grant (RDG) when an access point functions in the 802.11n mode, use the **rdg** command in the WiFi AP interface configuration mode.

rdg {**on** | **off**}

Note   This command applies to the 802.11n mode or the 802.11n mixed mode.

Syntax Description

on	Enables RDG.
off	Disables RDG.

Command Default   RDG is disabled.

Command Modes   WiFi AP interface configuration

Usage Guidelines   When RDG is enabled, a transmitter that has reserved the channel transmission opportunity allows the receiver to send packets in the reserved direction. When RDG is disabled, packets can be transmitted only in one direction during the channel transmission opportunity reservation.

Enable RDG for better throughput performance of 802.11n traffic.

rts-threshold

To configure the Request to Send (RTS) threshold, use the **rts-threshold** command in the WiFi AP interface configuration mode.

rts-threshold *value*

Syntax Description	*value*	Sets the RTS threshold. The range is from 1 to 2347.

Command Modes   WiFi AP interface configuration

short-slot

To configure the short-slot time when the access point functions in the 802.11g mode or the 802.11g mixed mode, use the **short-slot** command in the WiFi AP interface configuration mode.

short-slot {**on** | **off**}

✎

Note This command applies to the 802.11g mode or the 802.11g mixed mode.

Syntax Description

on	Enables short-slot time.
off	Disables short-slot time.

Command Default Short-slot time is enabled.

Command Modes WiFi AP interface configuration

Usage Guidelines Enable the short-slot time for better throughput performance for 802.11g clients.

If there are mostly 802.11b clients in the network, disable the short-slot time.

stbc

To configure the space time block coding (STBC), use the **stbc** command in the WiFi AP interface configuration mode.

stbc {**on** | **off**}

Syntax Description

on	Enables STBC.
off	Disables STBC.

Related Commands   WiFi AP interface configuration

transmit burst

To configure the transmit burst (Tx burst) for an access point, use the **transmit burst** command in the WiFi AP interface configuration mode.

transmit burst {**on** | **off**}

Syntax Description	on	Enables Tx burst.
	off	Disables Tx burst.

Command Default   Tx burst is enabled.

Command Modes   WiFi AP interface configuration

Usage Guidelines   Leave Tx burst on for better throughput performance.

Disable Tx burst if you notice wireless interference in the network.

transmit preamble

To configure the preamble for an access point, use the **transmit preamble** command in the WiFi AP interface configuration mode.

>   **transmit preamble** {**long** | **short** | **auto**}

Syntax Description

long	Configures a long preamble.
short	Configures a short preamble.
auto	Configures automatic preamble selection.

Command Default   The default is a long preamble.

Command Modes   WiFi AP interface configuration

Usage Guidelines   Use the long preamble setting for compatibility with legacy 802.11 systems operating at 1 and 2 Mb/s.

Configure a short preamble setting to improve throughput performance.

transmit power

To configure the power at which an access point radio transmits its wireless signal, use the **transmit power** command in the WiFi AP interface configuration mode.

transmit power *percentage*

Syntax Description		
percentage	Percentage of transmit power. The range is from 1 to 100.	

Command Default   The default is 100 percent.

Command Modes   WiFi AP interface configuration

Usage Guidelines   For transmission of the wireless signal over a long distance, use the 100 percent setting.

For transmission of the wireless signal over a short distance, for example, when all the clients are in a small room, lower the percentage.

wireless-mode

To configure the 802.11 wireless mode for an access point, use the **wireless-mode** command in the WiFi AP interface configuration mode.

wireless-mode {**0** | **1** | **2** | **4** | **6** | **7** | **8** | **9** | **11**|}

Syntax Description	**0**	Configures the 802.11b/g mixed mode.
	1	Configures the 802.11b mode.
	2	Configures the 802.11a mode for 5GHz only.
	4	Configures the 802.11g mode.
	6	Configures the 802.11n mode for 2GHz only.
	7	Configures the 802.11n/g mixed mode.
	8	Configures the 802.11a/n mixed mode for 5GHz only.
	9	Configures the 802.11b/g/n mixed mode.
	11	Configures the 802.11n mode for 5GHz only.

Command Default   The default is the 802.11b/g/n mixed mode.

Command Modes   WiFi AP interface configuration

Usage Guidelines   802.11b/g mixed mode—Select this mode if you have devices in the network that support 802.11b and 802.11g.

802.11b mode—Select this mode if all the devices in the wireless network only support 802.11b.

802.11a mode for 5GHz only—Select this mode if all the devices in the wireless network only support 802.11a in the 5GHz band.

