Cisco Catalyst 9800 Series Wireless Controller Command Reference, Cisco IOS XE Cupertino 17.9.x

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Preface

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Document Conventions

This document uses the following conventions:

Convention	Description
^ or Ctrl	Both the **^** symbol and Ctrl represent the Control (Ctrl) key on a keyboard. For example, the key combination **^D** or **Ctrl-D** means that you hold down the Control key while you press the D key. (Keys are indicated in capital letters but are not case sensitive.)
bold font	Commands and keywords and user-entered text appear in **bold** font.
Italic font	Document titles, new or emphasized terms, and arguments for which you supply values are in *italic* font.
`Courier` font	Terminal sessions and information the system displays appear in `courier` font.
`Bold Courier` font	**`Bold Courier`** font indicates text that the user must enter.
[x]	Elements in square brackets are optional.
...	An ellipsis (three consecutive nonbolded periods without spaces) after a syntax element indicates that the element can be repeated.
|	A vertical line, called a pipe, indicates a choice within a set of keywords or arguments.
[x | y]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
{x | y}	Required alternative keywords are grouped in braces and separated by vertical bars.

Convention	Description
[x {y | z}]	Nested set of square brackets or braces indicate optional or required choices within optional or required elements. Braces and a vertical bar within square brackets indicate a required choice within an optional element.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
< >	Nonprinting characters such as passwords are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Reader Alert Conventions

This document may use the following conventions for reader alerts:

Note   Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.

Tip   Means *the following information will help you solve a problem.*

Caution   Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

Timesaver   Means *the described action saves time.* You can save time by performing the action described in the paragraph.

Warning   IMPORTANT SAFETY INSTRUCTIONS

Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Read the installation instructions before using, installing, or connecting the system to the power source. Use the statement number provided at the end of each warning statement to locate its translation in the translated safety warnings for this device. Statement 1071

SAVE THESE INSTRUCTIONS

Related Documentation

Note Before installing or upgrading the device, refer to the release notes at https://www.cisco.com/c/en/us/support/wireless/catalyst-9800-series-wireless-controllers/products-release-notes-list.html.

- Cisco Catalyst 9800-40 Wireless Controller documentation, located at:

  http://www.cisco.com/go/c9800

- Cisco Catalyst 9800-80 Wireless Controller documentation, located at:

  http://www.cisco.com/go/c9800

- Cisco Catalyst 9800-L Wireless Controller documentation, located at:

  http://www.cisco.com/go/c9800

Communications, Services, and Additional Information

- To receive timely, relevant information from Cisco, sign up at Cisco Profile Manager.

- To get the business impact you're looking for with the technologies that matter, visit Cisco Services.

- To submit a service request, visit Cisco Support.

- To discover and browse secure, validated enterprise-class apps, products, solutions, and services, visit Cisco DevNet.

- To obtain general networking, training, and certification titles, visit Cisco Press.

- To find warranty information for a specific product or product family, access Cisco Warranty Finder.

Cisco Bug Search Tool

Cisco Bug Search Tool (BST) is a gateway to the Cisco bug-tracking system, which maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. The BST provides you with detailed defect information about your products and software.

Documentation Feedback

To provide feedback about Cisco technical documentation, use the feedback form available in the right pane of every online document.

Using the Command-Line Interface

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Information About Using the Command-Line Interface

Note   Search options on the GUI and CLI are case sensitive.

Command Modes

The Cisco IOS user interface is divided into many different modes. The commands available to you depend on which mode you are currently in. Enter a question mark (?) at the system prompt to obtain a list of commands available for each command mode.

You can start a CLI session through a console connection, through Telnet, an SSH, or by using the browser.

When you start a session, you begin in user mode, often called user EXEC mode. Only a limited subset of the commands are available in user EXEC mode. For example, most of the user EXEC commands are one-time commands, such as **show** commands, which show the current configuration status, and **clear** commands, which clear counters or interfaces. The user EXEC commands are not saved when the device reboots.

To have access to all commands, you must enter privileged EXEC mode. Normally, you must enter a password to enter privileged EXEC mode. From this mode, you can enter any privileged EXEC command or enter global configuration mode.

Using the configuration modes (global, interface, and line), you can make changes to the running configuration. If you save the configuration, these commands are stored and used when the device reboots. To access the various configuration modes, you must start at global configuration mode. From global configuration mode, you can enter interface configuration mode and line configuration mode .

This table describes the main command modes, how to access each one, the prompt you see in that mode, and how to exit the mode.

Table 1: Command Mode Summary

Mode	Access Method	Prompt	Exit Method	About This Mode
User EXEC	Begin a session using Telnet, SSH, or console.	`Device>`	Enter **logout** or **quit**.	Use this mode to • Change terminal settings. • Perform basic tests. • Display system information.

Mode	Access Method	Prompt	Exit Method	About This Mode
Privileged EXEC	While in user EXEC mode, enter the **enable** command.	`Device#`	Enter **disable** to exit.	Use this mode to verify commands that you have entered. Use a password to protect access to this mode.
Global configuration	While in privileged EXEC mode, enter the **configure** command.	`Device(config)#`	To exit to privileged EXEC mode, enter **exit** or **end**, or press **Ctrl-Z**.	Use this mode to configure parameters that apply to the entire device.
VLAN configuration	While in global configuration mode, enter the **vlan** *vlan-id* command.	`Device(config-vlan)#`	To exit to global configuration mode, enter the **exit** command. To return to privileged EXEC mode, press **Ctrl-Z** or enter **end**.	Use this mode to configure VLAN parameters. When VTP mode is transparent, you can create extended-range VLANs (VLAN IDs greater than 1005) and save configurations in the device startup configuration file.
Interface configuration	While in global configuration mode, enter the **interface** command (with a specific interface).	`Device(config-if)#`	To exit to global configuration mode, enter **exit**. To return to privileged EXEC mode, press **Ctrl-Z** or enter **end**.	Use this mode to configure parameters for the Ethernet ports.
Line configuration	While in global configuration mode, specify a line with the **line vty** or **line console** command.	`Device(config-line)#`	To exit to global configuration mode, enter **exit**. To return to privileged EXEC mode, press **Ctrl-Z** or enter **end**.	Use this mode to configure parameters for the terminal line.

Understanding Abbreviated Commands

You need to enter only enough characters for the device to recognize the command as unique.

This example shows how to enter the **show configuration** privileged EXEC command in an abbreviated form:

```
Device# show conf
```

No and Default Forms of Commands

Almost every configuration command also has a **no** form. In general, use the **no** form to disable a feature or function or reverse the action of a command. For example, the **no shutdown** interface configuration command reverses the shutdown of an interface. Use the command without the keyword **no** to reenable a disabled feature or to enable a feature that is disabled by default.

Configuration commands can also have a **default** form. The **default** form of a command returns the command setting to its default. Most commands are disabled by default, so the **default** form is the same as the **no** form. However, some commands are enabled by default and have variables set to certain default values. In these cases, the **default** command enables the command and sets variables to their default values.

CLI Error Messages

This table lists some error messages that you might encounter while using the CLI to configure your device.

Table 2: Common CLI Error Messages

Error Message	Meaning	How to Get Help
`% Ambiguous command: "show con"`	You did not enter enough characters for your device to recognize the command.	Reenter the command followed by a question mark (?) without any space between the command and the question mark. The possible keywords that you can enter with the command appear.
`% Incomplete command.`	You did not enter all of the keywords or values required by this command.	Reenter the command followed by a question mark (?) with a space between the command and the question mark. The possible keywords that you can enter with the command appear.
`% Invalid input detected at '^' marker.`	You entered the command incorrectly. The caret (^) marks the point of the error.	Enter a question mark (?) to display all of the commands that are available in this command mode. The possible keywords that you can enter with the command appear.

Configuration Logging

You can log and view changes to the device configuration. You can use the Configuration Change Logging and Notification feature to track changes on a per-session and per-user basis. The logger tracks each configuration command that is applied, the user who entered the command, the time that the command was entered, and the parser return code for the command. This feature includes a mechanism for asynchronous notification to registered applications whenever the configuration changes. You can choose to have the notifications sent to the syslog.

Note Only CLI or HTTP changes are logged.

Using the Help System

You can enter a question mark (?) at the system prompt to display a list of commands available for each command mode. You can also obtain a list of associated keywords and arguments for any command.

SUMMARY STEPS

1. **help**
2. *abbreviated-command-entry* **?**
3. *abbreviated-command-entry* <Tab>
4. **?**
5. *command* **?**
6. *command keyword* **?**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**help** **Example:** Device# **help**	Obtains a brief description of the help system in any command mode.
Step 2	*abbreviated-command-entry* **?** **Example:** Device# **di?** dir disable disconnect	Obtains a list of commands that begin with a particular character string.
Step 3	*abbreviated-command-entry* <Tab> **Example:** Device# **sh conf**<tab> Device# **show configuration**	Completes a partial command name.
Step 4	**?** **Example:**	Lists all commands available for a particular command mode.

	Command or Action	Purpose
	`Device> ?`	
Step 5	*command* **?** **Example:** `Device> show ?`	Lists the associated keywords for a command.

Step 6	*command keyword* **?**
	
	Example:
	
	`Device(config)# wireless management ?`
	`certificate  Configure certificate details`
	`interface    Select an interface to configure`
	`transfer     Active transfer profiles`
	`trustpoint   Select a trustpoint to configure`
		Lists the associated arguments for a keyword.

Configuration Commands: a to f

3gpp-info

To configure a 802.11u 3rd Generation Partnership Project (3GPP) cellular network used by hotspots, use the **3gpp-info** command. To remove the network, use the **no** form of the command.

3gpp-info *country-code network-code*

Syntax Description	*country-code*	Mobile country code.
	network-code	Mobile network code.

Command Default None

Command Modes Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure a 802.11u 3GPP cellular network:

```
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# 3gpp-info us mcc
```

aaa accounting identity

To enable authentication, authorization, and accounting (AAA) for IEEE 802.1x, MAC authentication bypass (MAB), and web authentication sessions, use the **aaa accounting identity** command in global configuration mode. To disable IEEE 802.1x accounting, use the **no** form of this command.

aaa accounting identity {*name* | **default** } **start-stop** {**broadcast group** {*name* | **radius** | **tacacs+**} [**group** {*name* | **radius** | **tacacs+**} . . .] | **group** {*name* | **radius** | **tacacs+**} [**group** {*name* | **radius** | **tacacs+**} . . .] }
no aaa accounting identity {*name* | **default** }

Syntax Description		
name	Name of a server group. This is optional when you enter it after the **broadcast group** and **group** keywords.
default	Uses the accounting methods that follow as the default list for accounting services.
start-stop	Sends a start accounting notice at the beginning of a process and a stop accounting notice at the end of a process. The start accounting record is sent in the background. The requested-user process begins regardless of whether or not the start accounting notice was received by the accounting server.
broadcast	Enables accounting records to be sent to multiple AAA servers and send accounting records to the first server in each group. If the first server is unavailable, the device uses the list of backup servers to identify the first server.
group	Specifies the server group to be used for accounting services. These are valid server group names: • *name* — Name of a server group. • **radius** — Lists of all RADIUS hosts. • **tacacs+** — Lists of all TACACS+ hosts. The **group** keyword is optional when you enter it after the **broadcast group** and **group** keywords. You can enter more than optional **group** keyword.
radius	(Optional) Enables RADIUS authorization.
tacacs+	(Optional) Enables TACACS+ accounting.

Command Default AAA accounting is disabled.

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines To enable AAA accounting identity, you need to enable policy mode. To enable policy mode, enter the **authentication display new-style** command in privileged EXEC mode.

This example shows how to configure IEEE 802.1x accounting identity:

```
Device# authentication display new-style

Please note that while you can revert to legacy style
configuration at any time unless you have explicitly
entered new-style configuration, the following caveats
should be carefully read and understood.

(1) If you save the config in this mode, it will be written
    to NVRAM in NEW-style config, and if you subsequently
    reload the router without reverting to legacy config and
    saving that, you will no longer be able to revert.

(2) In this and legacy mode, Webauth is not IPv6-capable. It
    will only become IPv6-capable once you have entered new-
    style config manually, or have reloaded with config saved
    in 'authentication display new' mode.

Device# configure terminal
Device(config)# aaa accounting identity default start-stop group radius
```

aaa accounting update periodic interval-in-minutes

To configure accounting update records intervals, use the **aaa accounting update periodic** command.

aaa accounting update periodic *interval-in-minutes* [**jitter maximum** *jitter-max-value*]

Syntax Description	**periodic**	Send accounting update records at regular intervals.
	<1-71582>	Periodic intervals to send accounting update records(in minutes)
	jitter	Set jitter parameters for periodic interval
	maximum	Set maximum jitter value for periodic interval (in seconds)
	<0-2147483>	Maximum jitter value for periodic interval(in seconds). Default is 300 seconds.

Command Default	None

Command Modes	Global configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the interval to five minutes at which the accounting records are updated:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# aaa accounting update periodic 5
```

aaa authentication dot1x

To specify the authentication, authorization, and accounting (AAA) method to use on ports complying with the IEEE 802.1x authentication, use the **aaa authentication dot1x** command in global configuration mode . To disable authentication, use the **no** form of this command.

aaa authentication dot1x {**default**} *method1*
no aaa authentication dot1x {**default**} *method1*

Syntax Description		
default	The default method when a user logs in. Use the listed authentication method that follows this argument.	
method1	Specifies the server authentication. Enter the **group radius** keywords to use the list of all RADIUS servers for authentication.	
	Note	Though other keywords are visible in the command-line help strings, only the **default** and **group radius** keywords are supported.

Command Default No authentication is performed.

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines The **method** argument identifies the method that the authentication algorithm tries in the specified sequence to validate the password provided by the client. The only method that is IEEE 802.1x-compliant is the **group radius** method, in which the client data is validated against a RADIUS authentication server.

If you specify **group radius**, you must configure the RADIUS server by entering the **radius-server host** global configuration command.

Use the **show running-config** privileged EXEC command to display the configured lists of authentication methods.

This example shows how to enable AAA and how to create an IEEE 802.1x-compliant authentication list. This authentication first tries to contact a RADIUS server. If this action returns an error, the user is not allowed access to the network.

```
Device(config)# aaa new-model
Device(config)# aaa authentication dot1x default group radius
```

aaa authentication login

To set authentication, authorization, and accounting (AAA) at login, use the **aaa authentication login** command in global configuration mode.

aaa authentication login *authentication-list-name* { **group** } *group-name*

Syntax Description		
	authentication-list-name	Character string used to name the list of authentication methods activated when a user logs in.
	group	Uses a subset of RADIUS servers for authentication as defined by the server group **group-name**.
	group-name	Server group name.

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples

The following example shows how to set an authentication method list named **local_webauth** to the group type named **local** in local web authentication:

```
Device(config)# aaa authentication login local_webauth local
```

The following example shows how to set an authentication method to RADIUS server group in local web authentication:

```
Device(config)# aaa authentication login webauth_radius group ISE_group
```

aaa authorization

To set the parameters that restrict user access to a network, use the **aaa authorization** command in global configuration mode. To remove the parameters, use the **no** form of this command.

aaa authorization { **auth-proxy** | **cache** | **commands** *level* | **config-commands** | **configuration** | **console** | **credential-download** | **exec** | **multicast** | **network** | **onep** | **policy-if** | **prepaid** | **radius-proxy** | **reverse-access** | **subscriber-service** | **template**} {**default** | *list_name* } [*method1* [*method2* . . .]]

Syntax Description

auth-proxy	Runs authorization for authentication proxy services.
cache	Configures the authentication, authorization, and accounting (AAA) server.
commands	Runs authorization for all commands at the specified privilege level.
level	Specific command level that should be authorized. Valid entries are 0 through 15.
config-commands	Runs authorization to determine whether commands entered in configuration mode are authorized.
configuration	Downloads the configuration from the AAA server.
console	Enables the console authorization for the AAA server.
credential-download	Downloads EAP credential from Local/RADIUS/LDAP.
exec	Enables the console authorization for the AAA server.
multicast	Downloads the multicast configuration from the AAA server.
network	Runs authorization for all network-related service requests, including Serial Line Internet Protocol (SLIP), PPP, PPP Network Control Programs (NCPs), and AppleTalk Remote Access (ARA).
onep	Runs authorization for the ONEP service.
reverse-access	Runs authorization for reverse access connections, such as reverse Telnet.
template	Enables template authorization for the AAA server.
default	Uses the listed authorization methods that follow this keyword as the default list of methods for authorization.
list_name	Character string used to name the list of authorization methods.
method1 [*method2*...]	(Optional) An authorization method or multiple authorization methods to be used for authorization. A method may be any one of the keywords listed in the table below.

Command Default   Authorization is disabled for all actions (equivalent to the method keyword **none**).

Command Modes	Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   Use the **aaa authorization** command to enable authorization and to create named methods lists, which define authorization methods that can be used when a user accesses the specified function. Method lists for authorization define the ways in which authorization will be performed and the sequence in which these methods will be performed. A method list is a named list that describes the authorization methods (such as RADIUS or TACACS+) that must be used in sequence. Method lists enable you to designate one or more security protocols to be used for authorization, which ensures a backup system in case the initial method fails. Cisco IOS software uses the first method listed to authorize users for specific network services; if that method fails to respond, the Cisco IOS software selects the next method listed in the method list. This process continues until there is successful communication with a listed authorization method, or until all the defined methods are exhausted.

✎
Note   The Cisco IOS software attempts authorization with the next listed method only when there is no response from the previous method. If authorization fails at any point in this cycle--meaning that the security server or the local username database responds by denying the user services--the authorization process stops and no other authorization methods are attempted.

If the **aaa authorization** command for a particular authorization type is issued without a specified named method list, the default method list is automatically applied to all interfaces or lines (where this authorization type applies) except those that have a named method list explicitly defined. (A defined method list overrides the default method list.) If no default method list is defined, then no authorization takes place. The default authorization method list must be used to perform outbound authorization, such as authorizing the download of IP pools from the RADIUS server.

Use the **aaa authorization** command to create a list by entering the values for the *list-name* and the *method* arguments, where *list-name* is any character string used to name this list (excluding all method names) and *method* identifies the list of authorization methods tried in the given sequence.

✎
Note   In the table that follows, the **group***group-name*, **group ldap**, **group radius**, and **group tacacs**+ methods refer to a set of previously defined RADIUS or TACACS+ servers. Use the **radius server** and **tacacs server** commands to configure the host servers. Use the **aaa group server radius**, **aaa group server ldap**, and **aaa group server tacacs**+ commands to create a named group of servers.

This table describes the method keywords.

Table 3: aaa authorization Methods

Keyword	Description
cache *group-name*	Uses a cache server group for authorization.

Keyword	Description
group *group-name*	Uses a subset of RADIUS or TACACS+ servers for accounting as defined by the **server group** *group-name* command.
group ldap	Uses the list of all Lightweight Directory Access Protocol (LDAP) servers for authentication.
group radius	Uses the list of all RADIUS servers for authentication as defined by the **aaa group server radius** command.
grouptacacs+	Uses the list of all TACACS+ servers for authentication as defined by the **aaa group server tacacs+** command.
if-authenticated	Allows the user to access the requested function if the user is authenticated. **Note** The **if-authenticated** method is a terminating method. Therefore, if it is listed as a method, any methods listed after it will never be evaluated.
local	Uses the local database for authorization.
none	Indicates that no authorization is performed.

Cisco IOS software supports the following methods for authorization:

- Cache Server Groups—The router consults its cache server groups to authorize specific rights for users.

- If-Authenticated—The user is allowed to access the requested function provided the user has been authenticated successfully.

- Local—The router or access server consults its local database, as defined by the **username** command, to authorize specific rights for users. Only a limited set of functions can be controlled through the local database.

- None—The network access server does not request authorization information; authorization is not performed over this line or interface.

- RADIUS—The network access server requests authorization information from the RADIUS security server group. RADIUS authorization defines specific rights for users by associating attributes, which are stored in a database on the RADIUS server, with the appropriate user.

- TACACS+—The network access server exchanges authorization information with the TACACS+ security daemon. TACACS+ authorization defines specific rights for users by associating attribute-value (AV) pairs, which are stored in a database on the TACACS+ security server, with the appropriate user.

Method lists are specific to the type of authorization being requested. AAA supports five different types of authorization:

- Commands—Applies to the EXEC mode commands a user issues. Command authorization attempts authorization for all EXEC mode commands, including global configuration commands, associated with a specific privilege level.

- EXEC—Applies to the attributes associated with a user EXEC terminal session.

- Network—Applies to network connections. The network connections can include a PPP, SLIP, or ARA connection.

> **Note** You must configure the **aaa authorization config-commands** command to authorize global configuration commands, including EXEC commands prepended by the **do** command.

- Reverse Access—Applies to reverse Telnet sessions.

- Configuration—Applies to the configuration downloaded from the AAA server.

When you create a named method list, you are defining a particular list of authorization methods for the indicated authorization type.

Once defined, the method lists must be applied to specific lines or interfaces before any of the defined methods are performed.

The authorization command causes a request packet containing a series of AV pairs to be sent to the RADIUS or TACACS daemon as part of the authorization process. The daemon can do one of the following:

- Accept the request as is.

- Make changes to the request.

- Refuse the request and authorization.

For a list of supported RADIUS attributes, see the module RADIUS Attributes. For a list of supported TACACS+ AV pairs, see the module TACACS+ Attribute-Value Pairs.

> **Note** Five commands are associated with privilege level 0: **disable**, **enable**, **exit**, **help**, and **logout**. If you configure AAA authorization for a privilege level greater than 0, these five commands will not be included in the privilege level command set.

The following example shows how to define the network authorization method list named mygroup, which specifies that RADIUS authorization will be used on serial lines using PPP. If the RADIUS server fails to respond, local network authorization will be performed.

```
Device(config)#  aaa authorization network mygroup group radius local
```

aaa authorization credential download default

To set an authorization method list to use local credentials, use the **aaa authorization credential download default** command in global configuration mode.

aaa authorization credential download default *group-name*

Syntax Description

group-name	Server group name.

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

The following example shows how to set an authorization method list to use local credentials:

```
Device(config)# aaa authorization credential-download default local
```

aaa group server ldap

To configure a AAA server group, use the **aaa group server ldap** command.

aaa group server ldap *group-name*

Command Default	None
Command Modes	Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.1	This command was introduced.

This example shows how to configure a AAA server group:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# aaa new-model
Device(config)# aaa group server ldap name1
Device(config-ldap-sg)# server server1
Device(config-ldap-sg)# exit
```

aaa group server radius

To group different RADIUS server hosts into distinct lists and distinct methods, use the **aaa group server radius** command in global configuration mode.

aaa group server radius *group-name*

Syntax Description

group-name	Character string used to name the group of servers.

Command Default   None

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The authentication, authorization, and accounting (AAA) server-group feature introduces a way to group existing server hosts. The feature enables you to select a subset of the configured server hosts and use them for a particular service.

A group server is a list of server hosts of a particular type. Currently supported server host types are RADIUS server hosts. A group server is used in conjunction with a global server host list. The group server lists the IP addresses of the selected server hosts.

The following example shows how to configure an AAA group server named **ISE_Group** that comprises three member servers:

```
Device(config)# aaa group server radius ISE_Group
```

aaa local authentication default authorization

To configure local authentication method list, use the **aaa local authentication default authorization** command.

aaa local authentication default authorization [*method-list-name* | **default**]

Syntax Description

method-list-name	Name of the method list.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure local authentication method list to the default list:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# aaa local authentication default authorization default
```

aaa new-model

To enable the authentication, authorization, and accounting (AAA) access control model, issue the **aaa new-model** command in global configuration mode. To disable the AAA access control model, use the **no** form of this command.

aaa new-model
no aaa new-model

Syntax Description   This command has no arguments or keywords.

Command Default   AAA is not enabled.

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   This command enables the AAA access control system.

If the **login local** command is configured for a virtual terminal line (VTY), and the **aaa new-model** command is removed, you must reload the device to get the default configuration or the **login** command. If the device is not reloaded, the device defaults to the **login local** command under the VTY.

✎

Note   We do not recommend removing the **aaa new-model** command.

The following example shows this restriction:

```
Device(config)# aaa new-model
Device(config)# line vty 0 15
Device(config-line)# login local
Device(config-line)# exit
Device(config)# no aaa new-model
Device(config)# exit
Device# show running-config | b line vty

line vty 0 4
 login local  !<=== Login local instead of "login"
line vty 5 15
 login local
!
```

Examples   The following example initializes AAA:

```
Device(config)# aaa new-model
Device(config)#
```

Related Commands	Command	Description
	aaa accounting	Enables AAA accounting of requested services for billing or security purposes.
	aaa authentication arap	Enables an AAA authentication method for ARAP using TACACS+.
	aaa authentication enable default	Enables AAA authentication to determine if a user can access the privileged command level.
	aaa authentication login	Sets AAA authentication at login.
	aaa authentication ppp	Specifies one or more AAA authentication method for use on serial interfaces running PPP.
	aaa authorization	Sets parameters that restrict user access to a network.

aaa server radius dynamic-author

To configure a device as an authentication, authorization, and accounting (AAA) server to facilitate interaction with an external policy server, use the **aaa server radius dynamic-author**command in global configuration mode. To remove this configuration, use the **no** form of this command.

aaa server radius dynamic-author
no aaa server radius dynamic-author

Syntax Description   This command has no arguments or keywords.

Command Default   The device will not function as a server when interacting with external policy servers.

Command Modes   Global configuration

Command History

Release	Modification
12.2(28)SB	This command was introduced.
12.4	This command was integrated into Cisco IOS Release 12.4.
Cisco IOS XE Release 2.6	This command was integrated into Cisco IOS XE Release 2.6.
12.2(5)SXI	This command was integrated into Cisco IOS Release 12.2(5)SXI.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T.
	This command was introduced.

Usage Guidelines   Dynamic authorization allows an external policy server to dynamically send updates to a device. Once the **aaa server radius dynamic-author** command is configured, dynamic authorization local server configuration mode is entered. Once in this mode, the RADIUS application commands can be configured.

Dynamic Authorization for the Intelligent Services Gateway (ISG)

ISG works with external devices, referred to as policy servers, that store per-subscriber and per-service information. ISG supports two models of interaction between the ISG device and external policy servers: initial authorization and dynamic authorization.

The dynamic authorization model allows an external policy server to dynamically send policies to the ISG. These operations can be initiated in-band by subscribers (through service selection) or through the actions of an administrator, or applications can change policies on the basis of an algorithm (for example, change session quality of service (QoS) at a certain time of day). This model is facilitated by the Change of Authorization (CoA) RADIUS extension. CoA introduced peer-to-peer capability to RADIUS, enabling ISG and the external policy server each to act as a RADIUS client and server.

Examples   The following example configures the ISG to act as a AAA server when interacting with the client at IP address 10.12.12.12:

```
aaa server radius dynamic-author
```

```
client 10.12.12.12 key cisco
message-authenticator ignore
```

Related Commands

Command	Description
auth-type (ISG)	Specifies the server authorization type.
client	Specifies a RADIUS client from which a device will accept CoA and disconnect requests.
default	Sets a RADIUS application command to its default.
domain	Specifies username domain options.
ignore	Overrides a behavior to ignore certain paremeters.
port	Specifies a port on which local RADIUS server listens.
server-key	Specifies the encryption key shared with RADIUS clients.

aaa session-id

To specify whether the same session ID will be used for each authentication, authorization, and accounting (AAA) accounting service type within a call or whether a different session ID will be assigned to each accounting service type, use the **aaa session-id** command in global configuration mode. To restore the default behavior after the **unique** keyword is enabled, use the **no** form of this command.

aaa session-id [**common** | **unique**]
no aaa session-id [**unique**]

Syntax Description	common	(Optional) Ensures that all session identification (ID) information that is sent out for a given call will be made identical. The default behavior is **common**.
	unique	(Optional) Ensures that only the corresponding service access-requests and accounting-requests will maintain a common session ID. Accounting-requests for each service will have a different session ID.

Command Default The **common**keyword is enabled.

Command Modes

Global configuration

Command History	Release	Modification
	12.2(4)B	This command was introduced.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA
	12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
		This command was integrated in Cisco IOS XE 16.12.1.

Usage Guidelines The **common**keywordbehaviorallows the first session ID request of the call to be stored in a common database; all proceeding session ID requests will retrieve the value of the first session ID. Because a common session ID is the default behavior, this functionality is written to the system configuration after the **aaa new-model**command is configured.

Note The router configuration will always have either the **aaa session-id common** or the **aaa session-id unique** command enabled; it is not possible to have neither of the two enabled. Thus, the **no aaa session-id unique** command will revert to the default functionality, but the **no aaa session-id common** command will not have any effect because it is the default functionality.

The **unique** keyword behavior assigns a different session ID for each accounting type (Auth-Proxy, Exec, Network, Command, System, Connection, and Resource) during a call. To specify this behavior, the unique

keyword must be specified. The session ID may be included in RADIUS access requests by configuring the **radius-server attribute 44 include-in-access-req**command. The session ID in the access-request will be the same as the session ID in the accounting request for the same service; all other services will provide unique session IDs for the same call.

Examples

The following example shows how to configure unique session IDs:

```
aaa new-model
aaa authentication ppp default group radius
radius-server host 10.100.1.34
radius-server attribute 44 include-in-access-req
aaa session-id unique
```

Related Commands

Command	Description
aaa new model	Enables AAA.
radius-server attribute 44 include-in-access-req	Sends RADIUS attribute 44 (Accounting Session ID) in access request packets before user authentication (including requests for preauthentication).

access-session wireless cui-enable

To enable Chargeable User Identity (CUI) attribute in the authentication and accounting messages sent to a AAA server, use the **access-session wireless cui-enable** command. To disable the CUI attribute in the authentication and accounting messages sent to a AAA server, use the **no** form of this command.

access-session wireless cui-enable

no access-session wireless cui-enable

Syntax Description	This command has no keywords or arguments.
Command Default	CUI is not enabled.
Command Modes	Global Configuration (config)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Usage Guidelines Setting CUI attribute is applicable only for 802.1x clients.

Examples The following example shows how to enable the CUI attribute in the authentication and accounting messages sent to a AAA server:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# access-session wireless cui-enable
```

aaa-override

To enable AAA override, use the **aaa-override** command. To disable AAA override, use the **no** form of this command.

aaa-override

no aaa-override

Syntax Description	This command has no keywords or arguments.
Command Default	AAA is disabled by default.
Command Modes	Wireless policy configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to enable AAA:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy policy-test
Device(config-wireless-policy)# aaa-override
```

aaa-override vlan fallback

To allow fallback to policy profile VLAN when the overridden VLAN is not available, use the **aaa-override vlan fallback** command, in the wireless policy configuration mode. To disable fallback to policy profile VLAN, use the **no** form of this command.

aaa-override vlan fallback

no aaa-override vlan fallback

Syntax Description   This command has no arguments or keywords.

Command Default   None

Command Modes   Wireless policy configuration mode

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to allow fallback to policy profile VLAN when the overridden VLAN is not available:

```
Device# configure terminal
Device(config)# wireless profile policy defalt-policy-profile
Device(config-wireless-policy)# aaa-override vlan fallback
```

aaa-policy

To map a AAA policy in a WLAN policy profile, use the **aaa-policy** command.

aaa-policy *aaa-policy-name*

Syntax Description	*aaa-policy-name*	Name of the AAA policy.

Command Default   None

Command Modes   config-wireless-policy

Command History

Release	**Modification**
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to map a AAA policy in a WLAN policy profile:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy policy-name
Device(config-wireless-policy)# aaa-policy aaa-policy-name
```

aaa-realm enable

To enable AAA RADUIS selection by realm, use the **aaa-realm enable** command.

aaa-realm enable

Command Default | None

Command Modes | config-aaa-policy

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to enable AAA RADIUS section by realm:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless aaa policy aaa-profile-name
Device (config-aaa-policy)#  aaa-realm enable
```

absolute-timer

To enable an absolute timeout for subscriber sessions, use the **absolute-timer** command in service template configuration mode. To disable the timer, use the **no** form of this command.

absolute-timer *minutes*
no absolute-timer

Syntax Description	*minutes* — Maximum session duration, in minutes. Range: 1 to 65535. Default: 0, which disables the timer.

Command Default   Disabled (the absolute timeout is 0).

Command Modes   Service template configuration (config-service-template)

Command History

Release	Modification
Cisco IOS XE Release 3.2SE	This command was introduced.

Usage Guidelines   Use the **absolute-timer** command to limit the number of minutes that a subscriber session can remain active. After this timer expires, a session must repeat the process of establishing its connection as if it were a new request.

Examples   The following example shows how to set the absolute timeout to 15 minutes in the service template named SVC_3:

```
service-template SVC_3
 description sample
 access-group ACL_2
 vlan 113
 inactivity-timer 15
 absolute-timer 15
```

Related Commands

Command	Description
event absolute-timeout	Specifies the type of event that triggers actions in a control policy if conditions are met.
inactivity-timer	Enables an inactivity timeout for subscriber sessions.
show service-template	Displays configuration information for service templates.

access-list

To add an access list entry, use the **access-list** command.

access-list {*1-99 100-199 1300-1999 2000-2699*} [*sequence-number*] {**deny** | **permit**} {*hostname-or-ip-addr* [*wildcard-bits* | **log**] | **any** [**log**] | **host** *hostname-or-ip-addr* **log**} | {**remark** [*line*]}

Syntax Description		
1-99	Configures IP standard access list.
100-199	Configures IP extended access list.
1300-1999	Configures IP standard access list (expanded range).
2000-2699	Configures IP extended access list (expanded range).
sequence-number	Sequence number of the ACL entry. Valid range is 1 to 2147483647.
deny	Configures packets to be rejected.
permit	Configures packets to be forwarded.
hostname-or-ip-addr	Hostname or the IP address to match.
wildcard-bits	Wildcard bits to match the IP address.
log	Configures log matches against this entry.
any	Any source host.
host	A single host address.
remark	Configures ACL entry comment.
line	The ACL entry comment.

Command Default None

Command Modes Global Config

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to add an access list entry:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# access-list 1 permit any
```

access-list acl-ace-limit

To set the maximum configurable ace limit for all ACLs, use the **access-list acl-ace-limit** command.

access-list acl-ace-limit *max-ace-limit*

Syntax Description	*max-ace-limit* Maximum number of ace limit for all ACLs. Valid range is 1 to 4294967295.

Command Default	None

Command Modes	Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to set the maximum configurable ace limit for all ACLs to 100:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# access-list acl-ace-limit 100
```

accounting-list

To configure RADIUS accounting servers on a WLAN policy profile, use the **accounting-list** command. To disable RADIUS server accounting, use the **no** form of this command.

accounting-list *radius-server-acct*
no accounting-list

Syntax Description	*radius-server-acct* Accounting RADIUS server name.

Command Default   RADIUS server accounting is disabled by default.

Command Modes   WLAN policy configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   You must disable the WLAN before using this command. See Related Commands section for more information on how to disable a WLAN.

This example shows how to configure RADIUS server accounting on a WLAN policy profile:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy rr-xyz-policy-1
Device(config-wireless-policy)# accounting-list test
Device(config-wireless-policy)# no shutdown
```

This example shows how to disable RADIUS server accounting on a WLAN policy profile:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy rr-xyz-policy-1
Device(config-wireless-policy)# no accounting-list test
Device(config-wireless-policy)# no shutdown
```

acl-policy

To configure an access control list (ACL) policy, use the **acl-policy** command.

acl-policy *acl-policy-name*

Syntax Description	*acl-policy-name* Name of the ACL policy.

Command Default   None

Command Modes   config-wireless-flex-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure an ACL policy name:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile flex default-flex-profile
Device(config-wireless-flex-profile)# acl-policy my-acl-policy
```

action power-saving-mode power-profile

To map a specific power profile to a specific calendar profile and to map the power saving mode action for the calendar profile, use the **action power-saving-mode power-profile** command. Use the **no** form of this command to disable the command.

action power-saving-mode power-profile   *power-profile-name*

[no] action power-saving-mode power-profile   *power-profile-name*

Syntax Description

power-profile-name	Specifies the name of the power profile.

Command Default   None

Command Modes   AP calendar profile configuration mode.

Command History

Release	Modification
Cisco IOS XE Cupertino 17.8.1	This command was introduced.

Example

The following example shows how to map a specific power profile to a specific calendar profile and to map the power saving mode action for the calendar profile:

```
Device(config)# ap profile ap-profile-name
Device(config-ap-profile)# calendar-profile ap-calendar-profile
Device(config-ap-profile-calendar)# action power-saving-mode power-profile power-profile1
```

address

To specify the IP address of the Rivest, Shamir, and Adelman (RSA) public key of the remote peer that you will manually configure in the keyring, use the **address** command inrsa-pubkey configuration mode. To remove the IP address, use the **no** form of this command.

address *ip-address*
no address *ip-address*

Syntax Description

ip-address	IP address of the remote peer.

Command Default

No default behavior or values

Command Modes

Rsa-pubkey configuration

Command History

Release	Modification
11.3 T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.6	This command was integrated into Cisco IOS XE Release 2.6.

Usage Guidelines

Before you can use this command, you must enter the **rsa-pubkey** command in the crypto keyring mode.

Examples

The following example specifies the RSA public key of an IP Security (IPSec) peer:

```
Router(config)# crypto keyring vpnkeyring
Router(conf-keyring)# rsa-pubkey name host.vpn.com
Router(config-pubkey-key)# address 10.5.5.1
Router(config-pubkey)# key-string
Router(config-pubkey)# 00302017 4A7D385B 1234EF29 335FC973
Router(config-pubkey)# 2DD50A37 C4F4B0FD 9DADE748 429618D5
Router(config-pubkey)# 18242BA3 2EDFBDD3 4296142A DDF7D3D8
Router(config-pubkey)# 08407685 2F2190A0 0B43F1BD 9A8A26DB
Router(config-pubkey)# 07953829 791FCDE9 A98420F0 6A82045B
Router(config-pubkey)# 90288A26 DBC64468 7789F76E EE21
Router(config-pubkey)# quit
Router(config-pubkey-key)# exit
Router(conf-keyring)# exit
```

Related Commands

Command	Description
crypto keyring	Defines a crypto keyring to be used during IKE authentication.

Command	Description
key-string	Specifies the RSA public key of a remote peer.
rsa-pubkey	Defines the RSA manual key to be used for encryption or signatures during IKE authentication.

address

To configure Software-Defined Application Visibility and Control (SD-AVC) controller IP address, use the **address** command. To remove the SD-AVC controller IP address, use the **no** form of this command.

address *ipv4-address*

no address

Syntax Description	*ipv4-address*	IPv4 address of the SD-AVC controller.

Command Default Controller IP address is not configured.

Command Modes SD Service Controller Configuration (config-sd-service-controller)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Usage Guidelines Supports only IPv4 address.

Examples The following example shows how to configure SD-AVC controller IP address:

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
VM1(config)# avc sd-service
Device(config-sd-service)# controller
Device(config-sd-service-controller)# address 209.165.201.0
```

address prefix

To specify an address prefix for address assignment, use the **address prefix** command in interface configuration mode. To remove the address prefix, use the **no** form of this command.

address prefix ipv6-prefix [**lifetime** {**valid-lifetime preferred-lifetime** | **infinite**}]
no address prefix

Syntax Description	*ipv6-prefix*	IPv6 address prefix.
	lifetime {valid-lifetime preferred-lifetime | infinite}]	(Optional) Specifies a time interval (in seconds) that an IPv6 address prefix remains in the valid state. If the **infinite** keyword is specified, the time interval does not expire.

Command Default No IPv6 address prefix is assigned.

Command Modes

DHCP pool configuration (config-dhcpv6)

Command History

Release	Modification
12.4(24)T	This command was introduced.

Usage Guidelines You can use the **address prefix** command to configure one or several address prefixes in an IPv6 DHCP pool configuration. Each time the IPv6 DHCP address pool is used, an address will be allocated from each of the address prefixes associated with the IPv6 DHCP pool.

Examples The following example shows how to configure a pool called engineering with an IPv6 address prefix:

```
Router(config)# ipv6 dhcp pool engineering
Router(config-dhcpv6)# address prefix 2001:1000::0/64 lifetime infinite
```

Related Commands

Command	Description
ipv6 dhcp pool	Configures a DHCPv6 server configuration information pool and enters DHCPv6 pool configuration mode.

advice-charge

To configure advice of charge for using the service set identifier (SSID) of each of the Network Access Identifier (NAI) realm, use the **advice-charge** command. To remove the advice of charge, use the **no** form of this command.

advice-charge { **data** | **time** | **time-and-data** | **unlimited** }

Syntax Description		
	data	Specifies charges based on the data volume.
	time	Specifies charges based on time.
	time-and-data	Specifies charges based on time and data volume.
	unlimited	Specifies charges for unlimited access.

Command Default   Advice of charge is not configured.

Command Modes   Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History	Release	Modification
	Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

The following example shows how to configure advice of charge for using the SSID of each NAI realm:

```
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# advice-charge unlimited
```

airtime-fairness mode

> **Note** Cisco Air Time Fairness (ATF) must be enabled on 2.4- or 5-GHz radios separately.

To configure airtime-fairness in different modes, use the **airtime-fairness mode** command.

airtime-fairness mode { **enforce-policy** | **monitor** }

Syntax Description	**enforce-policy**	This mode signifies that the ATF is operational.
	monitor	This mode gathers information about air time and reports air time usage.

Command Default None

Command Modes RF Profile configuration (config-rf-profile)

Command History

Release	**Modification**
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure air time fairness in different modes:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap dot11 24ghz rf-profile rfprof24_1
Device(config-rf-profile)# airtime-fairness mode enforce-policy
Device(config-rf-profile)# airtime-fairness optimization
Device(config-rf-profile)# end
```

allow at-least min-number at-most max-number

To limit the number of multicast RAs per device per throttle period in an RA throttler policy, use the **allow at-least** *min-number* **at-most** *max-number* command.

allow at-least *min-number* **at-most** {*max-number* | **no-limit**}

Syntax Description	**at-least** *min-number*	Enter the minimum guaranteed number of multicast RAs per router before throttling can be enforced. Valid range is 0 to 32.
	at-most *max-number*	Enter the maximum number of multicast RAs from router by which throttling is enforced. Valid range is 0 to 256.
	at-most no-limit	No upper bound at the router level.

Command Default	None

Command Modes	config-nd-ra-throttle

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to limit the number of multicast RAs per device per throttle period in an RA throttler policy:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ipv6 nd ra-throttler policy ra-throttler-policy-name
Device(config-nd-ra-throttle)# allow at-least 5 at-most 10
```

amsdu (mesh)

To configure backhaul aggregated MAC service data unit (A-MSDU) for a mesh AP profile, use the **amsdu** command.

amsdu

Syntax Description   This command has no keywords or arguments.

Command Default   amsdu is enabled.

Command Modes   config-wireless-mesh-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to configure A-MSDU for a mesh AP profile:

```
Device # configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device (config)# wireless profile mesh mesh-profile
Device (config-wireless-mesh-profile)# amsdu
```

anqp

To configure the Generic Advertisement Service (GAS) or the Access Network Query Protocol (ANQP) protocol settings, use the **anqp** command. To remove the protocol settings, use the **no** form of the command .

anqp {**fragmentation-threshold** *fragmentation-threshold* | **gas-timeout** *gas-timeout*}

Syntax Description		
	fragmentation-threshold	ANQP reply fragmentation threshold, in bytes. Valid range is from 16-1462.
	gas-timeout	GAS request timeout, in milliseconds. Valid range is from 100-10000.

Command Default   None

Command Modes   Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure GAS request timeout:

```
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# anqp gas-timeout 100
```

anqp-domain-id

To configure the Hotspot 2.0 Access Network Query Protocol (ANQP) domain identifier, use the **anqp-domain-id** command. To remove the domain identifier, use the **no** form of the command .

anqp-domain-id *domain-id*

Syntax Description	*domain-id* ANQP domain ID. The range is from 0 to 65535.

Command Default   None

Command Modes   Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure the Hotspot 2.0 ANQP domain identifier:

```
Device(config)#wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# anqp-domain-id 100
```

antenna beam-selection

To configure beam selection of the antenna, use the **antenna beam-selection** command, in the wireless radio profile configuration mode. Use the **no** form of this command to disable the feature.

antenna beam-selection { **narrow tilt** { **10** | **20** } | **wide** }

Syntax Description	**narrow tilt** { **10**	**20** }	Configures the tilt degrees for narrow beam selection. You can configure it for 10 degrees or 20 degrees tilt.
	10	**20**	Configures the tilt degree of the narrow beam selection for 10 degrees or 20 degrees.
	wide	Configures the wide beam selection.

Command Default	None

Command Modes	Wireless radio profile configuration mode

Command History	**Release**	**Modification**
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines	None

Example

The following example shows how to configure the beam selection of the antenna:

```
Device# configure terminal
Device(config)# wireless profile radio radio-profile-name
Device(config-wireless-profile)# antenna beam-selection narrow tilt 10
```

antenna count

To configure the number of antennas to be enabled under a radio profile, use the **antenna count** command, in the radio profile configuration mode. To disable the number of antennas configured, use the **no** form of this command.

antenna count   *0 - 8*

Syntax Description	*0-8*	Specifies the antenna count.

Command Default   None

Command Modes   Wireless radio profile configuration mode

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to configure the number of antennas to be enabled under a radio profile:

```
Device# configure terminal
Device(config)# wireless profile radio radio-profile-name
Device(config-wireless-radio-profile)# antenna count 4
```

antenna monitoring

To configure antenna disconnection detection, use the **antenna monitoring** command. To disable antenna disconnection detection, use the **no** form of this command.

antenna monitoring [**rssi-failure-threshold** *threshold-value* | **weak-rssi** *weak-rssi-value* | **detection-time** *detect-time-in-mins*]

no antenna monitoring

Syntax Description		
rssi-failure-threshold *threshold-value*	Configures RSSI failure threshold value, in dB. Valid values range from 10 to 90, with a default of 40.
	The *threshold-value* determines the signal strength delta across the received antennas of the AP.
weak-rssi *weak-rssi-value*	Configures weak RSSI value, in dBm. Valid values range from -90 to -10, with a default of 60.
	If the RSSI received by the AP is greater or equal to the configured *weak-rssi-value*, the antenna is considered as broken. Configuration of the *weak-rssi-value* is based on the deployment of the neighbor AP distance.
detection-time *detect-time-in-mins*	Configures the antenna disconnection detection time, in minutes. Valid values range from 9 to 180, with a default of 120.
	The *detect-time-in-mins* is used to monitor the signal strength (both *weak-rssi-value* and *threshold-value* criteria) before flagging it as a problem.

Command Default Antenna monitoring is not enabled.

Command Modes AP profile configuration (config-ap-profile)

Command History	Release	Modification
	Cisco IOS XE Bengaluru 17.4.1	This command was introduced.

Usage Guidelines This command is supported only on the following APs:

- Cisco Catalyst 9120AX Series Access Points

- Cisco Catalyst 9130AX Series Access Points

- Cisco Aironet 2800e Access Points

- Cisco Aironet 3800e Access Points

Example

The following example shows how to enable antenna disconnection detection:

```
Device# configure terminal
Device(config)# ap profile xyz-ap-profile
Device(config-ap-profile)# antenna monitoring
```

ap

To configure cisco APs, use the **ap** command.

ap *mac-address*

Syntax Description	*mac-address* Ethernet MAC address of the AP.

Command Default   None

Command Modes   config

Command History

Release	Modification
Cisco IOS XE Everest 16.6.1	This command was introduced.

Usage Guidelines   none.

Example

The following example shows how to configure a Cisco AP:

```
Device(config)# ap F866.F267.7DFB
```

ap audit-report

To enable or configure AP audit reporting, use the **ap audit-report** command.

ap audit-report {**enable** | **interval** *interval*}

Syntax Description	enable	Enables AP audit reporting.
	interval	Configures the AP audit report interval.
	interval	AP audit report interval, in minutes. Default is 1440. The valid range is from 0 to 43200.

Command Default None

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

The following example shows how to configure AP audit report interval:

```
Device(config)# ap audit-report interval 1300
```

ap auth-list

To configure the AP authorization list, use the **ap auth-list** command in the global configuration mode. To disable the AP authorization list, use the **no** form of this command.

ap auth-list {**authorize-mac** | **authorize-serialNum** | **method-list** *method-list-name*}

no ap auth-list {**authorize-mac** | **authorize-serialNum** | **method-list** *method-list-name*}

Syntax Description	**authorize-mac**	Configures the AP authorization policy with MAC.
	auhorize-serialNum	Configures the AP authorization policy with the serial number.
	method-list	Configures the AP authorization method list.
	method-list-name	Indicates the method list name.

Command Default	None
Command Modes	Global configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

The following example shows how to configure the AP authorization policy with serial number:

```
Device(config) #ap auth-list authorize-serialNum
```

ap auth-list ap-cert-policy allow-mic-ap

To enable the AP certificate policy during CAPWAP-DTLS handshake, use the **ap auth-list ap-cert-policy allow-mic-ap** command, in the global configuration mode. To disable the AP certificate policy during CAPWAP-DTLS handshake, use the **no** form of this command.

ap auth-list ap-cert-policy allow-mic-ap

no ap auth-list ap-cert-policy allow-mic-ap

Syntax Description	This command has no arguments or keywords.

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Example

The following example shows how to configure AP certificate policy during CAPWAP-DTLS handshake:

```
Device# configure terminal
Device(config)# ap auth-list ap-cert-policy
Device(config)# ap auth-list ap-cert-policy allow-mic-ap
```

ap auth-list ap-cert-policy allow-mic-ap trustpoint

To configure the trustpoint name for the controller certificate chain, use the **ap auth-list ap-cert-policy allow-mic-ap trustpoint** command, in the global configuration mode. To disable the feature, use the **no** form of the command.

ap auth-list ap-cert-policy allow-mic-ap trustpoint

no ap auth-list ap-cert-policy allow-mic-ap trustpoint

Syntax Description	*trustpoint-name* Specifies the trustpoint name for the wireless controller certificate chain.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Example

The following example shows how to the trustpoint name for the controller certificate chain:

```
Device# configure terminal
Device(config)# ap auth-list ap-cert-policy
Device(config)# ap auth-list ap-cert-policy allow-mic-ap trustpoint trustpoint-name
```

ap auth-list ap-cert-policy mac-address MAC-address | serial-number AP-serial-number policy-type mic

To configure the AP certificate policy based on the Ethernet MAC address or based on the assembly serial number of the AP, use the **ap auth-list ap-cert-policy** {**mac-address** *H.H.H* | **serial-number** *AP-serial-number*} **policy-type mic** command. Use the **no** form of this command to disable the feature.

ap auth-list ap-cert-policy { **mac-address** *H.H.H* | **serial-number** *AP-serial-number* } **policy-type mic**

no ap auth-list ap-cert-policy { **mac-address** *H.H.H* | **serial-number** *AP-serial-number* } **policy-type mic**

Syntax Description

ap auth-list	Configure the authorization list of the Access Point.
ap-cert-policy	Specifies the AP Certificate Policy during CAPWAP DTLS.
mac-address *MAC-address*	Configures AP cert policy based on Ethernet MAC.
serial-number *AP-serial-number*	Configure AP cert policy based on Serial Number.
policy-type	Configures AP certificate policy type.
mic	Selects MIC AP policy.

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Example

The following example shows how to configure the AP certificate policy based on the Ethernet MAC address or based on the assembly serial number of the AP:

```
Device# configure terminal
Device(config)# ap auth-list ap-cert-policy mac-address 10.1.1 policy-type mic

Device(config)# ap auth-list ap-cert-policy serial-number ap-serial-number policy-type mic
```

ap auth-list ap-policy

To configure authorization policy for all Cisco lightweight access points joined to the device, use the **ap auth-list ap-policy** command. To disable authorization policy for all Cisco lightweight access points joined to the device, use the **no** form of this command.

ap auth-list ap-policy {**authorize-ap** | **lsc** | **mic** | **ssc**}
no ap auth-list ap-policy {**authorize-ap** | **lsc** | **mic** | **ssc**}

Syntax Description		
authorize-ap	Enables the authorization policy.	
lsc	Enables access points with locally significant certificates to connect.	
mic	Enables access points with manufacture-installed certificates to connect.	
ssc	Enables access points with self signed certificates to connect.	

Command Default None

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to enable the access point authorization policy:

```
Device(config)# ap auth-list ap-policy authorize-ap
```

This example shows how to enable access points with locally significant certificates to connect:

```
Device(config)# ap auth-list ap-policy lsc
```

This example shows how to enable access points with manufacture-installed certificates to connect:

```
Device(config)# ap auth-list ap-policy mic
```

This example shows how to enable access points with self-signed certificates to connect:

```
Device(config)# ap auth-list ap-policy ssc
```

ap capwap multicast

To configure the multicast address used by all access points to receive multicast traffic when multicast forwarding is enabled and to configure the outer Quality of Service (QoS) level of those multicast packets sent to the access points, use the **ap capwap multicast** command.

ap capwap multicast {*multicast-ip-address* | **service-policy output** *pollicymap-name*}

Syntax Description	*multicast-ip-address*	Multicast IP address.
	service-policy	Specifies the tunnel QoS policy for multicast access points.
	output	Assigns a policy map name to the output.
	policymap-name	Service policy map name.

Command Default	None

Command Modes	Global configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure a multicast address used by all access points to receive multicast traffic when multicast forwarding is enabled:

```
Device(config)# ap capwap multicast 239.2.2.2
```

This example shows how to configure a tunnel multicast QoS service policy for multicast access points:

```
Device(config)# ap capwap multicast service-policy output tunnmulpolicy
```

ap capwap retransmit

To configure Control and Provisioning of Wireless Access Points (CAPWAP) control packet retransmit count and control packet retransmit interval under the AP profile, use the **ap capwap retransmit** command.

ap profile default-ap-profile

ap capwap retransmit {**count** *retransmit-count* | **interval** *retransmit-interval*}

Syntax Description	**count** *retransmit-count*	Specifies the access point CAPWAP control packet retransmit count.
		Note The count is from 3 to 8 seconds.
	interval *retransmit-interval*	Specifies the access point CAPWAP control packet retransmit interval.
		Note The interval is from 2 to 5 seconds.

Command Default	None

Command Modes	AP profile configuration (config-ap-profile)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure the CAPWAP control packet retransmit count for an access point:

```
Device# ap capwap retransmit count 3
```

This example shows how to configure the CAPWAP control packet retransmit interval for an access point:

```
Device# ap capwap retransmit interval 5
```

ap capwap timers

To configure advanced timer settings under the AP profile mode, use the **ap capwap timers** command.

ap profile default-ap-profile

ap capwap timers {**discovery-timeout** *seconds* | **fast-heartbeat-timeout local** *seconds* | **heartbeat-timeout** *seconds* | **primary-discovery-timeout** *seconds* | **primed-join-timeout** *seconds*}

Syntax Description		
discovery-timeout	Specifies the Cisco lightweight access point discovery timeout.	
	Note	The Cisco lightweight access point discovery timeout is how long a Cisco device waits for an unresponsive access point to answer before considering that the access point failed to respond.
seconds	Cisco lightweight access point discovery timeout from 1 to 10 seconds.	
	Note	The default is 10 seconds.
fast-heartbeat-timeout local	Enables the fast heartbeat timer that reduces the amount of time it takes to detect a device failure for local or all access points.	
seconds	Small heartbeat interval (from 1 to 10 seconds) that reduces the amount of time it takes to detect a device failure.	
	Note	The fast heartbeat time-out interval is disabled by default.
heartbeat-timeout	Specifies the Cisco lightweight access point heartbeat timeout.	
	Note	The Cisco lightweight access point heartbeat timeout controls how often the Cisco lightweight access point sends a heartbeat keep-alive signal to the Cisco device.
		This value should be at least three times larger than the fast heartbeat timer.
seconds	Cisco lightweight access point heartbeat timeout value from 1 to 30 seconds.	
	Note	The default is 30 seconds.
primary-discovery-timeout	Specifies the access point primary discovery request timer. The timer determines the amount of time taken by an access point to discovery the configured primary, secondary, or tertiary device.	
seconds	Access point primary discovery request timer from 30 to 3600 seconds.	
	Note	The default is 120 seconds.

primed-join-timeout	Specifies the authentication timeout. Determines the time taken by an access point to determine that the primary device has become unresponsive. The access point makes no further attempts to join the device until the connection to the device is restored.
seconds	Authentication response timeout from 120 to 43200 seconds. **Note** The default is 120 seconds.

Command Default	None

Command Modes	AP profile mode (config-ap-profile)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure an access point discovery timeout with the timeout value of 7:

```
Device(config)# ap profile default-ap-profile

Device(config-ap-profile)# ap capwap timers discovery-timeout 7
```

This example shows how to enable the fast heartbeat interval for all access points:

```
Device(config)# ap profile default-ap-profile

Device(config-ap-profile)# ap capwap timers fast-heartbeat-timeout 6
```

This example shows how to configure an access point heartbeat timeout to 20:

```
Device(config)# ap profile default-ap-profile

Device(config-ap-profile)# ap capwap timers heartbeat-timeout 20
```

This example shows how to configure the access point primary discovery request timer to 1200 seconds:

```
Device(config)# ap profile default-ap-profile

Device(config-ap-profile)# ap capwap timers primary-discovery-timeout 1200
```

This example shows how to configure the authentication timeout to 360 seconds:

```
Device(config)# ap profile default-ap-profile

Device(config-ap-profile)# ap capwap timers primed-join-timeout 360
```

ap cisco-dna token

To configure Cisco DNA token, use the **ap cisco-dna token** command. To disable the configuration, use the no form of the command.

ap cisco-dna token   { **0** | **8** } *<cisco-token-number>*

no ap cisco-dna token

Syntax Description	**Cisco-dna**	Configures Cisco DNA parameters.
	token	Configures Cisco DNA token.

Command Default	None

Command Modes	Global Configuration mode

Command History	Release	Modification
	Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Usage Guidelines	None

Example

The following example shows how to configure Cisco DNA token:

```
Device(config)# ap cisco-dna token 0 <cisco-token-number>
```

ap country

To configure one or more country codes for a device, use the **ap country** command.

ap country *country-code*

Syntax Description	*country-code*	Two-letter or three-letter country code or several country codes separated by a comma.

Command Default   US (country code of the United States of America).

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
Cisco IOS XE Amsterdam 17.3.1	This command has been deprecated.
	Note From Cisco IOS XE Amsterdam 17.3.1 onwards, the command **ap country** is deprecated and renamed as **wireless country** *<1 country code>,* where you can enter country codes for more than 20 countries. Although the existing command **ap country** is still functional, it is recommended that you use the **wireless country** *<1 country code>* command.

Usage Guidelines   The Cisco device must be installed by a network administrator or qualified IT professional and the installer must select the proper country code. Following installation, access to the unit should be password protected by the installer to maintain compliance with regulatory requirements and to ensure proper unit functionality. See the related product guide for the most recent country codes and regulatory domains.

This example shows how to configure country codes on the device to IN (India) and FR (France):

```
Device(config)# ap country IN,FR
```

ap dot11 24ghz | 5ghz dot11ax spatial-reuse obss-pd

To configure the 802.11ax OBSS PD based spatial reuse on all 2.4-GHz or 5-GHz radios, use the **ap dot11** { **24ghz** | **5ghz** } **dot11ax spatial-reuse obss-pd** command. To disable the OBSS based spatial reuse feature, use the **no** form of this command.

ap dot11 { **24ghz** | **5ghz** } **dot11ax spatial-reuse obss-pd**

no ap dot11 { **24ghz** | **5ghz** } **dot11ax spatial-reuse obss-pd**

Syntax Description	This command has no arguments or keywords.
Command Default	None
Command Modes	Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.4.1	This command was introduced.

Example

The following example shows how to configure the 802.11ax OBSS PD based spatial reuse:

```
Device(config)# ap dot11 24ghz or 5ghz dot11ax spatial-reuse obss-pd
```

ap dot11 24ghz | 5ghz dot11ax spatial-reuse obss-pd non-srg-max

To configure 802.11ax non-Spatial Reuse Groups (SRG) OBSS PD max on all 2.4-GHz or 5-GHz radios, use the **ap dot11** {**24ghz** | **5ghz**} **dot11ax spatial-reuse obss-pd non-srg-max** *-82 - -62* command. To disable the 802.11ax non-Spatial Reuse Groups (SRG) OBSS PD max on all 2.4-GHz or 5-GHz radios, use the **no** form of this command.

ap dot11 { **24ghz** | **5ghz** } **dot11ax spatial-reuse obss-pd non-srg-max** *-82 - -62*

no ap dot11 { **24ghz** | **5ghz** } **dot11ax spatial-reuse obss-pd non-srg-max** *-82 - -62*

Syntax Description

-82 - -62	Specifies the non-SRG OBSS PD max value in dBm

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.4.1	This command was introduced.

Example

The following example shows how to configure 802.11ax non-SRG OBSS PD max on all 2.4-GHz or 5-GHz radios.:

```
Device(config)# ap dot11 24ghz or 5ghz dot11ax spatial-reuse obss-pd non-srg-max -80
```

ap dot11 24ghz | 5ghz rrm ndp-mode

To configure the operating mode for 802.11a neighbor discovery, use the **ap dot11** {**24ghz** | **5ghz**} **rrm ndp-mode** command.

ap dot11 { **24ghz** | **5ghz** } **rrm ndp-mode** { **auto** | **off-channel** }

Syntax Description

auto	Enables the auto mode.
off-channel	Enables NDP packets on RF ASIC radio.

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Example

The following example shows how to configure the operating mode for 802.11a neighbor discovery:

```
Device# configure terminal
Device(config)# ap dot11 24ghz or 5ghz rrm ndp-mode auto
```

ap dot11 24ghz cleanair

To enable CleanAir for detecting 2.4-GHz devices, use the **ap dot11 24ghz cleanair** command in global configuration mode. To disable CleanAir for detecting 2.4-GHz devices, use the **no** form of this command.

ap dot11 24ghz cleanair

Syntax Description	This command has no arguments or keywords.
Command Default	Disabled.
Command Modes	Global configuration (config).

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   You must enable this CleanAir command before you configure other CleanAir commands.

This example shows how to enable CleanAir for 2.4-GHz devices:

```
Device(config)# ap dot11 24ghz cleanair
```

default ap dot11 24ghz cleanair device

To configure the default state of report generation for 2.4-GHz interference devices, use the **default ap dot11 24ghz cleanair device** command in global configuration mode.

default ap dot11 24ghz cleanair device {**ble-beacon** | **bt-discovery** | **bt-link** | **canopy** | **cont-tx** | **dect-like** | **fh** | **inv** | **jammer** | **mw-oven** | **nonstd** | **report** | **superag** | **tdd-tx** | **video** | **wimax-fixed** | **wimax-mobile** | **xbox** | **zigbee**}

Syntax Description

ble-beacon	Configure the BLE beacon feature.
bt-discovery	Configures the alarm for Bluetooth interference devices.
bt-link	Configures the alarm for any Bluetooth link.
canopy	Configures the alarm for canopy interference devices.
cont-tx	Configures the alarm for continuous transmitters.
dect-like	Configures the alarm for Digital Enhanced Cordless Communication (DECT)-like phones.
fh	Configures the alarm for 802.11 frequency hopping devices.
inv	Configures the alarm for devices using spectrally inverted Wi-Fi signals.
jammer	Configures the alarm for jammer interference devices.
mw-oven	Configures the alarm for microwave ovens.
nonstd	Configures the alarm for devices using nonstandard Wi-Fi channels.
superag	Configures the alarm for 802.11 SuperAG interference devices.
tdd-tx	Configures the alarm for Time Division Duplex (TDD) transmitters.
video	Configures the alarm for video cameras.

wimax-fixed	Configures the alarm for WiMax fixed interference devices.
wimax-mobile	Configures the alarm for WiMax mobile interference devices.
xbox	Configures the alarm for Xbox interference devices.
zigbee	Configures the alarm for 802.15.4 interference devices.

Command Default   The alarm for Wi-Fi inverted devices is enabled. The alarm for all other devices is disabled.

Command Modes   Global configuration (config).

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
	This command was modified. The **ble-beacon** keyword was added.

Usage Guidelines   You must enable CleanAir using the **ap dot11 24ghz cleanair**command before you configure this command.

This example shows how to enable CleanAir to report when a video camera interferes:

```
Device(config)# default ap dot11 24ghz cleanair device video
```

ap dot11 24ghz dot11g

To enable the Cisco wireless LAN solution 802.11g network, use the **ap dot11 24ghz dot11g** command. To disable the Cisco wireless LAN solution 802.11g network, use the **no** form of this command.

ap dot11 24ghz dot11g
no ap dot11 24ghz dot11g

Syntax Description	This command has no keywords and arguments.

Command Default   Enabled

Command Modes   Global configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   Before you enter the **ap dot11 24ghz dot11g** command, disable the 802.11 Cisco radio with the **ap dot11 24ghz shutdown** command.

After you configure the support for the 802.11g network, use the **no ap dot11 24ghz shutdown** command to enable the 802.11 2.4 Ghz radio.

This example shows how to enable the 802.11g network:

```
Device(config)# ap dot11 24ghz dot11g
```

ap dot11 24ghz rate

To configure 802.11b operational rates, use the **ap dot11 24ghz rate** command.

ap dot11 24ghz rate {**RATE_11M** | **RATE_12M** | **RATE_18M** | **RATE_1M** | **RATE_24M** | **RATE_2M** | **RATE_36M** | **RATE_48M** | **RATE_54M** | **RATE_5_5M** | **RATE_6M** | **RATE_9M**} {**disable** | **mandatory** | **supported**}

Syntax Description		
	RATE_11M	Configures the data to be transmitted at the rate of 11 Mbps
	RATE_12M	Configures the data to be transmitted at the rate of 12 Mbps
	RATE_18M	Configures the data to be transmitted at the rate of 18 Mbps
	RATE_1M	Configures the data to be transmitted at the rate of 1 Mbps
	RATE_24M	Configures the data to be transmitted at the rate of 24 Mbps
	RATE_2M	Configures the data to be transmitted at the rate of 2 Mbps
	RATE_36M	Configures the data to be transmitted at the rate of 36 Mbps
	RATE_48M	Configures the data to be transmitted at the rate of 48 Mbps
	RATE_54M	Configures the data to be transmitted at the rate of 54 Mbps
	RATE_5_5M	Configures the data to be transmitted at the rate of 5.5 Mbps
	RATE_6M	Configures the data to be transmitted at the rate of 6 Mbps
	RATE_9M	Configures the data to be transmitted at the rate of 9 Mbps
	disable	Disables the data rate that you specify. Also defines that the clients specify the data rates used for communication.
	mandatory	Defines that the clients support this data rate in order to associate with an AP.
	supported	Any associated clients support this data rate can communicate with the AP using this rate. However, the clients are not required to use this rate to associate with the AP.

Command Default None

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure 802.11b operational rate to 9 Mbps and make it mandatory:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap dot11 24ghz rate RATE_9M mandatory
```

ap dot11 24ghz rrm channel cleanair-event

To enable Event-Driven RRM (EDRRM) and the sensitivity for 2.4-GHz devices, use the **ap dot11 24ghz rrm channel cleanair-event** command in global configuration mode. To disable EDRRM, use the **no** form of this command.

ap dot11 24ghz rrm channel cleanair-event sensitivity {**high** | **low** | **medium**}
no ap dot11 24ghz rrm channel cleanair-event [**sensitivity**{**high** | **low** | **medium**}]

Syntax Description		
sensitivity	(Optional) Configures the EDRRM sensitivity of the CleanAir event.	
high	(Optional) Specifies the highest sensitivity to non-Wi–Fi interference as indicated by the air quality (AQ) value.	
low	(Optional) Specifies the least sensitivity to non-Wi–Fi interference as indicated by the AQ value.	
medium	(Optional) Specifies medium sensitivity to non-Wi–Fi interference as indicated by the AQ value.	

Command Default EDRRM is disabled and the sensitivity is low.

Command Modes Global configuration (config).

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines You must enable EDRRM using the **ap dot11 24ghz rrm channel cleanair-event** command before you configure the sensitivity.

This example shows how to enable EDRRM and set the EDRRM sensitivity to low:

```
Device(config)# ap dot11 24ghz rrm channel cleanair-event
Device(config)# ap dot11 24ghz rrm channel cleanair-event sensitivity low
```

ap dot11 24ghz rrm channel device

To configure persistent non-Wi-Fi device avoidance in the 802.11b channel, use the **ap dot11 24ghz rrm channel device** command in global configuration mode. To disable persistent device avoidance, use the **no** form of this command.

ap dot11 24ghz rrm channel device
no ap dot11 24ghz rrm channel device

Syntax Description	This command has no arguments or keywords.
Command Default	Persistent device avoidance is disabled.
Command Modes	Global configuration (config).

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

CleanAir-capable monitor mode access points collect information about persistent devices on all configured channels and stores the information in the device. Local and bridge mode access points detect interference devices on the serving channels only.

This example shows how to enable persistent device avoidance:

```
Device(config)# ap dot11 24ghz rrm channel device
```

ap dot11 24ghz rrm optimized-roam

To configure optimized roaming for 802.11b network, use the **ap dot11 24ghz rrm optimized-roam** command.

ap dot11 24ghz rrm optimized-roam [**data-rate-threshold** {**11M** | **12M** | **18M** | **1M** | **24M** | **2M** | **36M** | **48M** | **54M** | **5_5M** | **6M** | **9M** | **disable**}]

Syntax Description		
	data-rate-threshold	Configures the data rate threshold for 802.11b optimized roaming.
	11M	Sets the data rate threshold for 802.11b optimized roaming to 11 Mbps
	12M	Sets the data rate threshold for 802.11b optimized roaming to of 12 Mbps
	18M	Sets the data rate threshold for 802.11b optimized roaming to of 18 Mbps
	1M	Sets the data rate threshold for 802.11b optimized roaming to of 1 Mbps
	24M	Sets the data rate threshold for 802.11b optimized roaming to of 24 Mbps
	2M	Sets the data rate threshold for 802.11b optimized roaming to of 2 Mbps
	36M	Sets the data rate threshold for 802.11b optimized roaming to of 36 Mbps
	48M	Sets the data rate threshold for 802.11b optimized roaming to of 48 Mbps
	54M	Sets the data rate threshold for 802.11b optimized roaming to of 54 Mbps
	5_5M	Sets the data rate threshold for 802.11b optimized roaming to of 5.5 Mbps
	6M	Sets the data rate threshold for 802.11b optimized roaming to of 6 Mbps
	9M	Sets the data rate threshold for 802.11b optimized roaming to of 9 Mbps
	disable	Disables the data rate threshold.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure optimized roaming for 802.11b network:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap dot11 24ghz rrm optimized-roam
```

ap dot11 24ghz rx-sop threshold

To configure 802.11b radio receiver start-of-packet (RxSOP), use the **ap dot11 24ghz rx-sop threshold** command.

ap dot11 24ghz rx-sop threshold {**auto** | **high** | **low** | **medium** | **custom** *rxsop-value*}

Syntax Description

auto	Reverts RxSOP value to the default value.
high	Sets the RxSOP value to high threshold (–79 dBm).
medium	Sets the RxSOP value to medium threshold (–82 dBm).
low	Sets the RxSOP value to low threshold (–85 dBm).
custom *rxsop-value*	Sets the RxSOP value to custom threshold (–85 dBm to –60 dBm)

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines   RxSOP determines the Wi-Fi signal level in dBm at which an access point's radio demodulates and decodes a packet. Higher the level, less sensitive the radio is and smaller the receiver cell size. The table below shows the RxSOP threshold values for high, medium, low, and custom levels for 2.4-GHz band.

Table 4: RxSOP Thresholds for 2.4-GHz Band

High Threshold	Medium Threshold	Low Threshold	Custom Threshold
–79 dBm	–82 dBm	–85 dBm	–85 dBm to –60 dBm

Examples

The following example shows how to configure 802.11b radio receiver start-of-packet (RxSOP) value to auto:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap dot11 24ghz rx-sop threshold auto
```

ap dot11 24ghz shutdown

To disable 802.11a network, use the **ap dot11 24ghz shutdown** command.

ap dot11 24ghz shutdown

Command Default	None
Command Modes	Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to disable the 802.11a network:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap dot11 24ghz shutdown
```

ap dot11 5ghz channelswitch quiet

To configure the 802.11h channel switch quiet mode, use the **ap dot11 5ghz channelswitch quiet** command.

ap dot11 5ghz channelswitch quiet

Command Default	None
Command Modes	Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the 802.11h channel switch quiet mode:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap dot11 5ghz channelswitch quiet
```

ap dot11 5ghz cleanair

To enable CleanAir for detecting 5-GHz devices, use the **ap dot11 5ghz cleanair** command in global configuration mode.

ap dot11 5ghz cleanair

Command Default Disabled.

Command Modes Global configuration.

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines You must enable this CleanAir command before you configure other CleanAir commands.

This example shows how to enable CleanAir for 5-GHz devices:

```
Device(config)# ap dot11 5ghz cleanair
```

default ap dot11 5ghz cleanair device

To configure the default state of the alarm for 5-GHz interference devices, use the **default ap dot11 5ghz cleanair device** command in global configuration mode.

default ap dot11 5ghz cleanair device {**canopy** | **cont-tx** | **dect-like** | **inv** | **jammer** | **nonstd** | **radar** | **report** | **superag** | **tdd-tx** | **video** | **wimax-fixed** | **wimax-mobile**}

Syntax Description		
canopy	Configures the alarm for canopy interference devices.
cont-tx	Configures the alarm for continuous transmitters.
dect-like	Configures the alarm for Digital Enhanced Cordless Communication (DECT)-like phones.
inv	Configures the alarm for devices using spectrally inverted Wi-Fi signals.
jammer	Configures the alarm for jammer interference devices.
nonstd	Configures the alarm for devices using nonstandard Wi-Fi channels.
radar	Configures the alarm for radars.
report	Enables interference device reports.
superag	Configures the alarm for 802.11 SuperAG interference devices.
tdd-tx	Configures the alarm for Time Division Duplex (TDD) transmitters.
video	Configures the alarm for video cameras.
wimax-fixed	Configures the alarm for WiMax fixed interference devices.
wimax-mobile	Configures the alarm for WiMax mobile interference devices.

Command Default The alarm for Wi-Fi inverted devices is enabled. The alarm for all other interference devices is disabled.

Command Modes Global configuration (config).

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines You must enable CleanAir using the **ap dot11 5ghz cleanair** command before you configure this command.

This example shows how to enable CleanAir to report when a video camera interferes:

```
Device(config)# default ap dot11 5ghz cleanair device video
```

ap dot11 5ghz power-constraint

To configure the 802.11h power constraint value, use the **ap dot11 5ghz power-constraint** command. To remove the 802.11h power constraint value, use the **no** form of this command.

ap dot11 5ghz power-constraint *value*
no ap dot11 5ghz power-constraint

Syntax Description	*value*	802.11h power constraint value.
	Note	The range is from 0 to 30 dBm.

Command Default   None

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure the 802.11h power constraint to 5 dBm:

```
Device(config)# ap dot11 5ghz power-constraint 5
```

ap dot11 5ghz rate

To configure 802.11a operational rates, use the **ap dot11 5ghz rate** command.

ap dot11 5ghz rate {**RATE_12M** | **RATE_18M** | **RATE_24M** | **RATE_36M** | **RATE_48M** | **RATE_54M** | **RATE_6M** | **RATE_9M**} {**disable** | **mandatory** | **supported**}

Syntax Description	**RATE_12M**	Configures the data to be transmitted at the rate of 12 Mbps
	RATE_18M	Configures the data to be transmitted at the rate of 18 Mbps
	RATE_24M	Configures the data to be transmitted at the rate of 24 Mbps
	RATE_36M	Configures the data to be transmitted at the rate of 36 Mbps
	RATE_48M	Configures the data to be transmitted at the rate of 48 Mbps
	RATE_54M	Configures the data to be transmitted at the rate of 54 Mbps
	RATE_6M	Configures the data to be transmitted at the rate of 6 Mbps
	RATE_9M	Configures the data to be transmitted at the rate of 9 Mbps
	disable	Disables the data rate that you specify. Also defines that the clients specify the data rates used for communication.
	mandatory	Defines that the clients support this data rate in order to associate with an AP.
	supported	Any associated clients support this data rate can communicate with the AP using this rate. However, the clients are not required to use this rate to associate with the AP.

Command Default	None

Command Modes	Global configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure 802.11a operational rate to 24 Mbps and make it supported:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap dot11 5ghz rate RATE_24M supported
```

ap dot11 5ghz rrm channel cleanair-event

To enable Event-Driven RRM (EDRRM) and configure the sensitivity for 5-GHz devices, use the **ap dot11 5ghz rrm channel cleanair-event** command in global configuration mode. To disable EDRRM, use the **no** form of the command.

ap dot11 5ghz rrm channel cleanair-event [**sensitivity** {**high** | **low** | **medium**}]
no ap dot11 5ghz rrm channel cleanair-event [**sensitivity** {**high** | **low** | **medium**}]

Syntax Description		
sensitivity	(Optional) Configures the EDRRM sensitivity of the CleanAir event.	
high	(Optional) Specifies the highest sensitivity to non-Wi–Fi interference as indicated by the air quality (AQ) value.	
low	(Optional) Specifies the least sensitivity to non-Wi–Fi interference as indicated by the AQ value.	
medium	(Optional) Specifies medium sensitivity to non-Wi–Fi interference as indicated by the AQ value.	

Command Default   EDRRM is disabled and the EDRRM sensitivity is low.

Command Modes   Global configuration (config).

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   You must enable EDRRM using the **ap dot11 5ghz rrm channel cleanair-event** command before you configure the sensitivity.

This example shows how to enable EDRRM and set the EDRRM sensitivity to high:

```
Device(config)# ap dot11 5ghz rrm channel cleanair-event
Device(config)# ap dot11 5ghz rrm channel cleanair-event sensitivity high
```

ap dot11 5ghz rrm channel device

To configure persistent non-Wi-Fi device avoidance in the 802.11a channel, use the **ap dot11 5ghz rrm channel device** command in global configuration mode. To disable persistent device avoidance, use the **no** form of this command.

ap dot11 5ghz rrm channel device
no ap dot11 5ghz rrm channel device

Syntax Description This command has no arguments or keywords.

Command Default The CleanAir persistent device state is disabled.

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines CleanAir-capable monitor mode access points collect information about persistent devices on all configured channels and stores the information in the device. Local and bridge mode access points detect interference devices on the serving channels only.

This example shows how to enable persistent device avoidance on 802.11a devices:

```
Device(config)# ap dot11 5ghz rrm channel device
```

ap dot11 5ghz rrm channel zero-wait-dfs

To enable thes Zero Wait Dynamic Frequency Selection feature globally on 5-GHz devices, use the **ap dot11 5ghz rrm channel zero-wait-dfs** command. To disable the feature, use the **no** form of this command.

ap dot11 5ghz rrm channel zero-wait-dfs

no ap dot11 5ghz rrm channel zero-wait-dfs

Syntax Description   This command has no arguments or keywords.

Command Default   The Zero Wait Dynamic Frequency Selection feature is not enabled.

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Usage Guidelines   This command is applicable only on 5-GHz devices.

Examples   The following example shows how to enable the Zero Wait Dynamic Frequency Selection feature on 5-GHz devices:

```
Device# configure terminal
Device(config)# ap dot11 5ghz rrm channel zero-wait-dfs
```

ap dot11 5ghz rx-sop threshold

To configure 802.11a radio receiver start-of-packet (RxSOP), use the **ap dot11 5ghz rx-sop threshold** command.

ap dot11 5ghz rx-sop threshold {**auto** | **high** | **low** | **medium** | **custom** *rxsop-value*}

Syntax Description		
auto	Reverts RxSOP value to the default value.
high	Sets the RxSOP value to high threshold (–76 dBm).
medium	Sets the RxSOP value to medium threshold (–78 dBm).
low	Sets the RxSOP value to low threshold (–80 dBm).
custom *rxsop-value*	Sets the RxSOP value to custom threshold (–85 dBm to –60 dBm)

Command Default   None

Command Modes   config

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines   RxSOP determines the Wi-Fi signal level in dBm at which an access point's radio demodulates and decodes a packet. Higher the level, less sensitive the radio is and smaller the receiver cell size. The table below shows the RxSOP threshold values for high, medium, low, and custom levels for 5-GHz band.

Table 5: RxSOP Thresholds for 5-GHz Band

High Threshold	Medium Threshold	Low Threshold	Custom Threshold
–76 dBm	–78 dBm	–80 dBm	–85 dBm to –60 dBm

Examples

The following example shows how to configure 802.11b radio receiver start-of-packet (RxSOP) value to a custom value of –70 dBm:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap dot11 24ghz rx-sop threshold custom -70
```

ap dot11 5ghz shutdown

To disable 802.11a network, use the **ap dot11 5ghz shutdown** command.

ap dot11 5ghz shutdown

Command Default	None
Command Modes	Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to disable the 802.11a network:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap dot11 5ghz shutdown
```

ap dot11 5ghz smart-dfs

To configure to use nonoccupancy time for radar interference channel, use the **ap dot11 5ghz smart-dfs** command.

ap dot11 5ghz smart-dfs

Command Default	None
Command Modes	config

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure to use nonoccupancy time for radar interference channel:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap dot11 5ghz smart-dfs
```

ap dot11 6ghz cleanair

To configure the CleanAir features for the 6-GHz radios, use the **ap dot11 6ghz cleanair** command. Use the **no** form of this command to disable the feature.

ap dot11 6ghz cleanair

no ap dot11 6ghz cleanair

Syntax Description	This command has no arguments or keywords.

Command Default None

Command Modes Global Configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	The command was introduced.

Example

This example shows how to configure the CleanAir features for the 6-GHz radios:

```
Device# ap dot11 6ghz cleanair
```

ap dot11 6ghz rf-profile

To configure the RF profile for 802.11 6-GHz parameters, use the **ap dot11 6ghz rf-profile**

ap dot11 6ghz rf-profile   *rf-profile-name*

Syntax Description	*rf-profile-name*	Specifies the RF profile name.

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

This example shows how to configure the RF profile for 802.11 6-GHz parameters:

```
Device(config)# ap dot11 6ghz rf-profile rf-profile-name
```

ap dot11

To configure Spectrum Intelligence (SI) on Qualcomm based 2.4 GHz or 5 GHz radios, use the **ap dot11 SI** command.

ap dot11 {**24ghz** | **5ghz** } **SI**

Syntax Description	**24ghz**	2.4 GHz radio
	5ghz	5 GHz radio
	SI	Enable Spectrum Intelligence (SI). [no] in the command disasbles SI.