802.11g mode—Select this mode if all the devices in the wireless network only support 802.11g.

802.11n mode for 2GHz only—Select this mode if all the devices in the wireless network only support 802.11n in the 2GHz band.

802.11b/g/n mixed mode—Select this mode if you have devices in the network that support 802.11b, 802.11g, and 802.11n.

802.11b/g mixed mode—Select this mode if you have devices in the network that support 802.11b and 802.11g.

wmm

To configure Wi-Fi Multimedia (WMM) for an access point, use the **wmm** command in the WiFi AP interface configuration mode.

wmm {**on** | **off**}

Syntax Description	on	Enables WMM.
	off	Disables WMM.

Command Default   WMM is disabled.

Command Modes   WiFi AP interface configuration

Usage Guidelines   WMM provides QoS for wireless traffic. If there is a lot of mixed media traffic (voice, video, data), enable WMM.

Related Commands   Use the **apsd** command to configure WMM power save mode.

SSID Configuration Mode

This section contains Service Set Identifier (SSID) configuration mode commands. Table 3-6 describes the functions these commands perform.

Table 3-6   SSID Configuration Commands

Command	Function
broadcast ssid	Enables or disables broadcast of the Service Set Identifier (SSID) name.
do	Executes THE user EXEC or privileged EXEC commands from global configuration mode or other configuration modes or submodes.
encryption mode (open, shared, or WEP configuration)	Configures open, shared, Wi-Fi Protected Access (WPA), WPA1WPA2, WPA2, WPA2PSK, WPAPSK, and WPAPSKWPA2PSK authentication and associated encryption for the access point.
encryption mode (WPA configuration)	
exit	Exits the SSID configuration mode.
no	Removes the configuration for a command or sets the command to default.
radius-server	Configures the name of a RADIUS server.

Note   Configuration for SSID will take effect after exiting the SSID configuring mode.

broadcast ssid

To enable or disable broadcast of the SSID name, use the **broadcast ssid** command in the SSID configuration mode.

     broadcast ssid {**on** | **off**}

Syntax Description	on	Enables broadcast of the SSID name.
	off	Disables broadcast of the SSID name.

Command Default   The SSID is broadcast.

Command Modes   SSID configuration

Usage Guidelines   Disable broadcast of the SSID for enhanced security. Only wireless clients who know the SSID can connect to the access point.

Enable broadcast of the SSID for wider availability and easier access.

encryption mode (open, shared, or WEP configuration)

To configure open, shared, or Wired Equivalency Privacy (WEP) authentication and associated encryption for an access point, use the **encryption mode** command in the SSID configuration mode.

encryption mode {**open** | **shared**} **type** {**none** | **wep** {**key** {**1** | **2** | **3** | **4**} {**hex** *number* | **ascii** *phrase*}}}

Syntax Description

open	Configures open access without authentication.
shared	Configures authentication with a shared key.
none	Configures no encryption.
wep	Configures WEP encryption.
key 1 key 2 key 3 key 4	Configures the key number for WEP encryption. (You can use only one of the four keys.)
hex *number*	Configures either authentication with a hexadecimal key or authentication and encryption with a hexadecimal key: • When you select the **none** keyword, configures authentication with a hexadecimal key. • When you select the **wep** keyword, configures authentication and encryption with a hexadecimal key. For *number*, enter either 10 or 26 hexadecimal digits.
ascii *phrase*	Configures either authentication with a passphrase or authentication and encryption with a passphrase: • When you select the **none** keyword, configures authentication with a passphrase. • When you select the **wep** keyword, configures authentication and encryption with a passphrase. For *phrase*, enter either 5 or 13 alphanumerical characters. Dash (-) and underscore (_) characters are supported.

Command Default   The default is open access and no encryption.

Command Modes   SSID configuration

Usage Guidelines   For shared access without encryption, the WEP hexadecimal number or passphrase is used only for authentication.

For shared access with WEP encryption, the WEP hexadecimal number or passphrase is used for both authentication and encryption.

■ **encryption mode (open, shared, or WEP configuration)**

Examples   This example shows how to configure shared authentication and WEP encryption, using key 3 and the passphrase 3uifsfis-_0r5:

```
encryption mode shared type wep key 3 ascii 3uifsfis-_0r5
```

encryption mode (WPA configuration)

To configure Wi-Fi Protected Access (WPA) authentication and associated encryption for an access point, use the **encryption mode** command in the SSID configuration mode.