Command Default	None

Command Modes	Global configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to enable SI on 5GHz radio:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap dot11 5ghz SI
```

ap dot11 beaconperiod

To change the beacon period globally for 2.4 GHz or 5 GHz bands, use the **ap dot11 beaconperiod** command.

> **Note**   Disable the 802.11 network before using this command. See the "Usage Guidelines" section.

ap dot11 {**24ghz** | **5ghz**} **beaconperiod** *time*

Syntax Description		
24ghz	Specifies the settings for 2.4 GHz band.	
5ghz	Specifies the settings for 5 GHz band.	
beaconperiod	Specifies the beacon for a network globally.	
time	Beacon interval in time units (TU). One TU is 1024 microseconds. The range is from 20 to 1000.	

Command Default   None

Command Modes   Global configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   In Cisco wireless LAN 802.11 networks, all Cisco lightweight access point wireless LANs broadcast a beacon at regular intervals. This beacon notifies clients that the wireless service is available and allows the clients to synchronize with the lightweight access point.

Before you change the beacon period, make sure that you have disabled the 802.11 network by using the **ap dot11** {**24ghz** | **5ghz**} **shutdown** command. After changing the beacon period, enable the 802.11 network by using the **no ap dot11** {**24ghz** | **5ghz**} **shutdown** command.

This example shows how to configure the 5 GHZ band for a beacon period of 120 time units:

```
Device(config)# ap dot11 5ghz beaconperiod 120
```

ap dot11 cac media-stream

To configure media stream Call Admission Control (CAC) voice and video quality parameters for 2.4 GHz and 5 GHz bands, use the **ap dot11 cac media-stream** command.

ap dot11 {**24ghz** | **5ghz**} **cac media-stream multicast-direct** {**max-retry-percent** *retryPercent* | **min-client-rate** {**eighteen** | **eleven** | **fiftyFour** | **fivePointFive** | **fortyEight** | **nine** | **oneFifty** | **oneFortyFourPointFour** | **oneThirty** | **oneThirtyFive** | **seventyTwoPointTwo** | **six** | **sixtyFive** | **thirtySix** | **threeHundred** | **twelve** | **twentyFour** | **two** | **twoSeventy**}}

Syntax Description		
	24ghz	Specifies the 2.4 GHz band.
	5ghz	Specifies the 5 GHz band.
	multicast-direct	Specifies CAC parameters for multicast-direct media streams.
	max-retry-percent	Specifies the percentage of maximum retries that are allowed for multicast-direct media streams.
	retryPercent	Percentage of maximum retries that are allowed for multicast-direct media streams. **Note** The range is from 0 to 100.
	min-client-rate	Specifies the minimum transmission data rate to the client for multicast-direct media streams (rate at which the client must transmit in order to receive multicast-direct unicast streams). If the transmission rate is below this rate, either the video will not start or the client may be classified as a bad client. The bad client video can be demoted for better effort QoS or subject to denial.

min-client-rate	You can choose the following rates:	
	• **eighteen**	
	• **eleven**	
	• **fiftyFour**	
	• **fivePointFive**	
	• **fortyEight**	
	• **nine**	
	• **one**	
	• **oneFifty**	
	• **oneFortyFourPointFour**	
	• **oneThirty**	
	• **oneThirtyFive**	
	• **seventyTwoPointTwo**	
	• **six**	
	• **sixtyFive**	
	• **thirtySix**	
	• **threeHundred**	
	• **twelve**	
	• **twentyFour**	
	• **two**	
	• **twoSeventy**	

Command Default The default value for the maximum retry percent is 80. If it exceeds 80, either the video will not start or the client might be classified as a bad client. The bad client video will be demoted for better effort QoS or is subject to denial.

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines CAC commands require that the WLAN you are planning to modify is configured for the Wi-Fi Multimedia (WMM) protocol.

Before you can configure CAC parameters on a network, you must complete the following prerequisites:

 • Disable all WLANs with WMM enabled by entering the **wlan** *wlan_name* **shutdown** command.

- Disable the radio network you want to configure by entering the **ap dot11** {**24ghz** | **5ghz**} **shutdown** command.

- Save the new configuration.

- Enable voice or video CAC for the network you want to configure by entering the **ap dot11** {**24ghz** | **5ghz**} **cac voice acm** or **ap dot11** {**24ghz** | **5ghz**} **cac video acm** commands.

This example shows how to configure the maximum retry percent for multicast-direct media streams as 90 on a 802.11a network:

```
Device(config)# ap dot11 5ghz cac media-stream multicast max-retry-percent 90
```

ap dot11 cac multimedia

To configure multimedia Call Admission Control (CAC) voice and video quality parameters for 2.4 GHz and 5 GHz bands, use the **ap dot11 cac multimedia** command.

ap dot11 {**24ghz** | **5ghz**} **cac multimedia max-bandwidth** *bandwidth*

Syntax Description	**24ghz**	Specifies the 2.4 GHz band.
	5ghz	Specifies the 5 GHz band.
	max-bandwidth	Specifies the percentage of maximum bandwidth allocated to Wi-Fi Multimedia (WMM) clients for voice and video applications on the 2.4 GHz or 5 GHz band.
	bandwidth	Percentage of the maximum bandwidth allocated to WMM clients for voice and video applications on the 802.11a or 802.11b/g network. Once the client reaches the specified value, the access point rejects new multimedia flows this radio band. The range is from 5 to 85%.

Command Default   The default value is 75%.

Command Modes   Global configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   CAC commands require that the WLAN you are planning to modify is configured for the Wi-Fi Multimedia (WMM) protocol.

Before you can configure CAC parameters on a network, you must complete the following prerequisites:

   • Disable all WLANs with WMM enabled by entering the **wlan** *wlan_name* **shutdown** command.

   • Disable the radio network you want to configure by entering the **ap dot11** {**24ghz | 5ghz**} **shutdown** command.

   • Save the new configuration.

   • Enable voice or video CAC for the network you want to configure by entering the **ap dot11** {**24ghz | 5ghz**} **cac voice acm** or **ap dot11** {**24ghz | 5ghz**} **cac video acm** commands.

This example shows how to configure the percentage of the maximum bandwidth allocated to WMM clients for voice and video applications on the 5 GHz band:

```
Device(config)# ap dot11 5ghz cac multimedia max-bandwidth 5
```

ap dot11 cac voice

To configure Call Admission Control (CAC) parameters for the voice category, use the **ap dot11 cac voice** command.

ap dot11 {**24ghz** | **5ghz**} **cac voice** {**acm** | **load-based** | **max-bandwidth** *value* | **roam-bandwidth** *value* | **sip** [**bandwidth** *bw*] **sample-interval** *value* | **stream-size** *x* **max-streams** *y* | **tspec-inactivity-timeout** {**enable** | **ignore**}}

Syntax Description		
24ghz	Specifies the 2.4 GHz band.	
5ghz	Specifies the 5 GHz band.	
acm	Enables bandwidth-based voice CAC for the 2.4 GHz or 5 GHz band.	
	Note	To disable bandwidth-based voice CAC for the 2.4 GHz or 5 GHz band, use the **no ap dot11** {**24ghz**	**5ghz**} **cac voice acm** command.
load-based	Enable load-based CAC on voice access category.	
	Note	To disable load-based CAC on voice access category for the 2.4 GHz or 5 GHz band, use the **no ap dot11** {**24ghz**	**5ghz**} **cac voice load-based** command.
max-bandwidth	Sets the percentage of the maximum bandwidth allocated to clients for voice applications on the 2.4 GHz or 5 GHz band.	
value	Bandwidth percentage value from 5 to 85%.	
roam-bandwidth	Sets the percentage of the CAC maximum allocated bandwidth reserved for roaming voice clients on the 2.4 GHz or 5 GHz band.	
value	Bandwidth percentage value from 0 to 85%.	
sip	Specifies the CAC codec name and sample interval as parameters and calculates the required bandwidth per call for the 802.11 networks.	
bandwidth	(Optional) Specifies bandwidth for a SIP-based call.	

bw	Bandwidth in kbps. The following bandwidth values specify parameters for the SIP codecs: • 64kbps—Specifies CAC parameters for the SIP G711 codec. • 8kbps—Specifies CAC parameters for the SIP G729 codec. **Note** The default value is 64 Kbps.
sample-interval	Specifies the packetization interval for SIP codec.
value	Packetization interval in msecs. The sample interval for SIP codec value is 20 seconds.
stream-size	Specifies the number of aggregated voice Wi-Fi Multimedia (WMM) traffic specification (TSPEC) streams at a specified data rate for the 2.4 GHz or 5 GHz band.
x	Stream size. The range of the stream size is from 84000 to 92100.
max-streams	Specifies the maximum number of streams per TSPEC.
y	Number (1 to 5) of voice streams. **Note** The default number of streams is 2 and the mean data rate of a stream is 84 kbps.
tspec-inactivity-timeout	Specifies TSPEC inactivity timeout processing mode. **Note** Use this keyword to process or ignore the Wi-Fi Multimedia (WMM) traffic specifications (TSPEC) inactivity timeout received from an access point. When the inactivity timeout is ignored, a client TSPEC is not deleted even if the access point reports an inactivity timeout for that client.
enable	Processes the TSPEC inactivity timeout messages.
ignore	Ignores the TSPEC inactivity timeout messages. **Note** The default is **ignore** (disabled).

Command Default   None

Command Modes   Global configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   CAC commands require that the WLAN you are planning to modify is configured for the Wi-Fi Multimedia (WMM) protocol and the quality of service (QoS) level be set to Platinum.

Before you can configure CAC parameters on a network, you must complete the following prerequisites:

- Disable all WLANs with WMM enabled by entering the **wlan** *wlan_name* **shutdown** command.

- Disable the radio network you want to configure by entering the **ap dot11** {**24ghz** | **5ghz**} **shutdown** command.

- Save the new configuration.

- Enable voice or video CAC for the network you want to configure by entering the **ap dot11** {**24ghz** | **5ghz**} **cac voice acm** or **ap dot11** {**24ghz** | **5ghz**} **cac video acm** commands.

This example shows how to enable the bandwidth-based CAC:

```
Device(config)# ap dot11 24ghz cac voice acm
```

This example shows how to enable the load-based CAC on the voice access category:

```
Device(config)# ap dot11 24ghz cac voice load-based
```

This example shows how to specify the percentage of the maximum allocated bandwidth for voice applications on the selected radio band:

```
Device(config)# ap dot11 24ghz cac voice max-bandwidth 50
```

This example shows how to configure the percentage of the maximum allocated bandwidth reserved for roaming voice clients on the selected radio band:

```
Device(config)# ap dot11 24ghz cac voice roam-bandwidth 10
```

This example shows how to configure the bandwidth and voice packetization interval for the G729 SIP codec on a 2.4 GHz band:

```
Device(config)# ap dot11 24ghz cac voice sip bandwidth 8 sample-interval 40
```

This example shows how to configure the number of aggregated voice traffic specifications stream with a stream size of 85000 and with a maximum of 5 streams:

```
Device(config)# ap dot11 24ghz cac voice stream-size 85000 max-streams 5
```

This example shows how to enable the voice TSPEC inactivity timeout messages received from an access point:

```
Device(config)# ap dot11 24ghz cac voice tspec-inactivity-timeout enable
```

ap dot11 cleanair

To configure CleanAir on 802.11 networks, use the **ap dot11 cleanair** command. To disable CleanAir on 802.11 networks, use the **no** form of this command.

ap dot11 {**24ghz** | **5ghz**} **cleanair**
no ap dot11 {**24ghz** | **5ghz**} **cleanair**

Syntax Description	**24ghz**	Specifies the 2.4 GHz band.
	5ghz	Specifies the 5 GHz band.
	cleanair	Specifies CleanAir on the 2.4 GHz or 5 GHz band.

Command Default   Disabled

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to enable the CleanAir settings on the 2.4 GHz band:

```
Device(config)# ap dot11 24ghz cleanair
```

ap dot11 cleanair alarm air-quality

To configure the CleanAir alarm for air quality in the 2.4-GHz or 5-GHz radios, use the **ap dot11** {**24ghz** | **5ghz**} **cleanair alarm air-quality**

ap dot11 { **24ghz** | **5ghz** } **cleanair alarm air-quality**

Syntax Description	This command has no keywords or arguments.

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

This example shows how to configure the CleanAir alarm for air quality in the 2.4-GHz or 5-GHz radios:

```
Device(config)# ap dot11 24ghz cleanair alarm air-quality
```

ap dot11 cleanair alarm air-quality threshold

To configure the air quality alarm threshold for the 2.4-GHz or 5-GHz radios, use the **ap dot11** {**24ghz** | **5ghz**} **cleanair alarm air-quality threshold**

ap dot11 { **24ghz** | **5ghz** } **cleanair alarm air-quality threshold** *threshold-value*

Syntax Description

threshold-value	Specifies the air quality alarm threshold value. The value range is from 1 to 100.

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

This example shows how to configure the air quality alarm threshold for the 2.4-GHz or 5-GHz radios:

```
Device(config)# ap dot11 24ghz cleanair alarm air-quality threshold 25
```

ap dot11 cleanair alarm device cont-tx

To configure the continuous transmitter as the interference device CleanAir alarm in the 2.4-GHz or 5-GHz radios, use the **ap dot11** {**24ghz** | **5ghz**} **cleanair alarm device cont-tx**

ap dot11 { **24ghz** | **5ghz** } **cleanair alarm device cont-tx**

Syntax Description	This command has no keywords or arguments.

Command Default	None

Command Modes	Global Configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

This example shows how to configure the continuous transmitter as the interference device CleanAir alarm in the 2.4-GHz or 5-GHz radios:

```
Device(config)# ap dot11 24ghz cleanair alarm device cont-tx
```

ap dot11 cleanair alarm unclassified

To configure air quality alarm on exceeding unclassified category severity in the 2.4-GHz and 5-GHz radios, use the **ap dot11** {**24ghz** | **5ghz**} **cleanair alarm unclassified**

ap dot11 { **24ghz** | **5ghz** } **cleanair alarm unclassified**

Syntax Description	This command has no keywords or arguments.

Command Default None

Command Modes Global Configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

This example shows how to configure air quality alarm on exceeding unclassified category severity in the 2.4-GHz and 5-GHz radios:

```
Device(config)# ap dot11 24ghz cleanair alarm unclassified
```

ap dot11 cleanair alarm unclassified threshold

To configure air quality alarm on exceeding unclassified category severity in the 2.4-GHz and 5-GHz radios, use the **ap dot11** {**24ghz** | **5ghz**} **cleanair alarm unclassified threshold**

ap dot11 { **24ghz** | **5ghz** } **cleanair alarm unclassified threshold** *threshold-value*

Syntax Description	*threshold-value* Specifies the air quality alarm on exceeding unclassified threshold value. The value range is from 1 to 100, where 1 is low interference and 100 is high interference.

Command Default　None

Command Modes　Global Configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

This example shows how to configure air quality alarm on exceeding unclassified category severity in the 2.4-GHz and 5-GHz radios:

```
Device(config)# ap dot11 24ghz cleanair alarm unclassified threshold 20
```

ap dot11 cleanair device

To configure CleanAir interference device types, use the **ap dot11 cleanair device** command.

ap dot11 24ghz cleanair device [**all** | **bt-discovery** | **bt-link** | **canopy** | **cont-tx** | **dect-like** | **fh** | **inv** | **jammer** | **mw-oven** | **nonstd** | **superag** | **tdd-tx** | **video** | **wimax-fixed** | **wimax-mobile** | **xbox** | **zigbee**]

Syntax Description		
all		Specifies all device types.
device		Specifies the CleanAir interference device type.
bt-discovery		Specifies the Bluetooth device in discovery mode.
bt-link		Specifies the Bluetooth active link.
canopy		Specifies the Canopy devices.
cont-tx		Specifies the continuous transmitter.
dect-like		Specifies a Digital Enhanced Cordless Communication (DECT)-like phone.
fh		Specifies the 802.11 frequency hopping devices.
inv		Specifies the devices using spectrally inverted Wi-Fi signals.
jammer		Specifies the jammer.
mw-oven		Specifies the microwave oven devices.
nonstd		Specifies the devices using nonstandard Wi-Fi channels.
superag		Specifies 802.11 SuperAG devices.
tdd-tx		Specifies the TDD transmitter.
video		Specifies video cameras.
wimax-fixed		Specifies a WiMax fixed device.
wimax-mobile		Specifies a WiMax mobile device.
xbox		Configures the alarm for Xbox interference devices.
zigbee		Configures the alarm for 802.15.4 interference devices.

Command Default   None

Command Modes   Global configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure the device to monitor ZigBee interferences:

```
Device(config)# ap dot11 24ghz cleanair device report
```

ap dot11 dot11n

To configure settings for an 802.11n network, use the **ap dot11 dot11n** command.

ap dot11 {**24ghz** | **5ghz**} **dot11n** {**a-mpdu tx priority** {*priority_value* **all** } | **scheduler timeout rt** *scheduler_value* } | **a-msdu tx priority** {*priority_value* | **all**} | **guard-interval** {**any** | **long**} | **mcs tx** *rate* | **rifs rx**}

Syntax Description		
24ghz	Specifies the 2.4-GHz band.	
5ghz	Specifies the 5-GHz band.	
dot11n	Enables 802.11n support.	
a-mpdu tx priority	Specifies the traffic that is associated with the priority level that uses Aggregated MAC Protocol Data Unit (A-MPDU) transmission.	
priority_value	Aggregated MAC protocol data unit priority level from 0 to 7.	
all	Specifies all of the priority levels at once.	
a-msdu tx priority	Specifies the traffic that is associated with the priority level that uses Aggregated MAC Service Data Unit (A-MSDU) transmission.	
priority_value	Aggregated MAC protocol data unit priority level from 0 to 7.	
all	Specifies all of the priority levels at once.	
scheduler timeout rt	Configures the 802.11n A-MPDU transmit aggregation scheduler timeout value in milliseconds.	
scheduler_value	The 802.11n A-MPDU transmit aggregation scheduler timeout value from 1 to 10000 milliseconds.	
guard-interval	Specifies the guard interval.	
any	Enables either a short or a long guard interval.	
long	Enables only a long guard interval.	
mcs tx *rate*	Specifies the modulation and coding scheme (MCS) rates at which data can be transmitted between the access point and the client.	
rate	Specifies the modulation and coding scheme data rates. **Note** The range is from 0 to 23.	

rifs rx	Specifies the Reduced Interframe Space (RIFS) between data frames.

Command Default   By default, priority 0 is enabled.

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   Aggregation is the process of grouping packet data frames together rather than transmitting them separately. The two aggregation methods available are:

- A-MPDU—This aggregation is performed in the software.
- A-MSDU—This aggregation is performed in the hardware

Aggregated MAC Protocol Data Unit priority levels assigned per traffic type are as follows:

- 0—Best effort

- 1—Background

- 2—Spare

- 3—Excellent effort

- 4—Controlled load

- 5—Video, less than 100-ms latency and jitter

- 6—Voice, less than 10-ms latency and jitter

- 7—Network control

- all—Configure all of the priority levels at once.

Note   Configure the priority levels to match the aggregation method used by the clients.

This example shows how to enable 802.11n support on a 2.4-GHz band:

```
Device(config)# ap dot11 24ghz dot11n
```

This example shows how to configure all the priority levels at once so that the traffic that is associated with the priority level uses A-MSDU transmission:

```
Device(config)# ap dot11 24ghz dot11n a-msdu tx priority all
```

This example shows how to enable only long guard intervals:

```
Device(config)# ap dot11 24ghz dot11n guard-interval long
```

This example shows how to specify MCS rates:

```
Device(config)# ap dot11 24ghz dot11n mcs tx 5
```

This example shows how to enable RIFS:

```
Device(config)# ap dot11 24ghz dot11n rifs rx
```

ap dot11 dtpc

To configure Dynamic Transmit Power Control (DTPC) settings, Cisco Client eXtension (CCX) version 5 expedited bandwidth request feature, and the fragmentation threshold on an 802.11 network, use the **ap dot11 dtpc** command.

ap dot11 {**24ghz** | **5ghz**} {**dtpc** | **exp-bwreq** | **fragmentation** *threshold*}

Syntax Description		
24ghz	Specifies the 2.4 GHz band.	
5ghz	Specifies the 5 GHz band.	
dtpc	Specifies Dynamic Transport Power Control (DTPC) settings.	
	Note This option is enabled by default.	
exp-bwreq	Specifies Cisco Client eXtension (CCX) version 5 expedited bandwidth request feature.	
	Note The expedited bandwidth request feature is disabled by default.	
fragmentation *threshold*	Specifies the fragmentation threshold.	
	Note This option can only used be when the network is disabled using the **ap dot11** {**24ghz	5ghz**} **shutdown** command.	
threshold	Threshold. The range is from 256 to 2346 bytes (inclusive).	

Command Default None

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines When the CCX version 5 expedited bandwidth request feature is enabled, the device configures all joining access points for this feature.

This example shows how to enable DTPC for the 5 GHz band:

```
Device(config)# ap dot11 5ghz dtpc
```

This example shows how to enable the CCX expedited bandwidth settings:

```
Device(config)# ap dot11 5ghz exp-bwrep
```

This example shows how to configure the fragmentation threshold on the 5 GHz band with the threshold number of 1500 bytes:

```
Device(config)# ap dot11 5ghz fragmentation 1500
```

ap dot11 edca-parameters

To enable a specific enhanced distributed channel access (EDCA) profile on the 2.4 GHz or 5 GHz bands, use the **ap dot11 edca-parameters** command. To disable an EDCA profile on the 2.4 GHz or 5 GHz bands, use the **no** form of this command.

ap dot11 { **24ghz** | **5ghz** } **edca-parameters** { **client-load-based** | **custom-voice** | **optimized-video-voice** | **optimized-voice** | **svp-voice** | **wmm-default** }
no ap dot11 { **24ghz** | **5ghz** } **edca-parameters** { **client-load-based** | **custom-voice** | **fastlane** | **optimized-video-voice** | **optimized-voice** | **svp-voice** | **wmm-default** }

Syntax Description		
	24ghz	Specifies the 2.4 GHz band.
	5ghz	Specifies the 5 GHz band.
	edca-parameters	Specifies a specific enhanced distributed channel access (EDCA) profile on the 802.11 networks.
	fastlane	Enables Fastlane parameters for 24GHz.
	client-load-based	Enables client load-based EDCA configuration for 802.11 radios.
	custom-voice	Enables custom voice EDCA parameters.
	optimized-video-voice	Enables EDCA voice- and video-optimized profile parameters. Choose this option when both voice and video services are deployed on your network.
	optimized-voice	Enables EDCA voice-optimized profile parameters. Choose this option when voice services other than SpectraLink are deployed on your network.
	svp-voice	Enables SpectraLink voice priority parameters. Choose this option if SpectraLink phones are deployed on your network to improve the quality of calls.
	wmm-default	Enables the Wi-Fi Multimedia (WMM) default parameters. Choose this option when voice or video services are not deployed on your network.

Command Default	**wmm-default**

Command Modes	Global configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
	10.3	The **custom-voice** keyword was removed for Cisco 5700 Series WLC.
	Cisco IOS XE Bengaluru 17.5.1	The **client-load-based** keyword was added.

This example shows how to enable SpectraLink voice priority parameters:

```
Device(config)# ap dot11 24ghz edca-parameters svp-voice
```

ap dot11 load-balancing denial

To configure the load balancing denial count, use the **ap dot11 load-balancingdenial**command. To disable load balancing denial count, use the **no** form of the command.

ap dot11 {**24ghz** | **5ghz**} **load-balancingdenial** *count*

Syntax Description		
	count	Load balancing denial count.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure the load balancing denial count:

```
Device# configure terminal
Device(config)# ap dot11 5ghz load-balancing denial 10
```

ap dot11 load-balancing window

To configure the number of clients for the aggressive load balancing client window, use the **ap dot11 load-balancingwindow**command. To disable the client count, use the **no** form of the command.

ap dot11 {**24ghz**|**5ghz**}**load-balancingwindow** *clients*

Syntax Description	*clients* Number of clients. Valid range is from 0 to 20.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure the number of clients for the aggressive load balancing client window:

```
Device# configure terminal
Device(config)# ap dot11 5ghz load-balancing window 10
```

ap dot11 rf-profile

To configure an RF-Profile for a selected band, use the **ap dot11 rf-profile** command. To delete an RF-Profile, use the **no** form of this command.

ap dot11 { **24ghz** | **5ghz** | **6ghz** } **rf-profile** *profile name*

Syntax Description		
	24ghz	Displays the 2.4-GHz band
	5ghz	Displays the 5-GHz band
	6ghz	Displays the 6-GHz band
	profile name	Name of the RF profile

Command Default None

Command Modes Global configuration (config)

Command History	Release	Modification
	Cisco IOS XE Denali 16.3.1	This command was introduced.
		6-GHz band was introduced in Cisco IOS XE Cupertino 17.7.1.

Usage Guidelines None

This example shows how to configure an RF profile for a selected band.

```
Device#ap dot11 24GHz rf-profile doctest
```

ap dot11 rrm

To configure basic and advanced radio resource management settings for 802.11 devices, use the **ap dot11 rrm** command.

ap dot11 {**24ghz** | **5ghz**} **rrm** {**ccx location-measurement** *sec* | **channel** {**cleanair-event** | **dca** | **device** | **foreign** | **load** | **noise** | **outdoor-ap-dca**} | **coverage** {**data fail-percentage** *pct* | **data packet-count** *count* | **data rssi-threshold** *threshold*} | **exception global** *percentage* | **level global** *number* | **voice** {**fail-percentage** *percentage* | **packet-count** *number* | **rssi-threshold** *threshold*}}

Syntax Description	ccx	Configures Advanced (RRM) 802.11 CCX options.
	location-measurement	Specifies 802.11 CCX Client Location Measurements in seconds. The range is between 10 and 32400 seconds.
	channel	Configure advanced 802.11-channel assignment parameters.
	cleanair-event	Configures cleanair event-driven RRM parameters.
	dca	Configures 802.11-dynamic channel assignment algorithm parameters.
	device	Configures persistent non-WiFi device avoidance in the 802.11-channel assignment.
	foreign	Enables foreign AP 802.11-interference avoidance in the channel assignment.
	load	Enables Cisco AP 802.11-load avoidance in the channel assignment.
	noise	Enables non-802.11-noise avoidance in the channel assignment.
	outdoor-ap-dca	Configures 802.11 DCA list option for outdoor AP.
	coverage	Configures 802.11 coverage Hole-Detection.

data fail-percentage *pct*	Configures 802.11 coverage failure-rate threshold for uplink data packets. The range is between 1 and 100
data packet-count *count*	Configures 802.11 coverage minimum-failure-count threshold for uplinkdata packets.
data rssi-threshold *threshold*	Configures 802.11 minimum-receive-coverage level for voice packets.
exception global *percentage*	Configures 802.11 Cisco APs coverage-exception level. The range is between 0 and 100 percent.
level global *number*	Configures 802.11 Cisco AP client-minimum-exception level between 1 and 75 clients.
voice	Configures 802.11 coverage Hole-Detection for voice packets.
fail-percentage *percentage*	Configures 802.11 coverage failure rate threshold for uplink voice packets.
packet-count *number*	Configures 802.11 coverage minimum-uplink-failure count threshold for voice packets.
rssi-threshold *threshold*	Configures 802.11 minimum receive coverage level for voice packets.

Command Default   Disabled

Command Modes   Interface configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   This command applies for both 802.11a and 802.11b bands. But the appropriate commands must be chosen for configuring the parameter.

This example shows how to configure various RRM settings.

```
Device#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)#ap dot11 5ghz rrm ?
```

```
ccx            Configure Advanced(RRM) 802.11a CCX options
channel        Configure advanced 802.11a channel assignment parameters
coverage       802.11a Coverage Hole Detection
group-member   Configure members in 802.11a static RF group
group-mode     802.11a RF group selection mode
logging        802.11a event logging
monitor        802.11a statistics monitoring
ndp-type       Neighbor discovery type Protected/Transparent
profile        802.11a performance profile
tpc-threshold  Configures the Tx Power Control Threshold used by RRM for auto
               power assignment
txpower        Configures the 802.11a Tx Power Level
```

ap dot11 rrm channel

To enable radio resource management channel for 2.4 GHz and 5GHz devices, use the **ap dot11 rrm channel** command. To disable the radio resource mangement for 2.4 GHz and 5 GHz devices, use the **no** form of the command.

ap dot11 {24ghz | 5ghz} rrm channel {cleanair-event | dca | device | foreign | load | noise}
no ap dot11 {24ghz | 5ghz} rrm channel {cleanair-event | dca | device | foreign | load | noise}

Syntax Description	**cleanair-event**	Specifies the cleanair event-driven RRM parameters
	dca	Specifies the 802.11 dynamic channel assignment algorithm parameters
	device	Specifies the persistent non-WiFi device avoidance in the 802.11-channel assignment.
	foreign	Enables foreign AP 802.11-interference avoidance in the channel assignment.
	load	Enables Cisco AP 802.11-load avoidance in the channel assignment.
	noise	Enables non-802.11-noise avoidance in the channel assignment.

Command Default   None.

Command Modes   Interface configuration.

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   None.

This example shows all the parameters available for **Channel**.

```
Device#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)#ap dot11 24ghz rrm channel ?
  cleanair-event  Configure cleanair event-driven RRM parameters
  dca             Config 802.11b dynamic channel assignment algorithm
                  parameters
  device          Configure persistent non-WiFi device avoidance in the 802.11b
                  channel assignment
  foreign         Configure foreign AP 802.11b interference avoidance in the
                  channel assignment
  load            Configure Cisco AP 802.11b load avoidance in the channel
                  assignment
  noise           Configure 802.11b noise avoidance in the channel assignment
```

ap dot11 rrm channel cleanair-event

To configure CleanAir event-driven Radio Resource Management (RRM) parameters for all 802.11 Cisco lightweight access points, use the **ap dot11 rrm channel cleanair-event** command. When this parameter is configured, CleanAir access points can change their channel when a source of interference degrades the operations, even if the RRM interval has not expired yet.

ap dot11 {**24ghz** | **5ghz**} **rrm channel** {**cleanair-event sensitivity** *value*}

Syntax Description		
24ghz	Specifies the 2.4 GHz band.	
5ghz	Specifies the 5 GHz band.	
sensitivity	Sets the sensitivity for CleanAir event-driven RRM.	
value	Sensitivity value. You can specify any one of the following three optional sensitivity values:	
	• **low**—Specifies low sensitivity.	
	• **medium**—Specifies medium sensitivity.	
	• **high**—Specifies high sensitivity.	

Command Default None

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to set the high sensitivity for CleanAir event-driven RRM:

Device(config)# **ap dot11 24ghz rrm channel cleanair-event sensitivity high**

ap dot11 rrm channel dca

To configure Dynamic Channel Assignment (DCA) algorithm parameters on 802.11 networks, use the **ap dot11 rrm channel dca** command.

ap dot11 {**24ghz** | **5ghz**} **rrm channel dca** {*channel_number* | **anchor-time** *value* | **global** {**auto** | **once**} | **interval** *value* | **min-metric** *value* | **sensitivity** {**high** | **low** | **medium**}}

Syntax Description		
24ghz	Specifies the 2.4 GHz band.	
5ghz	Specifies the 5 GHz band.	
channel_number	Channel number to be added to the DCA list. **Note** The range is from 1 to 14.	
anchor-time	Specifies the anchor time for DCA.	
value	Hour of time between 0 and 23. These values represent the hour from 12:00 a.m. to 11:00 p.m.	
global	Specifies the global DCA mode for the access points in the 802.11 networks.	
auto	Enables auto-RF.	
once	Enables one-time auto-RF.	
interval	Specifies how often the DCA is allowed to run.	
value	Interval between the times when DCA is allowed to run. Valid values are 0, 1, 2, 3, 4, 6, 8, 12, or 24 hours. 0 is 10 minutes (600 seconds). Default value is 0 (10 minutes).	
min-metric	Specifies the DCA minimum RSSI energy metric.	
value	Minimum RSSI energy metric value from –100 to –60.	
sensitivity	Specifies how sensitive the DCA algorithm is to environmental changes (for example, signal, load, noise, and interference) when determining whether or not to change channels.	
high	Specifies that the DCA algorithm is not particularly sensitive to environmental changes. See the "Usage Guidelines" section for more information.	
low	Specifies that the DCA algorithm is moderately sensitive to environmental changes. See the "Usage Guidelines" section for more information.	
medium	Specifies that the DCA algorithm is highly sensitive to environmental changes. See the "Usage Guidelines" section for more information.	

Command Default   None

Command Modes   Global configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines	The DCA sensitivity thresholds vary by radio band as shown in the table below.

To aid in troubleshooting, the output of this command shows an error code for any failed calls. The table below explains the possible error codes for failed calls.

Table 6: DCA Sensitivity Threshold

Sensitivity	**2.4 Ghz DCA Sensitivity Threshold**	**5 Ghz DCA Sensitivity Threshold**
High	5 dB	5 dB
Medium	15 dB	20 dB
Low	30 dB	35 dB

This example shows how to configure the device to start running DCA at 5 pm for the 2.4 GHz band:

```
Device(config)# ap dot11 24ghz rrm channel dca anchor-time 17
```

This example shows how to set the DCA algorithm to run every 10 minutes for the 2.4 GHz band:

```
Device(config)# ap dot11 24ghz rrm channel dca interval 0
```

This example shows how to configure the value of DCA algorithm's sensitivity to low on the 2.4 GHz band:

```
Device(config)# ap dot11 24ghz rrm channel dca sensitivity low
```

ap dot11 rrm channel-update mesh

To initiate update of the 802.11a, 802.11b, and 802.11 6GHz channel selection for every mesh Cisco AP, use the **ap dot11** {**24ghz** | **5ghz** | **6ghz**} **rrm channel-update mesh**

AP

ap dot11 { **24ghz** | **5ghz** | **6ghz** } **rrm channel-update mesh**

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

The example shows how to initiate update of the 802.11a, 802.11b, and 802.11 6GHz channel selection for every mesh Cisco AP:

```
Device# ap dot11 5ghz rrm channel-update mesh
```

ap dot11 rrm channel-update mesh bridge-group

To initiate the update of the 802.11, 802.11a, or 802.11b channel selection for mesh AP in the bridge group, use the **ap dot11** {**24ghz** | **5ghz** | **6ghz**} **channel-update mesh bridge-group**

ap dot11 { **24ghz** | **5ghz** | **6ghz** } **rrm channel-update mesh channel-update mesh bridge-group** *bridge-group-name*

Syntax Description	*bridge-group-name*	Specifies the name of the bridge group.

Command Default None

Command Modes Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

This example shows how to initiate the update of the 802.11, 802.11a, or 802.11b channel selection for mesh AP in the bridge group:

```
Device# ap dot11 5ghz rrm channel-update mesh bridge-group cisco-bridge-group
```

ap dot11 rrm channel dca chan-width

To configure channel width for IEEE 802.11 radios, use the **ap dot11 rrm channel dca chan-width** command.

ap dot11 {**24ghz** | **5ghz**} **rrm channel dca chan-width** {**160** | **20** | **40** | **80** | **80+80** | **best** | **width-max**}

Syntax Description		
160	160 MHz.	
20	20 MHz.	
40	40 MHz.	
80	80 MHz.	
80+80	80+80 MHz.	
best	Best channel width.	
width-max	Maximum best channel width allowed for dynamic bandwidth selection.	

Command Default   None

Command Modes   Global Configuration (config)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines

Example

The following example shows how to configure channel width for IEEE 802.11 radios.

```
Device(config)# ap dot11 5ghz rrm channel dca chan-width 160
```

ap dot11 rrm coverage

To enable 802.11 coverage hole detection, use the **ap dot11 rrm coverage** command.

ap dot11 {**24ghz** | **5ghz**} **rrm coverage** [**data** {**fail-percentage** *percentage* | **packet-count** *count* | **rssi-threshold** *threshold*} | **exceptional global** *value* | **level global** *value* | **voice** {**fail-percentage** *percentage* | **packet-count** *packet-count* | **rssi-threshold** *threshold*}]

Syntax Description		
data	Specifies 802.11 coverage hole-detection data packets.
fail-percentage *percentage*	Specifies 802.11 coverage failure-rate threshold for uplink data packets. The range is between 1 and 100
packet-count *count*	Specifies 802.11 coverage minimum-failure-count threshold for uplink data packets.
rssi-threshold *threshold*	Specifies 802.11 minimum-receive-coverage level for voice packets.
exceptional global *value*	Specifies 802.11 Cisco APs coverage-exception level. The range is between 0 and 100 percent.
level global *value*	Specifies 802.11 Cisco AP client-minimum-exception level between 1 and 75 clients.
voice	Specifies 802.11 coverage Hole-Detection for voice packets.
fail-percentage *percentage*	Specifies 802.11 coverage failure rate threshold for uplink voice packets.
packet-count *packet-count*	Specifies 802.11 coverage minimum-uplink-failure count threshold for voice packets.
rssi-threshold *threshold*	Specifies 802.11 minimum receive coverage level for voice packets.

Command Default	None.

Command Modes	Interface configuration.

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   If you enable coverage hole-detection, the device automatically determines, based on data that is received from the access points, whether any access points have clients that are potentially located in areas with poor coverage.

If both the number and percentage of failed packets exceed the values that you entered in the **ap dot11 {24ghz | 5ghz} rrm coverage packet-count** and **ap dot11 {24ghz | 5ghz} rrm coverage fail-percentage** commands for a 5-second period, the client is considered to be in a pre-alarm condition. The device uses this information to distinguish between real and false coverage holes and excludes clients with poor roaming logic. A coverage hole is detected if both the number and percentage of failed clients meet or exceed the values entered in the

ap dot11 {24ghz | 5ghz} rrm coverage level-global and **ap dot11 {24ghz | 5ghz} rrm coverage exceptional-global** commands over a 90-second period. The device determines whether the coverage hole can be corrected and, if appropriate, mitigate the coverage hole by increasing the transmit power level for that specific access point.

This example shows how to set the RSSI-threshold for data in 5-GHz band.

```
Device#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)#ap dot11 5ghz rrm coverage data rssi-threshold -80
```

ap dot11 rrm group-member

To configure members in an 802.11 static RF group, use the **ap dot11 rrm group-member** command. To remove members from 802.11 RF group, use the **no** form of this command.

ap dot11 {**24ghz** | **5ghz**} **rrm group-member** *controller-name controller-ip*
no ap dot11 {**24ghz** | **5ghz**} **rrm group-member** *controller-name controller-ip*

Syntax Description		
	24ghz	Specifies the 2.4 GHz band.
	5ghz	Specifies the 5 GHz band.
	controller-name	Name of the device to be added.
	controller-ip	IP address of the device to be added.

Command Default   None

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to add a device in the 5 GHz band RF group:

```
Device(config)# ap dot11 5ghz rrm group-member cisco-controller 192.0.2.54
```

ap dot11 rrm group-mode

To set the 802.11 automatic RF group selection mode on, use the **ap dot11 rrm group-mode** command. To set the 802.11 automatic RF group selection mode off, use the **no** form of this command.

ap dot11 { **5ghz** | **24ghz** | **6ghz** } **rrm group-mode** { **auto** | **leader** | **off** | **restart** }
no ap dot11 {**5ghz** | **24ghz**} **rrm group-mode**

Syntax Description		
5ghz	Specifies the 2.4-GHz band.
24ghz	Specifies the 5-GHz band.
6ghz	Specifies the 6-GHz band.
auto	Sets the 802.11 RF group selection to automatic update mode.
leader	Sets the 802.11 RF group selection to static mode, and sets this device as the group leader.
off	Sets the 802.11 RF group selection to off.
restart	Restarts the 802.11 RF group selection.

Command Default auto

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
Cisco IOS XE Cupertino 17.7.1	This command was modified to include the 6-GHz band.

This example shows how to turn the auto RF group selection mode on the 5 GHz band:

```
Device(config)# ap dot11 5ghz rrm group-mode auto
```

ap dot11 rrm logging

To configure report log settings on supported 802.11 networks, use the **ap dot11 rrm logging** command.

ap dot11 {**24ghz** | **5ghz**} **rrm logging** {**channel** | **coverage** | **foreign** | **load** | **noise** | **performance** | **txpower**}

Syntax Description		
	24ghz	Specifies the 2.4 GHz band.
	5ghz	Specifies the 5 GHz band.
	channel	Turns the channel change logging mode on or off. The default mode is off (Disabled).
	coverage	Turns the coverage profile logging mode on or off. The default mode is off (Disabled).
	foreign	Turns the foreign interference profile logging mode on or off. The default mode is off (Disabled).
	load	Turns the load profile logging mode on or off. The default mode is off (Disabled).
	noise	Turns the noise profile logging mode on or off. The default mode is off (Disabled).
	performance	Turns the performance profile logging mode on or off. The default mode is off (Disabled).
	txpower	Turns the transit power change logging mode on or off. The default mode is off (Disabled).

Command Default Disabled

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to turn the 5 GHz logging channel selection mode on:

```
Device(config)# ap dot11 5ghz rrm logging channel
```

This example shows how to turn the 5 GHz coverage profile violation logging selection mode on:

```
Device(config)# ap dot11 5ghz rrm logging coverage
```

This example shows how to turn the 5 GHz foreign interference profile violation logging selection mode on:

```
Device(config)# ap dot11 5ghz rrm logging foreign
```

This example shows how to turn the 5 GHz load profile logging mode on:

```
Device(config)# ap dot11 5ghz rrm logging load
```

This example shows how to turn the 5 GHz noise profile logging mode on:

```
Device(config)# ap dot11 5ghz rrm logging noise
```

This example shows how to turn the 5 GHz performance profile logging mode on:

```
Device(config)# ap dot11 5ghz rrm logging performance
```

This example shows how to turn the 5 GHz transmit power change mode on:

```
Device(config)# ap dot11 5ghz rrm logging txpower
```

ap dot11 rrm monitor

To Configure monitor settings on the 802.11 networks, use the **ap dot11 rrm monitor** command.

ap dot11 {**24ghz** | **5ghz**} **rrm monitor** {**channel-list** | {**all** | **country** | **dca**} | **coverage** | **load** | **noise** | **signal**} *seconds*

Syntax Description	24ghz	Specifies the 802.11b parameters.
	5ghz	Specifies the 802.11a parameters.
	channel-list all	Monitors the noise, interference, and rogue monitoring channel list for all channels.
	channel-list country	Monitors the noise, interference, and rogue monitoring channel list for the channels used in the configured country code.
	channel-list dca	Monitors the noise, interference, and rogue monitoring channel list for the channels used by automatic channel assignment.
	coverage	Specifies the coverage measurement interval.
	load	Specifies the load measurement interval.
	noise	Specifies the noise measurement interval.
	signal	Specifies the signal measurement interval.
	rssi-normalization	Configure RRM Neighbor Discovery RSSI Normalization.
	seconds	Measurement interval time from 60 to 3600 seconds.

Command Default	None

Command Modes	Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to monitor the channels used in the configured country:

```
Device(config)# ap dot11 24ghz rrm monitor channel-list country
```

This example shows how to set the coverage measurement interval to 60 seconds:

```
Device(config)# ap dot11 24ghz rrm monitor coverage 60
```

ap dot11 rrm ndp-type

To configure the 802.11 access point radio resource management neighbor discovery protocol type, use the **ap dot11 rrm ndp-type** command.

ap dot11 { **24ghz** | **5ghz** | **6ghz** } **rrm ndp-type** { **protected** | **transparent** }

Syntax Description		
24ghz	Specifies the 2.4-GHz band.
5ghz	Specifies the 5-GHz band.
6ghz	Specifies the 6-GHz band.
protected	Specifies the Tx RRM protected (encrypted) neighbor discovery protocol.
transparent	Specifies the Tx RRM transparent (not encrypted) neighbor discovery protocol.

Command Default   None

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
Cisco IOS XE Cupertino 17.7.1	This command was modified with the introduction of the 6-GHz band.

Usage Guidelines   Before you configure the 802.11 access point RRM neighbor discovery protocol type, ensure that you have disabled the network by entering the **ap dot11** {**24ghz** | **5ghz** | **6ghz**} **shutdown** command.

This example shows how to enable the 802.11a access point RRM neighbor discovery protocol type as protected:

```
Device(config)# ap dot11 5ghz rrm ndp-type protected
```

ap dot11 rrm tpc-threshold

To configure the tx-power control threshold used by RRM for auto power assignment, use the **ap dot11 rrm tpc-threshold** command. To disable, use the **no** form of the command.

ap dot11 {**24ghz** | **5ghz**} **rrm tpc-threshold** *value*
no ap dot11 {**24ghz** | **5ghz**} **rrm tpc-threshold**

Syntax Description	*value* Specifies the power value. The range is between -80 and -50.

Command Default   None.

Command Modes   Interface configuration.

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   None.

This example shows how to configure the tx-power control threshold used by RRM for auto power assignment.

```
Device#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)#ap dot11 5ghz rrm tpc-threshold -60
```

ap dot11 rrm txpower

To configure the 802.11 tx-power level, use the **ap dot11 rrm txpower** command. To disable the 802.11 tx-power level, use the **no** form of the command.

ap dot11 {**24ghz** | **5ghz**} **rrm txpower** {**auto** | **max** *powerLevel* | **min** *powerLevel* | **once***power-level*}
noap dot11 {**24ghz** | **5ghz**} **rrm txpower** {**auto** | **max** *powerLevel* | **min** *powerLevel* | **once***power-level*}

Syntax Description	**auto**	Enables auto-RF.
	max *powerLevel*	Configures maximum auto-RF tx power. The range is between -10 to -30.
	min *powerLevel*	Configures minimum auto-RF tx power. The range is between -10 to -30.
	once	Enables one-time auto-RF.

Command Default   None.

Command Modes   Interface configuration.

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
		The **no** form of the command is introduced.

Usage Guidelines   None.

This example shows how to enables auto-RF once.

```
Device#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)#ap dot11 5ghz rrm txpower once
```

ap dot11 rrm txpower

To configure the 802.11 tx-power level, use the **ap dot11 rrm txpower** command. To disable the 802.11 tx-power level, use the **no** form of the command.

ap dot11 {**24ghz** | **5ghz**} **rrm txpower** {**auto** | **max** *powerLevel* | **min** *powerLevel* | **once***power-level*}
noap dot11 {**24ghz** | **5ghz**} **rrm txpower** {**auto** | **max** *powerLevel* | **min** *powerLevel* | **once***power-level*}

Syntax Description		
auto	Enables auto-RF.
max *powerLevel*	Configures maximum auto-RF tx power. The range is between -10 to -30.
min *powerLevel*	Configures minimum auto-RF tx power. The range is between -10 to -30.
once	Enables one-time auto-RF.

Command Default	None.

Command Modes	Interface configuration.

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
	The **no** form of the command is introduced.

Usage Guidelines None.

This example shows how to enables auto-RF once.

```
Device#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)#ap dot11 5ghz rrm txpower once
```

ap dot15 shutdown

To configure the global dot 15 radio parameters, use the **ap dot15 shutdown** command. To disable the configuration, use the no form of command.

ap dot15 shutdown

no ap dot15 shutdown

Syntax Description	**dot15**	Configures for global Dot15 radio parameters.
	shutdown	Disable Dot15 radio for all APs
		.

Command Default   None

Command Modes   Global Configuration mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows how to configure the global dot 15 radio parameters:

```
Device(config)# ap dot15 shutdown
```

ap filter

To configure the AP filter and set the priority, use the **ap filter** command.

ap filter { { **name** *filter-name* } **type** { **tag** } | { **priority** *priority-number* | **filter-name** *filter-name* } }

Syntax Description	Parameter	Description
	priority	Set the priority for a named filter.
	priority-number	The valid AP filter priority range is 0 to 1023.
	filter-name	Enter the name for the ap filter.
	type	Type of filter.
	tag	Filter to assign AP Tags. Tag filter may be persistent based on tag persistence on the global configuration.

Command Default	None

Command Modes	Global configuration (config)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to create a ap filter and set the priority to this filter:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap filter name test-filter
Device(config)# ap filter name test-filter type priming
Device(config)# ap filter priority 12 filter-name test-filter
```

ap fra

To configure flexible radio assignment (FRA) and its parameters, use the **ap fra** command.

ap fra[**interval** *no-of-hours* | **sensitivity** {**high** | **low** | **medium** } | **sensor-threshold** {**balanced** | **client-preferred** | **client-priority** | **sensor-preferred** | **sensor-priority** } | **service-priority** {**coverage** | **service-assurance**}]

Syntax Description	**interval** *no-of-hours*	Enter the number of hours for the FRA interval. Valid range is 1 to 24 hours.
	sensitivity {**high**	**low**	**medium**}	Configures the FRA coverage overlap sensitivity as high, low, or medium.
	sensor-threshold {**balanced**	**client-preferred**	**client-priority**	**sensor-preferred**	**sensor-priority**}	Configures FRA sensor threshold to one of the available options.
	service-priority {**coverage**	**service-assurance**}	Configures FRA service priority to Coverage or Service Assurance.

Command Default	None

Command Modes	config

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines Ensure that the RF group leader for 802.11b/g and 802.11a bands are same across RF domain and make sure that the RF group leader has FRA enabled.

Examples

The following example show how to configure the FRA interval to 8 hours:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap fra interval 8
```

ap fra 5-6ghz

To enable Flexible Radio Assignment (FRA) 5/6GHz on all Cisco APs, use the **ap fra 5-6ghz** command in the global configuration mode. Use the **no** form of this command to disable the feature.

ap fra 5-6ghz

no ap fra 5-6ghz

Syntax Description	This command has no arguments or keywords.

Command Default	None

Command Modes	Global Configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

This example shows how to enable Flexible Radio Assignment (FRA) 5/6GHz on all Cisco APs:

```
Device(config)# ap fra 5-6ghz
Device(config)# no ap fra 5-6ghz
```

ap fra 5-6ghz freeze

To enable 5-6-GHz Flexible Radio Assignment (FRA) freeze on all Cisco APs, use the **ap fra 5-6ghz freeze** command in the global configuration mode. Use the **no** form of this command to disable the feature.

ap fra 5-6ghz freeze

no ap fra 5-6ghz freeze

Syntax Description	There are no arguments for this command.

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

This example shows how to enable 5-6-GHz Flexible Radio Assignment (FRA) freeze on all Cisco APs:

```
Device# ap fra 5-6ghz freeze
Device# no ap fra 5-6ghz freeze
```

ap fra 5-6ghz interval

To configure the Flexible Radio Assignment (FRA) 5/6-GHz interval in hours, use the **ap fra 5-6ghz interval** command.

ap fra 5-6ghz interval *number-of-hours*

Syntax Description	*number-of-hours*	Specifies the FRA 5/6-GHz interval in hours. The value range is between 1 to 24 hours.

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

This example shows how to configure the Flexible Radio Assignment (FRA) 5/6-GHz interval in hours:

```
Device(config)# ap fra 5-6ghz interval 12
```

ap hyperlocation

To configure hyperlocation and related parameters, use the **ap hyperlocation** command. To disable hyperlocation and related parameters, use the **no** form of this command.

ap hyperlocation [**ble-beacon**{*beacon-id* | **interval** *interval-value*} | **threshold** {**detection** *value-in-dBm* | **reset** *value-btwn-0-99* | **trigger** *value-btwn-1-100*}]
[no] ap hyperlocation [**ble-beacon**{*beacon-id* | **interval** *interval-value*}|**threshold** {**detection** *value-in-dBm* | **reset** *value-btwn-0-99* | **trigger** *value-btwn-1-100*}]

Syntax Description

ble-beacon	Enables BLE beacon parameters.
beacon-id	BLE beacon ID. The range is from 1 to 4.
interval	Sets the BLE beacon interval.
interval-value	BLE beacon interval value, in hertz. The range is from 1 to 10. The default is1.
threshold detection *value-in-dBm*	Sets threshold to filter out packets with low RSSI. The **[no]** form of the command resets the threshold to its default value.
threshold reset *value-btwn-0-99*	Resets value in scan cycles after trigger. The **[no]** form of the command resets the threshold to its default value.
threshold trigger *value-btwn-1-100*	Sets the number of scan cycles before sending a BAR to clients. The **[no]** form of the command resets the threshold to its default value. **Note** Ensure that the hyperlocation threshold reset value is less than the threshold trigger value.

Command History

Release	Modification
Cisco IOS XE Denali 16.2.1	This command was introduced.
Cisco IOS XE Denali 16.3.1	This command was modified. The **ble-beacon** keyword was added.

ap image

To configure an image on all access points that are associated to the device, use the **ap image** command.

ap image {**predownload** | **reset** | **swap**}

Syntax Description	**predownload**	Instructs all the access points to start predownloading an image.
	reset	Instructs all the access points to reboot.
	swap	Instructs all the access points to swap the image.

Command Default	None

Command Modes	Any command mode

Command History

Release	**Modification**
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to predownload an image to all access points:

```
Device# ap image predownload
```

This example shows how to reboot all access points:

```
Device# ap image reset
```

This example shows how to swap the access point's primary and secondary images:

```
Device# ap image swap
```

ap image site-filter

To upgrade an access point (AP) image using software maintenance update (SMU) based on a site filter, use the **ap image site-filter** command.

ap image site-filter file *file-name* **any remove-all** { **add** *site-tag* | **apply** | **clear** | **remove** *site-tag* }

Syntax Description	*file-name*	SMU image name.
	site-tag	Site tag name.
	add	Adds a site in the site filter.
	apply	Predownloads the AP image and performs rolling AP upgrade in staggered manner.
	clear	Clears the existing site filters.
	remove	Removes a site from the site filter.
	any	
	remove-all	

Command Default	None

Command Modes	Privileged EXEC (#)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.11.1	This command was introduced.
	Cisco IOS XE Cupertino 17.9.1	This command was modified by adding the keywords **any** and **remove-all**.

Example

The following example shows how to upgrade an AP image using the SMU, based on a site filter:

```
Device# ap image site-filter file vwlc_apsp_16.11.1.0_74.bin add bgl18
```

ap image upgrade

To instruct all the APs to start image upgrade, use the **ap image upgrade** command.

ap image upgrade [**abort** | **destination** *controller-name* {*controller-ipv4-addr controller-ipv6-addr* } | **dry-run**]

Syntax Description	**abort**	Cancels AP image upgrade.
	destination *controller-name* {*controller-ipv4-addr* | *controller-ipv6-addr*}	Instructs all the APs to associate with the destination controller whose name and IP address you must enter.
	dry-run	Runs the rolling AP image upgrade in dry-run mode.

Command Default	None

Command Modes	Privileged EXEC

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to cancel an AP image upgrade:

```
Device# ap image upgrade abort
```

ap link-encryption

To enable Datagram Transport Layer Security (DTLS) data encryption for access points, use the **ap link-encryption** command. To disable the DTLS data encryption for access points, use the **no** form of this command.

ap link-encryption
no ap link-encryption

Syntax Description	This command has no keywords and arguments.

Command Default	Disabled

Command Modes	Global configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to enable data encryption for all the access points that are joined to the controller:

```
Device(config)# ap link-encryption
```

ap name icap subscription ap rf spectrum

To configure spectrum analysis on an AP, use the **ap nameicap subscription ap rf spectrum** command. To disable spectrum analysis, use the **no** form of the command.

ap name *ap_name* **icap subscription ap rf spectrum { enable** | *slot }*

Syntax Description	**enable** Enable the subscription.
	slot Configures the radio slots to collect RF spectrum measurements.
	ap_name AP name

Command Default   Disabled

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Usage Guidelines   For the subscription to function, at least one radio slot must also be configured, having Cisco CleanAir enabled and operational state as up.

Example

The following example shows how to enable spectrum analysis on a AP:

```
Device# ap name 4800AP icap subscription ap rf spectrum enable
Device# ap name 4800AP icap subscription ap rf spectrum slot 0
Device# show ap name 4800AP icap subscription ap rf spectrum chassis active
```

ap name antenna band mode

To configure the antenna mode, use the **ap name***ap- name* **antenna-band-mode{ single | dual }** command.

ap name*ap-name* **antenna-band-mode** {**single** | **dual**}

Syntax Description		
	ap- name	Name of the Cisco lightweight access point.
	antenna-band-mode	Instructs the access point to enable the band mode of antenna.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

This example shows how to configure the antenna band mode of access point.