> **encryption mode** {**wpapsk** | **wpa2psk** | **wpapskwpa2psk**} **type** {**tkip** | **aes** | **tkipaes**}
> **pass-phrase** *phrase*

Syntax Description

wpapsk	Configures WPA with preshared key (PSK) authentication.
wpa2psk	Configures WPA2 with PSK authentication.
wpapskwpa2psk	Configures combined WPA and WPA2 with PSK authentication.
tkip	Configures Temporal Key Integrity Protocol (TKIP) encryption.
aes	Configures Advanced Encryption Standard (AES) encryption.
tkipaes	Configures combined TKIP and AES encryption.
pass-phrase *phrase*	Configures a passphrase (password). For *phrase*, enter at least 8 and a maximum of 63 alphanumerical characters. Dash (-) and underscore(_) characters are supported.

Command Default   The default is open access and no encryption.

Command Modes   SSID configuration

Examples   This example shows how to configure combined WPA and WPA2 authentication with combined TKIP and AES encryption, using the passphrase safE478_Ty33Yep-:

```
encryption mode wpapskwpa2psk type tkipaes pass-phrase safE478_Ty33Yep-
```

encryption mode (802.1x)

To configure Wi-Fi Protected Access (WPA) authentication and associated encryption for an access point, use the **encryption mode** command in the SSID configuration mode.

encryption mode {**wpa** | **wpa2** | **wpa1wpa2**} **type** {**tkip** | **aes** | **tkipaes**}

✎

Note   The encryption mode (802.1x) should be used in combination with RADIUS server.

Syntax Description		
wpa	Configures WPA with 802.1x authentication.	
wpa2	Configures WPA2 with 802.1x authentication.	
wpa1wpa2	Configures combined WPA and WPA2 with 802.1x authentication.	
tkip	Configures Temporal Key Integrity Protocol (TKIP) encryption.	
aes	Configures Advanced Encryption Standard (AES) encryption.	
tkipaes	Configures combined TKIP and AES encryption.	

Command Default   The default mode is wpa2psk access, tkipaes encryption, and the password is Cisco123.

Command Modes   SSID configuration

Examples   This example shows how to configure combined WPA and WPA2 authentication with combined TKIP and AES encryption, using the 802.1x authentication method:

```
encryption mode wpa1wpa2 type tkipaes
```

radius-server

To configure the related information of a RADIUS server, use the **radius-server** in the SSID configuration mode.

>   **radius-server** *hostname* [**auth-port** *port_number*] [**key** *secret*]

Syntax Description

hostname	Hostname or IP address of the RADIUS server.
auth-port	Specifies the authentication port number of the RADIUS server.
port_number	Authentication port number of the RADIUS server. The range is from 0 to 65535. The default is 1812.
key	Specifies the password of the authentication service on the RADIUS server.
secret	Password of the authentication service on the RADIUS server.

Command Default

The default value for *port_number* is 1812.

The default value for *secret* is NULL.

Command Modes

SSID configuration

Examples

This example shows how to configure the related information of a RADIUS server:

```
radius-server 192.168.1.1 auth-port 1812 key pass1234
```

show Commands

User Configuration Mode

Use the following **show** commands in the user configuration mode to display the configuration on a Cisco Edge 340 Series device:

- **show cpu**—Displays CPU information.
- **show mac**—Displays MAC address.
- **show memory**—Displays memory usage information.
- **show mount**—Displays mount information.
- **show os-build-time**—Displays release build time.
- **show os-version**—Displays release version.
- **show os-install-time**—Displays release installed time.
- **show storage**—Displays storage information.

Global Configuration Mode

Use the following **show** commands in the global configuration mode to display the configuration on a Cisco Edge 340 Series device:

- **show all-running-config**—Displays all information about the running configuration.
- **show all-startup-config**—Displays all information about the startup configuration.
- **show running-config**—Displays the configuration saved in the RAM.
- **show startup-config**—Displays the configuration saved in the database.
- **show bluetooth**—Displays bluetooth information.
- **show hdmi dev-name**—Displays the device name of the connected HDMI monitor.
- **show hdmi current-resolution**—Displays the current resolution of the connected HDMI monitor.
- **show hdmi support-resolution**—Displays the connected HDMI monitor support resolution.
- **show hostname**—Displays the hostname.
- **show ip interface**—Displays the status of interfaces configured for IP.
- **show log-size**—Displays the log size.
- **show monitor-full**—Displays all the current monitor information.
- **show ssid**—Displays the AP wireless ssid setting.
- **show wifi-mode**—Displays the WiFi mode.
- **show vga dev-name**—Displays the device name of the connected VGA monitor.
- **show vga current-resolution**—Displays the current resolution of the connected VGA monitor.
- **show vga support-resolution**—Displays the connected VGA monitor support resolution.