```
Deviceap name <ap-name> antenna-band-mode single
```

ap name ble

To enable the able ltx state on the AP, use the **ap name** *ap name* **ble** command.

ap name *ap_name* **antena-band-mode {admin | ibeacon | interval | no-advertisement | sync | vibeacon}**

Syntax Description	ap name	AP Name
	admin	Enables the ble ltx admin state.
	ibeacon	Enables the BLE LTX iBeacon configuration.
	interval	Enables the BLE LTX scan configuration interval.
	no-advertisement	Enables the BLE LTX No Advertisement.
	Sync	Enables the BLE LTX synchronize.
	vibeacon	Enables the BLE LTX viBeacon configuration.

Command Default	Disabled

Command Modes	Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples

The following example shows how to enable ble on the AP:

```
Device# ap name test ble
```

ap name clear-personal-ssid

To clear the personal SSID from a Cisco OfficeExtend Access Point (OEAP), use the **ap name clear-personal-ssid** command.

ap name *ap-name* **clear-personal-ssid**

Syntax Description	*ap-name* AP name.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to clear the personal SSID from a Cisco OEAP:

```
Device# ap name my-oeap clear-personal-ssid
```

ap name controller

To configure the controller on the AP, use the **ap name** *ap name* **controller** command.

ap name *ap_name* **controller {primary | secondary | tertiary}** *name {A.B.C.D | X:X:X::XX}*

Syntax Description		
	ap name	AP Name
	controller	Configures the controller.
	primary	Configures the primary controller.
	secondary	Configures the secondary controller.
	tertiary	Configures the tertiary controller.
	name	Specifies the name of the primary controller, secondary controller, or tertiary controller.
	A.B.C.D	Specifies theIPv4 address of the primary controller, secondary controller, or tertiary controller.
	X:X:X::XX	Specifies theIPv6 address of the primary controller, secondary controller, or tertiary controller.

Command Default Disabled

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples The following example shows how to configure the controller on the AP:

```
Device# ap name cisco-ap controller primary cisco-primary-controller 10.1.1.1
```

ap name core-dump

To configure a Cisco lightweight access point's memory core dump, use the **ap name core-dump** command. To disable a Cisco lightweight access point's memory core dump, use the **no** form of this command.

ap name *ap-name* **core-dump** *tftp-ip-addr* *filename* {**compress** | **uncompress**}
ap name *ap-name* [**no**] **core-dump**

Syntax Description	*ap-name* Name of the access point.

	ap-name	Name of the access point.
	tftp-ip-addr	IP address of the TFTP server to which the access point sends core dump files.
	filename	Name that the access point used to label the core file.
	compress	Compresses the core dump file.
	uncompress	Uncompresses the core dump file.

Command Default	None
Command Modes	Privileged EXEC(#)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The access point must be able to reach the TFTP server before you can use this command.

This example shows how to configure and compress the core dump file:

```
Device# ap name AP2 core-dump 192.1.1.1 log compress
```

ap name country

To configure the country of operation for a Cisco lightweight access point, use the **ap name country** command.

ap name *ap-name* **country** *country-code*

Syntax Description	*ap-name*	Name of the Cisco lightweight access point.
	country-code	Two-letter or three-letter country code.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   Cisco devices must be installed by a network administrator or qualified IT professional and the installer must select the proper country code. Following installation, access to the unit should be password protected by the installer to maintain compliance with regulatory requirements and to ensure proper unit functionality. See the related product guide for the most recent country codes and regulatory domains. Also, access point regulatory domains are defined during the access point manufacturing process. You can change the access point country code if the new country code matches a country that is valid within the access point regulatory domain. If you try to enter a country that is not valid to the access point regulatory domain, the command fails.

This example shows how to configure the Cisco lightweight access point's country code to DE:

```
Device# ap name AP2 country JP
```

ap name crash-file

To manage crash data and radio core files for the Cisco access point, use the **ap name crash-file** command.

ap name *ap-name* **crash-file** {**get-crash-data** | **get-radio-core-dump** {**slot 0** | **slot 1**}}

Syntax Description	*ap-name*	Name of the Cisco lightweight access point.
	get-crash-data	Collects the latest crash data for a Cisco lightweight access point.
	get-radio-core-dump	Gets a Cisco lightweight access point's radio core dump
	slot	Slot ID for Cisco access point.
	0	Specifies Slot 0.
	1	Specifies Slot 1.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to collect the latest crash data for access point AP3:

```
Device# ap name AP3 crash-file get-crash-data
```

This example shows how to collect the radio core dump for access point AP02 and slot 0:

```
Device# ap name AP02 crash-file get-radio-core-dump slot 0
```

ap name dot11 24ghz | 5ghz | 6ghz rrm channel update mesh

To trigger the RRM DCA for a specific AP, use the **ap name** *cisco-ap-name* **dot11** {**24ghz** | **5ghz** | **6ghz**} **rrm channel update mesh**

ap name *cisco-ap-name* **dot11** { **24ghz** | **5ghz** | **6ghz** } **rrm channel update mesh**

Syntax Description	This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

This example shows how to trigger the RRM DCA for a specific AP:

```
Device# ap name Cisco-ap-name dot11 5ghz rrm channel update mesh
```

ap name dot11 24ghz slot 0 SI

To enable Spectrum Intelligence (SI) for the dedicated 2.4-GHz radio hosted on slot 0 for a specific access point, use the **ap name dot11 24ghz slot 0 SI** command.

ap name *ap-name* **dot11** { **24ghz** | **5ghz** | **dual-band** | **rx-dual-band** } **slot** *slot ID* **SI**

Syntax Description	*ap_name*	Name of the Cisco Access Point.
	slot 0	Enables Spectrum Intelligence (SI) for the dedicated 2.4-GHz radio hosted on slot 0 for a specific access point.
		Here, 0 refers to the Slot ID.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Example

The following example shows how to configure Spectrum Intelligence of an AP.

```
Device# ap name AP-SIDD-A06 dot11 24ghz slot 0 SI
```

ap name dot11 24ghz slot antenna

To configure the 802.11b antenna hosted on slot 0, use the **ap name dot11 24ghz slot antenna** command.

ap name *ap-name***dot1124ghzslot 0antenna**{**ext-ant-gain** *antenna-gain-value* | **selection** [**internal** | **external**}

Syntax Description		
ap-name	Name of the AP.
24ghz	Configures 802.11b parameters.
slot	Sets the slot ID for the Cisco Access Point.
antenna	Configures the 802.11b Antenna.
ext-ant-gain	Configures the 802.11b External Antenna Gain. The value range is 0 - 4294967295. Enter External Antenna Gain value in multiple of .5 dBi units (i.e. An integer value 4 means 4 x 0.5 = 2 dBi of gain)
selection	Configure the 802.11b Antenna selection (internal/external)

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines

Example

The following example shows how to configure the channel width of an AP.

```
Device# ap name ax1 dot11 24ghz slot 0 antenna selection external
```

ap name dot11 24ghz slot beamforming

To configures beamforming for the 2.4-GHz radio hosted on slot 0 for a specific access point, use the **ap name dot11 24ghz slot beamforming** command.

ap name *ap-name***dot1124ghzslot 0beamforming**

Syntax Description	**beamforming**	Enable 802.11b tx beamforming - 5 GHz

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines

Example

The following example shows how to configure beamforming of an AP.

```
Device# ap name AP-SIDD-A06 dot11 24ghz slot 0 beamforming
```

ap name dot11 24ghz slot channel

To configure advanced 802.11 channel assignment parameters for Cisco AP, use the **ap name dot11 24ghz slot channel** command.

ap name *ap-name* **dot11 24ghz slot 0 channel** { *channel_number* | **auto** }

Syntax Description	*channel_number*	Advanced 802.11 channel assignment parameters for Cisco AP. Enter a channel number from 1 - 14.
	auto	Enables auto RF.

Command Default	None

Command Modes	Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines

Example

The following example shows how to configure the channel of an AP.

```
Device# ap name AP-SIDD-A06 dot11 24ghz slot 0 channel auto
```

ap name dot11 24ghz slot cleanair

To enable CleanAir for 802.11b radio hosted on slot 0 for a specific access point, use the **ap name dot11 24ghz slot cleanair** command.

ap name *ap-name* **dot11 24ghz slot 0 cleanair**

Syntax Description	**cleanair**	Enables 802.11b cleanair management

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.
Cisco IOS XE Cupertino 17.9.1	This command has been deprecated.

Example

The following example shows how to configure the cleanair of an AP.

```
Device# ap name AP-SIDD-A06 dot11 24ghz slot 0 cleanair
```

ap name dot11 24ghz slot dot11n antenna

To configure 802.11n antenna for 2.4-GHz radio hosted on slot 0 for a specific access point, use the **ap name dot11 24ghz slot dot11n antenna** command.

ap name *ap-name* **dot11 24ghz slot 0 dot11n antenna** { **A** | **B** | **C** | **D** }

Syntax Description

dot11n	Configures 802.11n antenna for 2.4-GHz radio hosted on slot 0 for a specific access point.
antenna	Configures the 802.11n - 2.4 GHz antenna selection from antenna ports A, B, C, and D.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Example

The following example shows how to configure the channel width of an AP.

```
Device# ap name AP-SIDD-A06 dot11 24ghz slot 0 dot11n antenna A
```

ap name dot11 24ghz slot dot11ax bss-color

To set the BSS color on the 2.4 GHz, 5 GHz, or dual-band radio, for a specific access point, use the **ap name dot11 24ghz slot dot11ax bss-color** command.

ap name *ap-name* **dot11 24ghz slot 0 dot11ax bss-color** *<1-63>*

bss-color	Configures 802.11ax-2.4GHz BSS color

Syntax Description

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE 16.12.1	This command was introduced.

Example

The following example shows how to disable 802.11b radio on Cisco AP.

```
Device# ap name AP-SIDD-A06 dot11 24ghz slot 0 dot11ax bss-color 3
```

ap name dot11 24ghz slot shutdown

To disable 802.11b radio hosted on slot 0 for a specific access point, use the **ap name dot11 24ghz slot shutdown** command.

ap name *ap-name* **dot11 24ghz slot 0 shutdown**

Syntax Description

shutdown	Disables 802.11b radio on Cisco AP

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Example

The following example shows how to disable 802.11b radio on Cisco AP.

```
Device# ap name AP-SIDD-A06 dot11 24ghz slot 0 shutdown
```

ap name dot11 24ghz radio role manual sniffer channel

To enable XOR radio role Sniffer support on AP from controller, use the **ap name dot11 24ghz radio role manual sniffer channel** command.

ap name dot11 24ghz radio role manual sniffer channel *channel-number* **ip** *ip-address*

Syntax Description

channel-number ip *ip-address*	Is the channel number and IP address.

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.8.1	This command was introduced.

Usage Guidelines

This example shows how to enable XOR radio role Sniffer support on AP from controller:

```
Device# enable
Device# ap name AP687D.B45C.189C dot11 24ghz shutdown
Device# ap name AP687D.B45C.189C dot11 24ghz radio role manual sniffer channel 100 ip
9.4.197.85
Device# ap name AP687D.B45C.189C no dot11 24ghz shutdown
Device# end
```

ap name dot11 5ghz radio role manual sniffer channel

To enable XOR radio role Sniffer support on AP from controller, use the **ap name dot11 5ghz radio role manual sniffer channel** command.

ap name dot11 5ghz radio role manual sniffer channel *channel-number* **ip** *ip-address*

Syntax Description

| **channel-number ip** *ip-address* | Is the channel number and IP address. |

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.8.1	This command was introduced.

Usage Guidelines

This example shows how to enable XOR radio role Sniffer support on AP from controller:

```
Device# enable
Device# ap name AP687D.B45C.189C dot11 5ghz shutdown
Device# ap name AP687D.B45C.189C dot11 5ghz radio role manual sniffer channel 100 ip
9.4.197.85
Device# ap name AP687D.B45C.189C no dot11 5ghz shutdown
Device# end
```

ap name dot11 5ghz slot 1 dual-radio mode

To configure the 802.11a dual radio on the AP, use the **ap name** *ap-name* **dot11 5ghz slot 1 dual-radio mode**

ap name *ap-name* **dot11 5ghz slot 1 dual-radio mode**   { **enable** | **disable** }

Syntax Description	**dual-radio mode** Configures the 802.11a dual-radio on the AP.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Example

The following example shows how to configure the 802.11a dual radio on the AP:

```
Device#ap name ap-name dot11 5ghz slot 1 dual-radio mode enable
```

ap name dot11 5ghz slot radio role

To set the manual radio role to either client serving or monitor, use the **ap name** *ap-name* **dot11 5ghz slot** {**1** | **2**} **radio role** command.

ap name *ap-name* **dot11 5ghz slot** { **1** | **2** } **radio role** { **auto** | **manual** { **client-serving** | **monitor** } }

Syntax Description		
	radio role	Configures the 802.11a radio role, either manual or auto.
	manual	Configures either client-serving manual role or monitor manual role.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Example

The following example shows how to set the manual radio role to either client serving or monitor:

```
Device# ap name ap-name dot11 5ghz slot 2 radio role manual monitor
```

ap name dot11 channel width

To configure the channel width of an AP, use the **ap name dot11 channel width** command.

ap name *ap-name* **dot11** { **24ghz** | **5ghz** | **dual-band** | **rx-dual-band** } **channel width** { **160** | **20** | **40** | **80** | **80+80** }

Syntax Description		
	ap-name	Name of the Cisco Lightweight Access Point.
	160	160 MHz.
	20	20 MHz.
	40	40 MHz.
	80	80 MHz.
	80+80	80+80 MHz.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Example

The following example shows how to configure the channel width of an AP.

```
Device# ap name ax1 dot11 5ghz channel width 80+80
```

ap name dot11 dual-band cleanair

To configure CleanAir for a dual band radio, use the **ap name dot11 dual-band cleanair** command.

ap name *ap-name* **dot11 dual-band cleanair**
ap name *ap-name* **no dot11 dual-band cleanair**

Syntax Description	*ap-name*	Name of the Cisco AP.
	cleanair	Specifies the CleanAir feature.

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
Cisco IOS XE Cupertino 17.9.1	This command was deprecated.

This example shows how to enable CleanAir for a dual band radio of the access point AP01:

```
Device# ap name AP01 dot11 dual-band cleanair
```

ap name dot11 dual-band shutdown

To disable dual band radio on a Cisco AP, use the **ap name dot11 dual-band shutdown** command.

ap name *ap-name* **dot11 dual-band shutdown**
ap name *ap-name* **no dot11 dual-band shutdown**

Syntax Description	*ap-name*	Name of the Cisco AP.
	shutdown	Disables the dual band radio on the Cisco AP.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

This example shows how to disable dual band radio on the Cisco access point AP01:

```
Device# ap name AP01 dot11 dual-band shutdown
```

ap name dot11 rrm profile

To configure Radio Resource Management (RRM) performance profile settings for a Cisco lightweight access point, use the **ap name dot11 rrm profile** command.

ap name *ap-name* **dot11** {**24ghz** | **5ghz**} **rrm profile** {**clients** *value* | **customize** | **foreign** *value* | **noise** *value* | **throughput** *value* | **utilization** *value*}

Syntax Description		
ap-name	Name of the Cisco lightweight access point.	
24ghz	Specifies the 2.4 GHz band.	
5ghz	Specifies the 5 GHz band.	
clients	Sets the access point client threshold.	
value	Access point client threshold from 1 to 75 clients.	
	Note	The default client threshold is 12.
customize	Turns on performance profile customization for an access point.	
	Note	Performance profile customization is off by default.
foreign	Sets the foreign 802.11 transmitter interference threshold.	
value	Foreign 802.11 transmitter interference threshold from 0 to 100 percent.	
	Note	The default is 10 percent.
noise	Sets the 802.11 foreign noise threshold.	
value	802.11 foreign noise threshold between –127 and 0 dBm.	
	Note	The default is —70 dBm.
throughput	Sets the data-rate throughput threshold.	
value	802.11 throughput threshold from 1000 to 10000000 bytes per second.	
	Note	The default is 1,000,000 bytes per second.
utilization	Sets the RF utilization threshold.	
	Note	The operating system generates a trap when this threshold is exceeded.
value	802.11 RF utilization threshold from 0 to 100 percent.	
	Note	The default is 80 percent.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to set the AP1 clients threshold to 75 clients:

```
Device# ap name AP1 dot11 24ghz rrm profile clients 75
```

This example shows how to turn performance profile customization on for 802.11a Cisco lightweight access point AP1:

```
Device# ap name AP1 dot11 5ghz rrm profile customize
```

This example shows how to set the foreign 802.11a transmitter interference threshold for AP1 to 0 percent:

```
Device# ap name AP1 dot11 5ghz rrm profile foreign 0
```

This example shows how to set the 802.11a foreign noise threshold for AP1 to 0 dBm:

```
Device# ap name AP1 dot11 5ghz rrm profile noise 0
```

This example shows how to set the AP1 data-rate threshold to 10000000 bytes per second:

```
Device# ap name AP1 dot11 5ghz rrm profile throughput 10000000
```

This example shows how to set the RF utilization threshold for AP1 to 100 percent:

```
Device# ap name AP1 dot11 5ghz rrm profile utilization 100
```

ap name export support-bundle mode

To export the AP support-bundle from the AP to the controller, use the **ap name** *Cisco-AP-name* **export support-bundle mode**

ap name *Cisco-AP-name* **export support-bundle mode** { **scp** | **tftp** } **target ip-address** { *A.B.C.D* | *X:X:X:X::X* } **path** *file-path*

Syntax Description		
	scp	Transfers the support-bundle through the SCP mode.
	tftp	Transfers the support-bundle through the TFTP mode.
	target	Indicates the target details for file transfer using TFTP.
	ip-address	Indicates the target IP address, either IPv4 or IPv6, for the file transfer using SCP or TFTP.
	A.B.C.D	Indicates the target IPv4 address.
	X:X:X:X::X	Indicates the target IPv6 address.
	path	Indicates the target file path.
	file-path	Indicates the file path.

Command Default   None

Command Modes   Privileged EXEC mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

This example shows how to export the AP support-bundle from the AP to the controller:

```
Device> ap name Cisco-AP-name export support-bundle mode scp target ip-address 10.1.1.1
path file-path
```

ap name hyperlocation

To configure hyperlocation and related parameters for an access point (AP), use the **ap name hyperlocation** command. To disable hyperlocation and related parameters, use the **no** form of this command.

ap name *ap-name* **hyperlocation ble-beacon** *beacon-id* { **major** *major-value* | **minor** *minor-value* | **txpwr** *att-value* }

Syntax Description		
	ap-name	Access point name.
	ble-beacon	Configures BLE beacon parameters.
	beacon-id	BLE beacon ID.
	major	Configures BLE beacon major parameter.
	major-value	BLE beacon major value. The range is from 0 to 65535. The default is 0.
	minor	Configures BLE beacon minor parameter.
	minor-value	BLE beacon minor value. The range is from 0 to 65535. The default is 0.
	txpwr	Configures BLE beacon attenuation level.
	att-value	BLE beacon attenuation value, in dBm. The range is from 0 to 52. The default is 0.

Command Default   BLE beacon details are not configured.

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

This example shows how to configure hyperlocation and related parameters for an AP:

```
Device# ap name test-ap hyperlocation ble-beacon 3 txpwr 50
```

ap name image

To configure an image on a specific access point, use the **ap name image** command.

ap **name** *ap-name* **image** {**predownload** | **swap**}

Syntax Description	*ap-name*	Name of the Cisco lightweight access point.
	predownload	Instructs the access point to start the image predownload.
	swap	Instructs the access point to swap the image.

Command Default None

Command Modes Privileged EXEC(#)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to predownload an image to an access point:

```
Device# ap name AP2 image predownload
```

This example shows how to swap an access point's primary and secondary images:

```
Device# ap name AP2 image swap
```

ap name indoor

To enable the access point in the indoor mode, use the **ap name** *ap name* **indoor** command.

ap name *ap_name* **indoor**

Syntax Description		
ap name	AP Name
indoor	Enables the access point in the indoor mode.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples

The following example shows how to enable the access point in the indoor mode:

```
Device# ap name test indoor
```

ap name iot-radio firmware overwrite

To set the IoT radio firmware to default, use the **ap name** *ap-name* **iot-radio firmware overwrite** command.

ap name *ap-name* **iot-radio firmware overwrite**

Syntax Description

ap-name	Specifies the name of the Cisco AP.

Command Default   None

Command Modes   Privileged EXEC mode

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Example

This example shows how to set the IoT radio firmware to default:

```
Device# ap name Cisco-ap iot-radio firmware overwrite
```

ap name ipsla

To configure ipsla on the AP, use the **ap name** *ap name* **ipsla** command.

ap name *ap_name* **ipsla**

Syntax Description	**ap name** AP Name
	ipsla Enables the ipsla on the access point.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples   The following example shows how to configure ipsla on the access point:

```
Device# ap name test ipsla
```

ap name keepalive

To enable the keepalive option on the AP, use the **ap name** *ap name* **keepalive** command.

ap name *ap_name* **keepalive**

Syntax Description This command has no arguments or keywords.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 17.03.1	This command was introduced.

Examples The following example shows how to enable the keepalive option on the AP:

```
Device# ap name test keepalive
```

ap name lan

To configure LAN port configurations for APs, use the **ap name lan** command. To remove LAN port configurations for APs, use the **ap name no lan** command.

ap name *ap-name* **[no]lan port-id** *port-id* { **shutdown** | **vlan-access** }

Syntax Description		
	no	Removes LAN port configurations.
	port-id	Configures the port.
	port-id	The ID of the port. The range is 1-4
	shotdown	Disables the Port.
	vlan-access	Enables VLAN access to Port.

Command Default	None
Command Modes	Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to enable VLAN access to port:

```
Device# ap name AP1 lan port-id 1 vlan-access
```

ap name led

To enable the LED state for an access point, use the **ap name led** command. To disable the LED state for an access point, use the **no** form of this command.

ap name *ap-name* **led**
no ap name *ap-name* [**led**] **led**

Syntax Description	*ap-name*	Name of the Cisco lightweight access point.
	led	Enables the access point's LED state.

Command Default None

Command Modes Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to enable the LED state for an access point:

```
Device# ap name AP2 led
```

This example shows how to disable the LED state for an access point:

```
Device# ap name AP2 no led
```

ap name led-brightness-level

To configure the LED brightness level on the AP, use the **ap name** *ap name* **led-brightness-level** command.

ap name *ap_name* **led-brightness-level {1–8}**

Syntax Description		
ap name	AP Name	
led brightness level	Configures the led brightness level.	
	Note	Valid led brightness level is from 1 to 8.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples The following example shows the LED brightness level on the access point:

```
Device# ap name cisco-ap led-brightness-level2
```

ap name location

To modify the descriptive location of a Cisco lightweight access point, use the **ap name location** command.

ap name *ap-name* **location** *location*

Syntax Description	*ap-name*	Name of the Cisco lightweight access point.
	location	Location name of the access point (enclosed by double quotation marks).

Command Default   None

Command Modes   Privileged EXEC(#)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The Cisco lightweight access point must be disabled before changing this parameter.

This example shows how to configure the descriptive location for access point AP1:

```
Device# ap name AP1 location Building1
```

ap name mesh backhaul rate dot11abg

To set the mesh backhaul dot11abg rate, use the **ap name** *ap-name* **mesh backhaul rate dot11abg** command.

ap name *ap-name* **mesh backhaul rate dot11abg** { **RATE_11M** | **RATE_12M** | **RATE_18M** | **RATE_1M** | **RATE_24M** | **RATE_2M** | **RATE_36M** | **RATE_48M** | **RATE_54M** | **RATE_5DOT5M** | **RATE_6M** | **RATE_9M** }

Syntax Description	**RATE_11M** | **RATE_12M** | **RATE_18M** | **RATE_1M** | **RATE_24M** | **RATE_2M** | **RATE_36M** | **RATE_48M** | **RATE_54M** | **RATE_5DOT5M** | **RATE_6M** | **RATE_9M**	Sets the mesh backhaul rates.

Command Default	None

Command Modes	Privileged EXEC (#)

Command History	**Release**	**Modification**
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines	None

Example

The following example shows you how to configure the AP mesh backhaul dot11abg rate:

```
Device# ap name cisco-ap mesh backhaul rate dot11abg RATE_11M
```

ap name mdsn-ap

To configure mdsn-ap on the AP, use the **ap name** *ap name* **mdsn-ap** command.

ap name *ap_name* **mdsn-ap {disable | enable | vlan}** *add delete*

Syntax Description	**ap name**	AP Name
	disable	Disables the mDNS access point.
	enable	Enables the mDNS access point.
	vlan	Adds or deletes the VLAN from mDNS access point.
	add	Adds vlan to mDNS AP.
	add	Deletes vlan from the mDNS AP.

Command Default	None

Command Modes	Privileged EXEC (#)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples

The following example shows how to enable mdns on the AP:

```
Device# Device# ap name test mdns enable
```

ap name mesh backhaul rate dot11ac

To set the mesh backhaul dot11ac rate, use the **ap name** *ap-name* **mesh backhaul rate dot11ac** command.

ap name *ap-name* **mesh backhaul rate dot11ac mcs** *0-9* **ss** *1-4*

Syntax Description	**mcs** *0-9*	Sets the mesh backhaul 11ac MCS rate.
	0-9	Indicates the mesh backhaul rate 11ac mcs index .
	ss	Sets the mesh backhaul 11ac spatial stream.
	1-4	Indicates the mesh backhaul 11ac spatial stream value.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to configure the AP mesh backhaul dot11ac rate:

```
Device# ap name cisco-ap mesh backhaul rate dot11ac mcs 5 ss 3
```

ap name name mesh backhaul rate dot11ax

To set the mesh backhaul dot11ax rate, use the **ap name** *ap-name* **mesh backhaul rate dot11ax** command.

ap name *ap-name* **mesh backhaul rate dot11ax mcs** *0-11* **ss** *1-8*

Syntax Description	**mcs**	Sets the mesh backhaul 11ax MCS rate.
	0-11	Indicates the mesh backhaul 11ax MCS index.
	ss	Sets the mesh backhaul 11ax spatial stream.
	1-8	Indicates the mesh backhaul 11ax spatial stream value. Range 1-4 indicates the range for 2.4-Ghz, and range 1 - 8 indicates the range for 5-Ghz backhaul.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to configure the AP mesh backhaul dot11ax rate:

```
Device# ap name cisco-ap mesh backhaul rate dot11ax mcs 6 ss 5
```

ap name name new-ap-name

To configure the new Cisco AP name, use the **ap name** *ap name* **name** *new-ap-name* command.

ap name *ap_name* **name** *new-ap-name*

Syntax Description	**ap name**	AP Name
	name	Specifies the new Cisco AP name.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples   The following example shows how to configure the new Cisco AP:

```
Device# ap name test name test2
```

ap name no

To negate a command or set its defaults on the AP, use the **no** command.

ap name *ap_name* **no**

Syntax Description	**ap name**	AP Name
	no	Negate a command or set its defaults.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples   The following example shows how to negate a command or set its defaults on the AP:

```
Device# ap name test no
```

ap name mesh backhaul rate

To configure the AP mesh backhaul rate, use the **ap name** *ap-name* **mesh backhaul rate** command.

ap name *ap-name* **mesh backhaul rate** { **auto** | **dot11abg** | **dot11ac** | **dot11ax** | **dot11n** }

Syntax Description	**auto** Configures the mesh backhaul rate as auto.
	dot11abg Configures the mesh backhaul dot11abg rate.
	dot11ac Configures the mesh backhaul dot11ac rate.
	dot11ax Configures the mesh backhaul dot11ax rate.
	dot11n Configures the mesh backhaul dot11n rate.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to configure the AP mesh backhaul rate as auto:

```
Device# ap name cisco-ap mesh backhaul rate auto
```

ap name mesh backhaul rate dot11n

To set the mesh backhaul dot11n rate, use the **ap name** *ap-name* **mesh backhaul rate dot11n** command.

ap name *ap-name* **mesh backhaul rate dot11n mcs** *0-31*

Syntax Description	**mcs** *0-31*	Sets the mesh backhaul 11n MCS rate.
	0-31	Indicates the mesh backhaul rate dot11n mcs index.s

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to configure the AP mesh backhaul dot11n rate:

```
Device# ap name cisco-ap mesh backhaul rate dot11n mcs 20
```

ap name mesh block-child

To set mesh block-child state for a mesh AP, use the **ap name mesh block-child** command.

ap **name** *ap-name* **mesh block-child**

Syntax Description

ap-name	Name of the mesh AP.

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the mesh block-child state for a mesh AP:

```
Device# ap name mymeshap mesh block-child
```

ap name mesh daisy-chaining

To configure daisy-chain mode for a mesh AP, use the **ap name** *ap-name* **mesh daisy-chaining** command.

ap name *ap-name* **mesh daisy-chaining** [**strict-rap**]

Syntax Description		
ap-name	Name of the mesh AP.
strict-rap	Configures to allow only the Ethernet interface as mesh uplink.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure daisy-chaining mode for a mesh AP:

```
Device# ap name mymeshap mesh daisy-chaining
```

ap name mesh ethernet mode access

To configure the mode of Ethernet interface as access for a mesh AP, use the **ap name** *ap-name* **mesh ethernet** *port-no* **mode access** command.

ap name *ap-name* **mesh ethernet** *port-no* **mode access** *vlan-id*

Syntax Description		
	ap-name	Name of the mesh AP.
	port-no	Port number of the AP. Valid options are 1, 2, 3, and 4.
	vlan-id	VLAN ID. Valid range is from 0 to 4095.

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the mode of Ethernet interface as access for a mesh AP:

```
Device# ap name mymeshap mesh ethernet 0 mode access 10
```

ap name mesh ethernet mode trunk

To configure the mode of Ethernet interface as trunk for a mesh AP, use the **ap name** *ap-name* **mesh ethernet** *port-no* **mode trunk** command.

ap name *ap-name* **mesh ethernet** *port-no* **mode trunk vlan** {**allowed** | **native**}*vlan-id*

Syntax Description	*ap-name* Name of the mesh AP.
	port-no Port number of the AP. Valid options are 1, 2, 3, and 4.
	allowed Configures allowed VLANs for the trunk port.
	native Configures native VLAN for the trunk port.
	vlan-id VLAN ID. Valid range for allowed VLANs is from 0 to 4095. Valid range for native VLANs is 1 to 4095.

Command Default	None
Command Modes	Privileged EXEC

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the mode of Ethernet interface as trunk for a mesh AP and also configure allowed VLANs for the trunk port:

```
Device# ap name mymeshap mesh ethernet 0 mode trunk vlan allowed 10
```

ap name mesh linktest

To perform a link test with a mesh AP, use the **ap name** *ap-name***mesh linktest** command.

ap name *ap-name* **mesh linktest** *dest-ap-mac data-rate pkts-per-sec pkt-size test-duration*

Syntax Description	

ap-name	Name of the mesh AP.
dest-ap-mac	MAC address of the destination mesh AP.
data-rate	Data rate in Mbps (1, 2, 5.5, 6, 9, 11, 12, 24, 36, 48, 53, m0-m15)
pkts-per-sec	Packets to be sent per second. Valid range is from 1 to 25000.
pkt-size	Packet size. Valid range is from 1 to 1500.
test-duration	Test duration. Valid range is from 10 to 300 seconds.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure a link test for a mesh AP:

```
Device# ap name mymeshap mesh linktest 00c0.00a0.03fa.0000.0000.0000
 9 100 10 180
```

ap name mesh parent preferred

To configure preferred parent for a mesh AP, use the **ap name mesh parent preferred** command.

ap name *ap-name* **mesh parent preferred** *mac-address*

Syntax Description		
	ap-name	Name of the mesh AP.
	mac-address	Radio MAC address of the parent AP.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to preferred parent for a mesh AP:

```
Device # ap name mymeshap mesh parent preferred dc:5f:be:f5:fd:84
```

ap name mesh security psk provisioning delete

To delete PSK-provisioned key from a mesh AP, use the **ap name mesh security psk provisioning delete** command.

ap name *ap-name* **mesh security psk provisioning delete**

Syntax Description	*ap-name* Name of the mesh AP.

Command Default	None

Command Modes	Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to delete PSK-provisioned key from a mesh AP:

```
Device# ap name mymeshap mesh security psk provisioning delete
```

ap name mesh vlan-trunking native

To configure native VLAN for mesh AP, use the **ap name mesh vlan-trunking native** command.

ap name *name-of-rap* **vlan-trunking native** *vlan-id*

Syntax Description	*name-of-rap*	Name of the root access point.
	vlan-id	VLAN ID.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to configure native VLAN for mesh AP:

```
Device # ap name mesh vlan-trunking native 12
```

ap name mode

To change a Cisco device communication option for an individual Cisco lightweight access point, use the **ap name mode** command.

ap name *ap-name* **mode** {**local submode** {**none** | **wips**} | **monitor submode** {**none** | **wips**} | **rogue** | **se-connect** | **sniffer**}

Syntax Description		
	ap-name	Name of the Cisco lightweight access point.
	local	Converts from an indoor mesh access point (MAP or RAP) to a nonmesh lightweight access point (local mode).
	submode	Specifies wIPS submode on an access point.
	none	Disables the wIPS on an access point.
	monitor	Specifies monitor mode settings.
	wips	Enables the wIPS submode on an access point.
	rogue	Enables wired rogue detector mode on an access point.
	se-connect	Enables spectrum expert mode on an access point.
	sniffer	Enables wireless sniffer mode on an access point.

Command Default   Local

Command Modes   Privileged EXEC(#)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The sniffer mode captures and forwards all the packets from the clients on that channel to a remote machine that runs AiroPeek or other supported packet analyzer software. It includes information on the timestamp, signal strength, packet size and so on.

This example shows how to set the device to communicate with access point AP01 in local mode:

```
Device# ap name AP01 mode local submode none
```

This example shows how to set the device to communicate with access point AP01 in a wired rogue access point detector mode:

```
Device# ap name AP01 mode rogue
```

This example shows how to set the device to communicate with access point AP02 in wireless sniffer mode:

```
Device# ap name AP02 mode sniffer
```

ap name mode bridge

To configure Bridge mode for an AP, use the **ap name** *ap-name* **mode bridge** command.

ap **name** *ap-name* **mode bridge**

Syntax Description

ap-name	Name of the AP.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure a Bridge mode for an AP:

```
Device# ap name my-ap mode bridge
```

ap name monitor-mode

To configure Cisco lightweight access point channel optimization, use the **ap name monitor-mode** command.

ap name *ap-name* **monitor-mode** {**no-optimization** | **tracking-opt** | **wips-optimized**}

Syntax Description		
	ap-name	Name of the Cisco lightweight access point.
	no-optimization	Specifies no channel scanning optimization for the access point.
	tracking-opt	Enables tracking optimized channel scanning for the access point.
	wips-optimized	Enables wIPS optimized channel scanning for the access point.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure a Cisco wireless intrusion prevention system (wIPS) monitor mode on access point AP01:

```
Device# ap name AP01 monitor-mode wips
```

ap name monitor-mode dot11b

To configures 802.11b scanning channels for a monitor-mode access point, use the **ap name monitor-mode dot11b** command.

ap name *ap-name* **monitor-mode dot11b fast-channel** *channel1* [*channel2*] [*channel3*] [*channel4*]

Syntax Description		
	ap-name	Name of the access point.
	fast-channel	Specifies the 2.4 GHz band scanning channel (or channels) for a monitor-mode access point.
	channel1	Scanning channel1.
	channel2	(Optional) Scanning channel2.
	channel3	(Optional) Scanning channel3.
	channel4	(Optional) Scanning channel4.

Command Default None

Command Modes Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure an access point in tracking optimized mode to listen to channels 1, 6, and 11:

```
Device# ap name AP01 monitor-mode dot11b fast-channel 1 6 11
```

ap name management-mode meraki

To change AP Management Mode to Meraki, use the **ap name management-mode meraki** command.

ap name management-mode meraki

Syntax Description	**force**	Skips the validations at the controller and attempts Meraki Management Mode change at the AP.
	noprompt	Skips the user prompt for attempting AP Management Mode change.
	cisco-ap-name	Specifies the name of the Cisco AP for Management Mode change.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was modified.

Example

This example shows how to change AP Management Mode to Meraki:

```
Device# ap name Cisco-AP-name management-mode meraki
Device# ap name Cisco-AP-name management-mode meraki force
Device# ap name Cisco-AP-name management-mode meraki noprompt
Device# ap name Cisco-AP-name management-mode meraki force noprompt
```

ap name name

To modify the name of a Cisco lightweight access point, use the **ap name name** command.

ap name *ap-name* **name** *new-name*

Syntax Description	
ap-name	Current Cisco lightweight access point name.
new-name	Desired Cisco lightweight access point name.

Command Default None

Command Modes Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to modify the name of access point AP1 to AP2:

```
Device# ap name AP1 name AP2
```

ap name network-diagnostics

To trigger network diagnostics on an OfficeExtend AP, use the **ap name network-diagnostics** command.

ap name *ap-name* **network-diagnostics**

Syntax Description

ap-name	Name of the access point.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Example

This following example shows how to trigger network diagnostics on an OfficeExtend AP.

```
Device# ap name ap18 network-diagnostic
```

ap name priority

To configure the priority of an access point, use the **ap name priority** command.

ap name *ap-name* **priority** *priority-value*

Syntax Description

priority-value	Priority value for the AP. Valid range is 1 to 4.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the priority for an access point:

```
Device# ap name my-ap priority 1
```

ap name remote

To initiate AP remote commands, use the **ap name** *ap-name* **remote** command.

ap name *ap-name* **remote** { **command** *command-name* | **disable** | **enable** }

Syntax Description	**remote command** *command-name*	Initiates the AP remote command.
	disable	Initiates the AP remote disable command.
	enable	Initiates the AP remote enable command.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History	**Release**	**Modification**
	Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Usage Guidelines   None

Example

This example shows how to initiate AP remote commands:

```
Device# terminal monitor
Device# ap name ap-name remote enable
Device# ap name ap-name remote command 'show client sum'
.
.
.
Device# ap name ap-name remote disable
```

Note   To view the output in real-time, use the **terminal monitor** command. To view the output in the controller log, use the **show logging** command.

ap name reset

To reset a specific Cisco lightweight access point, use the **ap name reset** command.

ap name *ap-name* **reset**

Syntax Description	*ap-name*	Name of the Cisco lightweight access point.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to reset a Cisco lightweight access point named AP2:

```
Device# ap name AP2 reset
```

ap name reset-button

To configure the Reset button for an access point, use the **ap name reset-button** command.

ap name *ap-name* **reset-button**

Syntax Description

ap-name	Name of the Cisco lightweight access point.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to enable the Reset button for access point AP03:

```
Device# ap name AP03 reset-button
```

ap name role

To configure the role of operation for an AP, use the **ap name role** command.

ap name *ap-name* **role** {**mesh-ap** | **root-ap**}

Syntax Description		
ap-name	Name of the AP.
mesh-ap	Configures mesh AP role for the AP.
root-ap	Configures root AP role for the AP.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the role of operation as mesh AP for an AP:

```
Device# ap name mymeshap role mesh-ap
```

ap name sensor environment

To disable the sensor admin state of the AP, use the **ap name** *cisco-ap-name* **sensor environment** command. Use the **no** form of this command to enable the sensor admin state of the AP.

ap name *cisco-ap-name* **sensor environment** { **air-quality** | **temperature** } **shutdown**

ap name *cisco-ap-name* **no sensor environment** { **air-quality** | **temperature** } **shutdown**

Syntax Description		
air-quality	Specifies the air quality sensor.
temperature	Specifies the temperature and humidity sensor.
shutdown	Shuts down the specified sensor.

Command Default   None

Command Modes   Privileged EXEC #

Command History

Release	Modification
Cisco IOS XE Cupertino 17.8.1	This command was introduced.

Example

The following example shows you how to disable the sensor admin state of the AP:

```
Device# enable
Device# ap name cisco-ap-name sensor environment temperature shutdown
```

ap name slot

To configure various slot parameters, use the **ap name slot** command. To disable a slot on a Cisco lightweight access point, use the **no** form of this command.

ap name *ap-name* **slot** *slot-number* {**channel** {**global** | **number** *channel-number* | **width** *channel-width*} | **rtsthreshold** *value* | **shutdown** | **txpower** {**global***channel-level*}}

ap name *ap-name* **no slot** {**0** | **1** | **2** | **3**} **shutdown**

Syntax Description	*ap-name*	Name of the Cisco access point.
	slot-number	Slot downlink radio to which the channel is assigned. You can specify the following slot numbers:
		• **0**—Enables slot number 0 on a Cisco lightweight access point.
		• **1**—Enables slot number 1 on a Cisco lightweight access point.
		• **2**—Enables slot number 2 on a Cisco lightweight access point.
		• **3**—Enables slot number 3 on a Cisco lightweight access point.
	channel	Specifies the channel for the slot.
	global	Specifies channel global properties for the slot.
	number	Specifies the channel number for the slot.
	channel-number	Channel number from 1 to 169.
	width	Specifies the channel width for the slot.
	channel-width	Channel width from 20 to 40.
	rtsthreshold	Specifies the RTS/CTS threshold for an access point.
	value	RTS/CTS threshold value from 0 to 65535.
	shutdown	Shuts down the slot.
	txpower	Specifies Tx power for the slot.
	global	Specifies auto-RF for the slot.
	channel-level	Transmit power level for the slot from 1 to 7.

Command Default	None
Command Modes	Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to enable slot 3 for the access point abc:

```
Device# ap name abc slot 3
```

This example shows how to configure RTS for the access point abc:

```
Device# ap name abc slot 3 rtsthreshold 54
```

ap name static-ip

To configure lightweight access point static IP settings, use the **ap name static-ip** command. To disable the Cisco lightweight access point static IP address, use the **no** form of this command.

ap name *ap-name* **static-ip** {**domain** *domain-name* | **ip-address** *ip-address* **netmask** *netmask* **gateway** *gateway* | **nameserver** *ip-address*}
ap name *ap-name* **no static-ip**

Syntax Description

ap-name	Name of the access point.
domain	Specifies the Cisco access point domain name.
domain-name	Domain to which a specific access point belongs.
ip-address	Specifies the Cisco access point static IP address.
ip-address	Cisco access point static IP address.
netmask	Specifies the Cisco access point static IP netmask.
netmask	Cisco access point static IP netmask.
gateway	Specifies the Cisco access point gateway.
gateway	IP address of the Cisco access point gateway.
nameserver	Specifies a DNS server so that a specific access point can discover the device using DNS resolution.
ip-address	IP address of the DNS server.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   An access point cannot discover the device using Domain Name System (DNS) resolution if a static IP address is configured for the access point unless you specify a DNS server and the domain to which the access point belongs.

This example shows how to configure an access point static IP address:

```
Device# ap name AP2 static-ip ip-address 192.0.2.54 netmask 255.255.255.0 gateway 192.0.2.1
```

ap name shutdown

To disable a Cisco lightweight access point, use the **ap name shutdown** command. To enable a Cisco lightweight access point, use the **no** form of this command.

ap **name** *ap-name* **shutdown**
ap **name** *ap-name* **no** **shutdown**

Syntax Description	*ap-name* Name of the Cisco lightweight access point.

Command Default	None

Command Modes	Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example how to disable a specific Cisco lightweight access point:

```
Device# ap name AP2 shutdown
```

ap name sniff

To enable sniffing on an access point, use the **ap name sniff** command. To disable sniffing on an access point, use the **no** form of this command.

ap   name   *ap-name*   **sniff**   { **dot116Ghz** | **dot11a** | **dot11b** }
ap   name   *ap-name*   **no   sniff**   { **dot11a** | **dot11b** | **dot116Ghz** }

Syntax Description		
	ap-name	Name of the Cisco lightweight access point.
	dot116Ghz	Specifies the 6-GHz band.
	dot11a	Specifies the 2.4-GHz band.
	dot11b	Specifies the 5-GHz band.
	channel	Valid channel to be sniffed. For the 5 GHz band, the range is 36 to 165. For the 2.4 GHz band, the range is 1 to 14. For dot11 6Ghz, the range is between 1 and 233.
	server-ip-address	IP address of the remote machine running Omnipeek, Airopeek, AirMagnet, or Wireshark software.

Command Default   Channel 36

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
Cisco IOS XE Cupertino 17.7.1	This command was modified to add 6-GHz.

Usage Guidelines   When the sniffer feature is enabled on an access point, it starts sniffing the signal on the given channel. It captures and forwards all the packets to the remote computer that runs Omnipeek, Airopeek, AirMagnet, or Wireshark software. It includes information about the timestamp, signal strength, packet size and so on.

Before an access point can act as a sniffer, a remote computer that runs one of the listed packet analyzers must be set up so that it can receive packets that are sent by the access point.

This example shows how to enable the sniffing on the 5 GHz band for an access point on the primary wireless LAN controller:

```
Device# ap name AP2 sniff dot11a 36 192.0.2.54
```

ap name tftp-downgrade

To configure the settings used for downgrading a lightweight access point to an autonomous access point, use the **ap name tftp-downgrade** command.

ap name *ap-name* **tftp-downgrade** *tftp-server-ip* *filename*

Syntax Description		
	ap-name	Name of the Cisco lightweight access point.
	tftp-server-ip	IP address of the TFTP server.
	filename	Filename of the access point image file on the TFTP server.

Command Default None

Command Modes Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure the settings for downgrading access point AP1:

```
Device# ap name Ap01 tftp-downgrade 172.21.12.45 ap3g1-k9w7-tar.124-25d.JA.tar
```

ap name usb-module

To enable the USB port on the access point (AP), use the **ap name** *ap-name* **usb-module**. To disable the feature, use the **no** form of this command.

ap name *ap-name* **usb-module**

no ap name *ap-name* **usb-module**

Syntax Description	**usb-module** Enables the USB port on the AP.

Command Default   None

Command Modes   Privileged EXEC mode

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.4.1	This command was introduced.

Usage Guidelines   None

Example

This example shows you how to enable the USB port on the AP:

```
Device# ap name ap-name usb-module
```

ap name vlan-tag

To configure VLAN tagging for a nonbridge AP, use the **ap name vlan-tag** command.

ap name *ap-name* **vlan-tag** *vlan-id*

Syntax Description	*ap-name*	Access point name.
	vlan-id	VLAN identifier.

Command Default	VLAN tagging is not enabled.

Command Modes	Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Example

The following example shows how to configure VLAN tagging for a nonbridge AP:

```
Device# ap name AP1 vlan-tag 12
```

ap name write tag-config

To write the existing configuration to an AP, use the **ap name write tag-config** command in privileged EXEC mode

ap name *ap-name***write tag-config**

Syntax Description	*ap-name*	Name of the access point.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines   Use this command to write the existing configuration to an AP.

Example

This example shows how to write the existing configuration to an AP:

```
Device# ap name AP40CE.2485.D594 write tag-config
```

ap name-regex

To configure filter based on AP name regular expression to match with, use the **ap name-regex** command.

ap name-regex *regular-expression*

Syntax Description	*regular-expression*	Enter the filter string.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure filter based on AP name regular expression match with:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap filter name filter--name
Device(config-ap-filter)# ap name-regex regular-expression-string
```

ap packet-capture

To start or stop the AP packet capture process, use the **ap packet-capture** command.

ap packet-capture {**start** | **stop**} *client-mac-address* {**auto** | **static** *ap-name*}

Syntax Description	
client-mac-address	Client MAC address.
ap-name	AP name.

Command Default　None

Command Modes　Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines　When using the **stop** option with **ap packet capture** command, use the keyword **all** to stop the packet capture.

Example

The following example shows how to start the AP packet capture process:

```
Device# ap packet-capture start 3c08.f672.1ad9 static AP_2029
```

The following example shows how to stop the AP packet capture process fully:

```
Device# ap packet-capture stop 3c08.f672.1ad9 all
```

ap packet-capture profile

To configure the AP packet capture profile, use the **ap packet-capture profile**command.

ap packet-capture profile *profile-name*

Syntax Description

profile-name	AP packet capture profile name.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to configure the AP packet capture profile:

```
Device# ap packet-capture profile test1
```

ap packet-capture start

To enables packet capture for the specified client on a set of nearby access points, use the **ap packet-capture start** command.

ap packet-capture start *client-mac-addr* {**auto** | **static** *ap-name*}

Syntax Description		
client-mac-addr	MAC address of the client whose packet capture has to be done.
auto	Starts packet capture in the nearby APs.
static *ap-name*	Name of the AP in which the packet capture has to be done.

Command Default	None
Command Modes	Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to enable packet capture for a client on a set of nearby access points:

```
Device# ap packet-capture start 0011.0011.0011 auto
```

ap profile

To configure access point profile, use the **ap profile** command.

ap profile *profile-name*

Syntax Description

profile-name	Enter the name of the AP profile.

Command Default

By default, the AP profile name is default-ap-profile.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure AP profile name:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap profile my-ap-profile
```

ap remote-lan profile-name

To configure remote LAN profile, use the **ap remote-lan profile-name** command.

ap remote-lan profile-name *remote-lan-profile-name rlan-id*

Syntax Description	**remote-lan-profile-name**	Is the remote LAN profile name. Range is from 1 to 32 alphanumeric characters.
	rlan-id	Is the remote LAN identifier. Range is from 1 to 128.
	Note	You can create a maximum of 128 RLANs. You cannot use the *rlan-id* of an existing RLAN while creating another RLAN.
		Both RLAN and WLAN profile cannot have the same names. Similarly, RLAN and WLAN policy profile cannot have the same names.

Command Default	None

Command Modes	Global configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure remote LAN profile:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap remote-lan profile-name rlan_profile_name 3
```

ap remote-lan shutdown

To enable or disable all RLANs, use the **ap remote-lan shutdown** command.

ap remote-lan shutdown

Command Default	None
Command Modes	Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

This example shows how to enable or disable all RLANs:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# [no] ap remote-lan shutdown
Device(config)# end
```

ap remote-lan-policy policy-name

To configure RLAN policy profile, use the **ap remote-lan-policy policy-name** command.

ap remote-lan-policy policy-name *profile-name*

Command Default	None
Command Modes	Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

This example shows how to configure RLAN policy profile:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap remote-lan-policy policy-name rlan_policy_prof_name
```

ap reset site-tag

To reboot all the APs associated to a particular site, use the **ap reset site-tag** command.

ap reset site-tag *site-tag-name*

Syntax Description	*site-tag-name*	Site tag name.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Usage Guidelines

Example

This example shows how to reboot all the APs in a particular site:

```
Device# ap reset site-tag bgl18
```

ap tag persistency enable

To configure AP tag persistency settings, use the **ap tag persistency enable** command, in the global configuration mode. To disable the AP tag persistency settings, use the **no** form of this command.

ap tag persistency enable

no ap tag persistency enable

Syntax Description	This command has no arguments or keywords.

Command Default None

Command Modes Global configuration mode

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines None

Example

The following example shows how to enable tag persistency for an AP:

```
Device(config)# ap tag persistency enable
```

ap upgrade staggered iteration completion

To configure the minimum percentage of access points (APs) that must join the destination controller to signal iteration completion, use the **ap upgrade staggered iteration completion** command.

ap upgrade staggered iteration completion *min-percent*

Syntax Description

min-percent	Percentage of APs that should join the destination controller.
	Valid values range from 0 to 100.

Command Default   Minimum percentage is not configured.

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Usage Guidelines   This command helps to configure the minimum percentage of APs that must join the destination controller to signal iteration completion. If APs are not able to join the destination controller, the upgrade is stopped. The overall percentage of missing APs must be less than the percentage configured here at the end of each iteration.

Examples   The following example shows how to configure the minimum percentage of APs that must join back to the network to signal iteration completion:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap upgrade staggered iteration completion 50
```

ap upgrade staggered iteration error

To configure the action to be taken when access points (APs) are missing after an iteration during AP upgrade, use the **ap upgrade staggered iteration error** command.

ap upgrade staggered iteration error action stop

Syntax Description	**stop** Specifies the action to be taken when APs are missing after an iteration during AP upgrade.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Usage Guidelines   This command allows you to set the action to be taken when the minimum number of APs fail to join the destination controller after an iteration cycle.

For instance, when a site is being upgraded in five iteration cycles, and the fifth one fails because of some error in the destination controller, this command helps you to stop the upgrade.

Examples   The following example shows how to configure the action to be taken when APs fail to join after an iteration during AP upgrade:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap upgrade staggered iteration error action stop
```

ap upgrade staggered iteration timeout

To configure the maximum time allowed per iteration during an access point (AP) upgrade, use the **ap upgrade staggered iteration timeout** command.

ap upgrade staggered iteration timeout *timeout-duration*

Syntax Description	*timeout-duration* Time allowed per iteration, in minutes. Valid values range from 9 to 60.

Command Default Iteration timeout is not configured.

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Usage Guidelines If an AP upgrade iteration is not completed during the specified duration, the error action that is set using the **ap upgrade staggered iteration error** command is taken.

Examples The following example shows how to configure the maximum time allowed per iteration:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap upgrade staggered iteration timeout 40
```

ap tag-source-priority

To configure ap tag source priority, use the **ap tag-source-priority** command.

ap tag-source-priority *source-priority* **source** { **filter** | **ap** }

Syntax Description	*source-priority*	Enter the ap tag source priority. Valid range is 2 to 3.
	source	Specifiy the source for which priority is been set.
	filter	AP filter as tag source.
	ap	AP as tag source.

Command Default	None

Command Modes	config

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to set AP as a tag source:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap tag-source-priority priority-value source ap
```

ap tag-sources revalidate

To revalidate the access point tag sources, use the **ap tag-sources revalidate** command.

ap tag-sources revalidate

Syntax Description

tag-sources	Tag Sources.
revalidate	Revalidate access point tag sources.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to revalidate the access point tag sources:

```
Device# ap tag-sources revalidate
```

ap triradio

To enable or disable tri-radio on all Cisco APs, use the **ap triradio** command.

ap triradio { **disable** | **enable** }

Syntax Description

ap triradio	Enables or disables tri-radio on all Cisco APs.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Example

The following example shows how to enable or disable tri-radio for all Cisco APs:

```
Device# ap triradio enable
```

ap vlan-tag

To configure VLAN tagging for all nonbridge APs, use the **ap vlan-tag** command.

ap vlan-tag *vlan-id*

Syntax Description	*vlan-id* VLAN identifier.

Command Default   VLAN tagging is not enabled for nonbridge APs.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to configure VLAN tagging for all non-bridge APs:

```
Device# ap vlan-tag 1000
```

arp-caching

To enable arp-caching, use the **arp-caching** command.

arp-caching

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

config-wireless-flex-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to enable arp-caching:

```
Device(config-wireless-flex-profile)# arp-caching
```

assisted-roaming

To configure assisted roaming using 802.11k on a WLAN, use the **assisted-roaming** command. To disable assisted roaming, use the **no** form of this command.

assisted-roaming   {**dual-list** | **neighbor-list** | **prediction**}

no assisted-roaming   {**dual-list** | **neighbor-list** | **prediction**}

Syntax Description		
	dual-list	Configures a dual band 802.11k neighbor list for a WLAN. The default is the band that the client is currently associated with.
	neighbor-list	Configures an 802.11k neighbor list for a WLAN.
	prediction	Configures assisted roaming optimization prediction for a WLAN.

Command Default   Neighbor list and dual band support are enabled by default. The default is the band that the client is currently associated with.

Command Modes   WLAN configuration

Usage Guidelines   When you enable the assisted roaming prediction list, a warning appears and load balancing is disabled for the WLAN if load balancing is already enabled on the WLAN. To make changes to the WLAN, the WLAN must be in disabled state.

Example

The following example shows how to configure a 802.11k neighbor list on a WLAN:

```
Device(config-wlan)#assisted-roaming neighbor-list
```

The following example shows the warning message when load balancing is enabled on a WLAN.
Load balancing must be disabled if it is already enabled when configuring assisted roaming:

```
Device(config)#wlan test-prediction 2 test-prediction
Device(config-wlan)#client vlan 43
Device(config-wlan)#no security wpa
Device(config-wlan)#load-balance
Device(config-wlan)#assisted-roaming prediction
WARNING: Enabling neighbor list prediction optimization may slow association and impact
VOICE client perform.
Are you sure you want to continue? (y/n)[y]: y
% Request aborted - Must first disable Load Balancing before enabling Assisted Roaming
Prediction Optimization on this WLAN.
```

association-limit

To configure maximum client associations per AP in the AP profile configuration mode, use the **association-limit** command. Use the **no** form of this command to disable the feature.

association-limit *clients-connections*

Syntax Description	*client-connections*	Configures the maximum number of client connections per AP. The default value is 0.
		Note The maximum clients per AP for Cisco Catalyst 9136 series APs is 1200 clients.

Command Default	None

Command Modes	AP configuration mode

Command History

Release	Modification
Cisco IOS XE Cupertino 17.8.1	This command was introduced.

Example

The following example shows how to configure maximum client associations per AP in the AP profile configuration mode:

```
Device# confiure terminal
Device(config)# ap profile ap-profile-name
Device(config-ap-profile)# association-limit 300
```

authentication-type

To configure the 802.11u network authentication type, use the **authentication-type** command. To remove the authentication type, use the **no** form of the command.

authentication-type { **dns-redirect** | **http-https-redirect** [*redirect-url*] | **online-enrollment** | **terms-and-conditions** [*terms*] }

Syntax Description		
dns-redirect	Sets the authentication type as DNS redirection.
http-https-redirect	Sets the authentication type as HTTP/HTTPS redirection.
redirect-url	The HTTP/HTTPS redirection URL.
online-enrollment	Sets the authentication type as online enrollment.
terms-and-conditions	Sets the authentication type as terms and conditions.
terms	Terms and conditions URL.

Command Default

None

Command Modes

Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines

If you use an authentication method, for example, Layer 3 authentication, ensure that you use the same authentication in the WLAN configuration (web authentication).

Example

The following example shows how to configure the 802.11u network authentication type:

```
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# authentication-type dns-redirect
```

autoqos

To enable Auto QoS wireless policy, use the **autoqos** command. To remove Auto QoS wireless policy, use the **no** form of this command.

autoqos mode { **enterprise-avc** | **fastlane** | **guest** | **voice** }

Syntax Description		
	enterprise-avc	Enables AutoQos wireless Enterprise policy.
	fastlane	Enable AutoQos wireless fastlane policy.
	guest	Enables AutoQos wireless guest policy
	voice	Enables AutoQos wireless voice policy

Command Default   None

Command Modes   Wireless policy configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to enable AutoQos Wireless Enterprise Policy.

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy policy-test
Device(config-wireless-policy)# autoqos mode enterprise-avc
```

avg-packet-size packetsize

To configure the wireless media-stream's average packet size, use the **avg-packet-size** command.

avg-packet-size *packetsize-value*

Syntax Description	*packetsize-value*	Average Packet Size. Valid range is 100 to 1500.

Command Default None

Command Modes media-stream

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure wireless media-stream's average packet size:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless media-stream group doc-grp 224.0.0.0 224.0.0.223
Device(config-media-stream)# avg-packet-size500
```

avc sd-service

To enable Software-Defined Application Visibility and Control (SD-AVC) service on the controller, use the **avc sd-service** command. To disable SD-AVC service on the controller, use the **no** form of this command.

avc sd-service

no avc sd-service

Syntax Description	This command has no keywords or arguments.
Command Default	SD-AVC service is disabled.
Command Modes	Global Configuration (config)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Examples

The following example shows how to enable SD-AVC service on the controller:

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# avc sd-service
```

avoid label exhaustion error

To avoid label exhaustion error happening on BGP routes during the time period when MSMR and fabric border are on two different nodes and any of those nodes is a catalyst 9300, use the **mpls label mode all-vrfs protocol all-afs per-vrf** command in global configuration mode.

awips

To enable the wireless intrusion threat detection and mitigation mechanism that is known as Advanced Wireless Intrusion Prevention System (aWIPS), use the **awips** command. To disable aWIPS, use the **no** form of the command.

awips [**forensic**]

Syntax Description	**forensic**	Enables forensics for aWIPS.

Command Default None

Command Modes AP Profile Configuration(config-ap-profile)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1	This command was introduced.
Cisco IOS XE Bengaluru 17.4.1	The **forensic** keyword was added.

Example

The following exmaple shows how to enable aWIPS and forensic.

```
Device# configure terminal
Device(config)#ap profile test
Device(config-ap-profile)#awips
Device(config-ap-profile)#awips forensic
```

awips-syslog

To configure syslog threshold for Cisco Advanced Wireless Intrusion Prevention System (aWIPS), use the **awips-syslog** command. To disable syslog threshold for aWIPS, use the **no** form of this command.

awips-syslog throttle period *value-btwn-30-600-seconds*

Syntax Description	**throttle period** *value-btwn-30-600-seconds*	Configures the syslog threshold for aWIPS.
		Note The default throttling interval is 60 seconds.

Command Default None

Command Modes Global Configuration

Command History	Release	Modification
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines

This example shows how to configure syslog threshold for aWIPS:

```
Device# configure terminal
Device(config)# awips-syslog throttle period 60
Device(config)# end
```

backhaul (mesh)

To configure mesh backhaul for a mesh AP profile, use the **backhaul** command.

backhaul rate dot11 {**24ghz** | **5ghz**} {**auto** | **dot11abg** *rate* | **dot11n mcs** *mcs-index* }

Syntax Description	**rate** Backhaul transmission rate.

rate	Backhaul transmission rate.
dot11	Specifies 802.11.
24ghz	Specifies 802.11b.
5ghz	Specifies 802.11a.
auto	Specifies method as auto.
dot11abg	Specifies method as dot11abg.
dot11n	Specifies method as dot11n.
mcs	Media convergence servers.
rate	Media convergence server rate.
mcs-index	Media convergence servers rate value for 802.11.

Command Default Backhaul client access is disabled.

Command Modes config-wireless-mesh-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to configure mesh backhaul details for a mesh AP profile:

```
Device # configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device (config)# wireless profile mesh mesh-profile
Device (config-wireless-mesh-profile)# backhaul rate dot11 24ghz auto
```

background-scanning (mesh)

To configure background scanning for a mesh AP profile, use the **background-scanning** command.

background-scanning

Syntax Description   This command has no keywords or arguments.

Command Default   Background scanning is disabled.

Command Modes   config-wireless-mesh-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to configure background scanning for a mesh AP profile:

```
Device # configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device (config)# wireless profile mesh mesh-profile
Device (config-wireless-mesh-profile)# background-scanning
```

band-select client

To configure the client threshold minimum dB for the selected band, use the **band-select client** command. To reset the client threshold minimum dB for the selected band, use the **no** form of this command.

band-select client {**mid-rssi** | **rssi** } *dBm value*

Syntax Description		
	mid-rssi	Minimum dBm of a client RSSI start to respond to probe
	rssi	Minimum dBm of a client RSSI to respond to probe
	dBm value	Minimum dBm of a client RSSI to respond to probe. Valid range is between –90 and –20 dBm.

Command Default None

Command Modes config-rf-profile

Command History	Release	Modification
	Cisco IOS XE Denali 16.3.1	This command was introduced.

Usage Guidelines This command is enabled only for 2.4-GHz band.

This example shows how to set the client threshold to minimum dB for a selected band.

```
Device(config-rf-profile)#band-select client rssi -50
```

band-select cycle

To configure the band cycle parameters, use the **band-select cycle** command. To reset the threshold value, use the **no** form of this command.

band-select cycle { **count** | **threshold** } *value*

Syntax Description	count	Sets the Band Select probe cycle count.
	value	Maximum number of cycles not responding. The range is between 1 and 10.
	threshold	Sets the time threshold for a new scanning cycle.
	value	Set the threshold value in milliseconds. The valid is between 1and 1000.

Command Default	None

Command Modes	config-rf-profile

Command History	Release	Modification
	Cisco IOS XE Denali 16.3.1	This command was introduced.

Usage Guidelines   None

This example shows how to configure the probe cycle count in an RF profile for a selected band.

```
Device(config-rf-profile)#band-select cycle count 5
```

band-select expire

To configure the expiry time for the RF profile for the selected band, use the **band-select expire** command. To reset the value, use the **no** form of this command.

band-select expire { **dual-band** | **suppression** } *value*
no band-select expire { **dual-band** | **suppression** }

Syntax Description		
	dual-band	Configures the RF Profile Band Select Expire Dual Band.
	value	Setting the time to expire for pruning previously known dual-band clients. The range is between 10 and 300.
	suppression	Configures the RF Profile Band Select Expire Suppression.
	value	Setting the time to expire for pruning previously known 802.11b/g clients. The range is between 10 and 200.

Command Default   None

Command Modes   config-rf-profile

Command History	Release	Modification
	Cisco IOS XE Denali 16.3.1	This command was introduced.

Usage Guidelines   None

This example shows how to configure the time to expire for a dual-band of an RF profile in a selected band.

```
Device(config-rf-profile)#band-select expire dual-band 15
```

band-select probe-response

To configure the probe responses to the clients for a selected band, use the **band-select probe-response** command. To disable the probe-response, use the **no** form of this command.

band-select probe-response

Syntax Description	**probe-response**	Probe responses to clients.

Command Default None

Command Modes config-rf-profile

Command History

Release	Modification
Cisco IOS XE Denali 16.3.1	This command was introduced.

Usage Guidelines None

This example shows how to enable probe response to the clients.

```
Device(config-rf-profile)#band-select probe-response
```

banner text

To configure the message in a banner, use the **banner text** command. Use the **no** form of this command to remove the message.

banner text *text*

no banner text

Syntax Description	*text*	Text message to be displayed.

Command Default None

Command Modes Parameter map configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples The following example shows how to configure a message in a banner:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# parameter-map type webauth global
Device(config-params-parameter-map)# banner text #Hêllö#
```

battery-state (mesh)

To configure battery state for an AP, use the **battery-state** command.

battery-state

Syntax Description

This command has no keywords or arguments.

Command Default

Battery state is enabled.

Command Modes

config-wireless-mesh-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to configure battery state for an AP:

```
Device # configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device (config)# wireless profile mesh mesh-profile
Device (config-wireless-mesh-profile)# battery-state
```

boot system flash

To configure boot system flash parameters, use the **boot system flash** command. To remove boot system flash parameters, use the **no** form of the command.

boot system flash   { **bootflash:** | **harddisk:** | **usb:** | **cns:** | **crashinfo:** | **flash:** | **null:** | **nvram:** | **system:** | **tar:** | **tmpsys:** | **webui:**   } *options*

Syntax Description

bootflash:	Enables directory or file name.
harddisk:	Enables directory or file name.
usb:	Enables directory or file name.
cns:	Enables directory. This URL prefix accepts no filename
crashinfo:	Enables directory or file name.
flash:	Enables directory or file name.
null:	Enables directory. This URL prefix accepts no filename
nvram:	Enables directory or file name.
system:	Enables directory or file name.
tar:	Enables directory or file name.
tmpsys:	Enables directory or file name.
webui:	Enables directory or file name.
options	System image file name.

Command Default　None

Command Modes　Global Configuration (config)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.8.1	This command was introduced.

Usage Guidelines　You can use the auto-complete feature using a few letters of the keyword and the tab key. For example, **boot system flash boot** and tab key displays **boot system flash bootflash:** command. The auto-complete feature works only for the local file system.

You can use the '?' option to display files in the system. For example, **boot system flash bootflash:?** will display all the associated files for the command.

If the file name you enter is not present locally, the following error is displayed.

```
Device(config)#boot system flash bootflash:abc.bin
%Error parsing bootflash:/abc.bin (No such file or directory)
```

Example

The following example shows how to configure boot system flash parameters:

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# boot system flash
bootflash:C9800-CL-rpboot.BLD_V178_THROTTLE_LATEST_20220111_082010.SSA.pkg
```

bridge-group

To configure bridge group parameters for a mesh AP profile, use the **bridge-group** command.

bridge-group {**name** *bridge-group-name* | **strict-match** }

Syntax Description	**name** *bridge-group-name*	Configures bridge group name.
	strict-match	Configures bridge group strict matching.

Command Default	None

Command Modes	config-wireless-mesh-profile

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the bridge group name for a mesh AP profile:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile mesh mesh-profile
Device(config-wireless-mesh-profile)# bridge-group name mesh-bridge-group
```

bss-transition

To configure BSS transition per WLAN, use the **bss-transition** command.

bss-transition   [**disassociation-imminent**]

Syntax Description	**disassociation-imminent** BSS transition disassociation Imminent per WLAN.

Command Default   None

Command Modes   config-wlan

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to configure BSS transition per WLAN:

```
Device(config-wlan)# bss-transition
```

bssid-stats bssid-stats frequency

To set the frequency timer of BSSID statistics, use the **bssid-stats bssid-stats frequency** command. To disable the timer, use the **no** form of the command.

bssid-stats bssid-stats frequency *<timer value>*

[no] bssid-stats bssid-stats frequency

Syntax Description	**bssid-stats frequency**	Sets the frequency timer of BSSID statistics in seconds.
	<1-180>	Sets the frequency value between the range of 1 to 180 seconds.

Command Default   None

Command Modes   AP profile configuration

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Example

This example shows how to set the frequency timer of BSSID statistics:

```
Device(config-ap-profile)#bssid-stats bssid-stats-frequency 100
```

bssid-neighbor-stats interval

To enable the BSSID neighbor statistics and to set the interval (in seconds) at which BSSID neighbor statistics will be sent from the AP, use the **bssid-neighbor-stats interval** command. To disable the feature, use the **no** form of the command.

bssid-neighbor-stats interval *bssid-neighbor-stats-interval*

[no] bssid-neighbor-stats interval *bssid-neighbor-stats-interval*

Syntax Description		
	bssid-neighbor-stats	Enables or disables BSSID neighbor statistics.
	interval	Sets the interval in seconds at which BSSID neighbor statistics will be send from the AP.
	bssid-neighbor-stats-interval	Specifies the interval in seconds at which BSSID neighbor statistics will be send from the AP. The value ranges from 30 to 600 seconds. The default value is 180 seconds.

Command Default   None

Command Modes   AP Profile configuration mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Example

To show the BSSID neighbor statistics interval being set in seconds:

```
Device(config-ap-profile)#bssid-neighbor-stats interval 90
```

cache timeout active value

To set the active flow monitor timeout value in seconds, use the **cache timeout active value** command.

cache timeout active *value*

Syntax Description	*value* Enter the active timeout value. Valid range is 1 to 604800.

Command Default None

Command Modes config-flow-monitor

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to set the flow monitor inactive timeout value:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# flow monitor flow-monitor-name
Device(config-flow-monitor)# cache timeout active 300
```

cache timeout inactive value

To set the flow monitor inactive timeout value in seconds, use the **cache timeout inactive value** command.

cache timeout inactive *value*

Syntax Description	*value* Enter the inactive timeout value. Valid range is 1 to 604800.

Command Default   None

Command Modes   config-flow-monitor

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to set the flow monitor inactive timeout value:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# flow monitor flow-monitor-name
Device(config-flow-monitor)# cache timeout inactive 300
```

call-snoop

call-snoop

no call-snoop

Syntax Description	This command has no keywords or arguments.

Command Default VoIP snooping is disabled by default.

Command Modes WLAN configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines You must disable the WLAN before using this command. The WLAN on which call snooping is configured must be configured with Platinum QoS. You must disable quality of service before using this command.

Example

This example shows how to enable VoIP on a WLAN:

```
Device# configure terminal
Device(config)# wireless profile policy policy-name
Device(config-wireless-policy)#service-policy input platinum-up
Device(config-wireless-policy)#service-policy output platinum
Device(config-wireless-policy)#call-snoop
Device(config-wireless-policy)#no shutdown
Device(config-wireless-policy)#end
```

calender-profile name

To map a calender profile to a policy profile, use the **calender-profile name** command.

calender-profile name *calendar-profile-name*

Syntax Description	*calendar-profile-name* Specifies the name of the calendar profile name.

Command Default None

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines

This example shows how to map a calender profile to a policy profile:

```
Device# configure terminal
Device(config)# wireless profile policy default-policy-profile
Device(config-wireless-policy)# calender-profile name daily_calendar_profile
Device(config-policy-profile-calender)# action deny-client
Device(config-policy-profile-calender)# end
```

captive-bypass-portal

To configure captive bypassing, use the **captive-bypass-portal** command.

captive-bypass-portal

Command Default None

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

This example shows how to configure captive bypassing for WLAN in LWA and CWA:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# parameter-map type webauth WLAN1_MAP
Device(config)# captive-bypass-portal
Device(config)# wlan WLAN1_NAME 4 WLAN1_NAME
Device(config-wlan)# security web-auth
Device(config-wlan)# security web-auth parameter-map WLAN1_MAP
Device(config-wlan)# end
```

capwap-discovery

To set CAPWAP discovery response method as to whether a capwap-discovery response contains the public or private IP of the controller, use the **capwap-discovery** command.

capwap-discovery{**private** | **public**}

Syntax Description		
	private	Includes private IP in CAPWAP discovery response.
	public	Includes public IP in CAPWAP discovery response.

Command Default   None

Command Modes   Management Interface Configuration(config-mgmt-interface)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines

Example

The following example shows how to configure a CAPWAP discovery response method:

```
Device# configure terminal
Device(config)# wireless management interface Vlan1
Device(config-mgmt-interface)# capwap-discovery public
```

capwap backup

To configure a primary or secondary backup device for all access points that are joined to a specific device, use the **capwap backup** command.

capwap backup {**primary** *primary-controller-name primary-controller-ip-address* | **secondary** *secondary-controller-name secondary-controller-ip-address*}

Syntax Description

primary	Specifies the primary backup device.
primary-controller-name	Primary backup device name.
primary-controller-ip-address	Primary backup device IP address.
secondary	Specifies the secondary backup device.
secondary-controller-name	Secondary backup device name.
secondary-controller-ip-address	Secondary backup device IP address.

Command Default None

Command Modes AP profile configuration (config-ap-profile)

Command History

Release	**Modification**
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure a primary backup device for all access points that are joined to a specific device:

```
Device(config)# ap profile default-ap-profile
Device(config-ap-profile)# capwap backup primary controller1 192.0.2.51
```

This example shows how to configure a secondary backup device for all access points that are joined to a specific device:

```
Device(config)# ap profile default-ap-profile
Device(config-ap-profile)# capwap backup secondary controller1 192.0.2.52
```

capwap window size

To configure AP CAPWAP control packet transmit queue size, use the **capwap window size** command. To reset the AP CAPWAP control packet transmit queue size to default level, use the **no** form of the command.

capwap window size *window-size*

| Syntax Description | *window-size* | AP CAPWAP control packet transmit queue size. |
| | | The valid range is from 1 to 50, with the default value of 1. We recommend that you limit the maximum value to 20. |

Command Default   None

Command Modes   AP profile configuration (config-ap-profile)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

The following example shows how to configure the AP CAPWAP control packet transmit queue size:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap profile default-ap-profile
Device(config-ap-profile)# capwap window size 20
```

capwap udplite

To enable IPv6 CAPWAP UDP Lite on Cisco APs, use the **capwap udplite** command.

> **Note**   You get to view the following message:
>
> This feature is supported only for IPv6 data packets, APs will be rebooted.

capwap udplite

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced.

This example shows how to enable IPv6 CAPWAP UDP Lite on Cisco APs:

```
Device# configure terminal
Device (config)# ap profile default-ap-profile
Device (config-ap-profile)# capwap udplite
Device (config-ap-profile)# end
```

ccn (mesh)

To configure channel change notification for a mesh AP profile, use the **ccn** command.

ccn

Syntax Description	This command has no keywords or arguments.

Command Default	Channel change notification is disabled.

Command Modes	config-wireless-mesh-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to configure channel change notification for a mesh AP profile:

```
Device # configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device (config)# wireless profile mesh mesh-profile
Device (config-wireless-mesh-profile)# ccn
```

ccx aironet-iesupport

To configure the support of Aironet IE CCX option, use the following command:

ccx aironet-iesupport

Syntax Description	ccx	Configures the Cisco Client Extension options.
	aironet-iesupport	Sets the support of Aironet IE on WLAN.

Command Default None

Command Modes WLAN configuration

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Example

This example shows how to configure Aironet IE support:

```
Device(config-wlan)#ccx aironet-iesupport
```

cdp

To enable the Cisco Discovery Protocol (CDP) on a Cisco lightweight access point under the AP profile, use the **cdp** command. To disable the Cisco Discovery Protocol (CDP) on a Cisco lightweight access point, use the **no** form of this command.

```
ap profile default-ap-profile
```

```
cdp
```
no cdp

Command Default	Disabled on all access points.
Command Modes	AP profile mode (config-ap-profile)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

The **no cdp** command disables CDP on all access points that are joined to the device and all access points that join in the future. CDP remains disabled on both current and future access points even after the device or access point reboots. To enable CDP, enter the **cdp** command.

Note CDP over Ethernet/radio interfaces is available only when CDP is enabled. After you enable CDP on all access points joined to the device, you can disable and then reenable CDP on individual access points using the **ap name** *Cisco-AP* **cdp** command. After you disable CDP on all access points joined to the device, you can enable and then disable CDP on individual access points.

This example shows how to enable CDP on all access points:

```
Device(config)# ap profile default-ap-profile
```

```
Device(config-ap-profile)# cdp
```

central authentication

To enable or disable central authentication, use the **central authentication** command.

central authentication

Syntax Description	This command has no keywords or arguments.

Command Default None

Command Modes config-wireless-policy

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to enable central authentication:

```
Device(config-wireless-policy)# central authentication
```

central dhcp

To enable central dhcp for locally switched clients, use the **central dhcp** command.

central dhcp

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   config-wireless-policy

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to enable central dhcp for locally switched clients:

```
Device(config-wireless-policy)# central dhcp
```

central switching

To enable or disable central switching, use the **central switching** command.

central switching

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   config-wireless-policy

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to enable or disable central switching:

```
Device(config-wireless-policy)# central switching
```

central-webauth

To configure central-webauth for an ACL, use the **central-webauth** command.

central-webauth

Syntax Description	This command has no keywords or arguments.

Command Default	None

Command Modes	config-wireless-policy

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to configure central-webauth for an ACL:

```
Device(config-wireless-policy)# central-webauth
```

chassis redundancy ha-interface

To configure the high availability (HA) interface for a chassis, use the **chassis redundancy ha-interface** command.

chassis redundancy ha-interface GigabitEthernet*interface-number* **local-ip** *ip-address netmask* **remote-ip** *remote-chassis-ip-addr*

Syntax Description	*interface-number*	GigabitEthernet interface number. Valid range is 1 to 32.
	local-ip *ip-address netmask*	Configures the IP address of the local chassis HA interface. For the netmask, enter the netmask or the prefix length in the following formats: */nn* or *A.B.C.D*.
	remote-ip *remote-chassis-ip-addr*	Configures the remote chassis IP address.

Command Default	None

Command Modes	Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the HA interface for a chassis:

```
Device# chassis ha-interface GigabitEthernet 2 local-ip 10.10.10.10 255.255.255.0 remote-ip
 10.10.10.11
```

Configuration Commands: a to f

chassis redundancy ha-interface GigabitEthernet

chassis redundancy ha-interface GigabitEthernet

To create an HA interface for your controller, use the **chassis redundancy ha-interface GigabitEthernet** command.

✎

| **Note** | This command is applicable only for Cisco Catalyst 9800 Series Wireless Controllers. |

chassis redundancy ha-interface GigabitEthernet *num*

Syntax Description

| *num* | GigabitEthernet interface number. Valid range is 1 to 32. |

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

This example shows how to create an HA interface for your controller:

```
Device# chassis redundancy ha-interface GigabitEthernet 3
```

Cisco Catalyst 9800 Series Wireless Controller Command Reference, Cisco IOS XE Cupertino 17.9.x

chassis redundancy keep-alive

To configure peer keep-alive retries and time interval before claiming peer is down, use the **chassis redundancy keep-alive** command.

chassis redundancy keep-alive { **retries** *retries* | **timer** *timer* }

retries	Chassis peer keep-alive retries before claiming peer is down.
	Valid values range from 5 to 10, enter 5 for default.
timer	Chassis peer keep-alive time interval in multiple of 100 ms.
	Valid values range from 1 to 10, enter 1 for default.

Syntax Description is the label for the above.

Command Default None

Command Modes Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure peer keep-alive retries and time interval:

```
Device# chassis redundancy keep-alive retries 6
Device# chassis redundancy keep-alive timer 6
```

chassis renumber

To renumber the local chassis id assignment, use the **chassis renumber** command.

chassis *chassis-num* **renumber** *renumber-id*

Syntax Description		
	chassis-num	Chassis number.
	renumber-id	Local chassis id.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to renumber the local chassis id assignment:

```
Device# chassis 1 renumber 1
```

chassis priority

To set the priority of the specified device, use the **chassis priority** command.

chassis *chassis-num* **priority** *priority-id*

Syntax Description	*chassis-num*	Chassis number.
	priority-id	Chassis priority.

Command Default None

Command Modes Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to set the priority of the specified device:

```
Device# chassis 1 priority 1
```

chassis transport

To enable or disable chassis transport, use the **chassis transport** command.

chassis *chassis-num* **transport** {**enable** | **disable**}

Syntax Description	*chassis-num* Chassis number.

Command Default None

Command Modes Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to enable chassis transport:

```
Device# chassis 1 transport enable
```

cisco-dna grpc

To enable gRPC channel on Cisco DNA, use the **cisco-dna grpc** command. To disable the configuration, use the no form of the command.

cisco-dna grpc

no cisco-dna grpc

Syntax Description

grpc	Enables gRPC channel on Cisco DNA.

Command Default   None

Command Modes   AP Profile configuration mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows how to enable gRPC channel on Cisco DNA :

```
Device(config-ap-profile)# cisco-dna grpc
```

class

To define a traffic classification match criteria for the specified class-map name, use the **class** command in policy-map configuration mode. Use the **no** form of this command to delete an existing class map.

class {*class-map-name* | **class-default**}
no class {*class-map-name* | **class-default**}

Syntax Description	*class-map-name*	The class map name.
	class-default	Refers to a system default class that matches unclassified packets.

Command Default	No policy map class-maps are defined.

Command Modes	Policy-map configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   Before using the **class** command, you must use the **policy-map** global configuration command to identify the policy map and enter policy-map configuration mode. After specifying a policy map, you can configure a policy for new classes or modify a policy for any existing classes in that policy map. You attach the policy map to a port by using the **service-policy** interface configuration command.

After entering the **class** command, you enter the policy-map class configuration mode. These configuration commands are available:

- **admit**—Admits a request for Call Admission Control (CAC)

- **bandwidth**—Specifies the bandwidth allocated to the class.

- **exit**—Exits the policy-map class configuration mode and returns to policy-map configuration mode.

- **no**—Returns a command to its default setting.

- **police**—Defines a policer or aggregate policer for the classified traffic. The policer specifies the bandwidth limitations and the action to take when the limits are exceeded. For more information about this command, see *Cisco IOS Quality of Service Solutions Command Reference* available on Cisco.com.

- **priority**—Assigns scheduling priority to a class of traffic belonging to a policy map.

- **queue-buffers**—Configures the queue buffer for the class.

- **queue-limit**—Specifies the maximum number of packets the queue can hold for a class policy configured in a policy map.

- **service-policy**—Configures a QoS service policy.

- **set**—Specifies a value to be assigned to the classified traffic. For more information, see set, on page 784

- **shape**—Specifies average or peak rate traffic shaping. For more information about this command, see *Cisco IOS Quality of Service Solutions Command Reference* available on Cisco.com.

To return to policy-map configuration mode, use the **exit** command. To return to privileged EXEC mode, use the **end** command.

The **class** command performs the same function as the **class-map** global configuration command. Use the **class** command when a new classification, which is not shared with any other ports, is needed. Use the **class-map** command when the map is shared among many ports.

You can configure a default class by using the **class class-default** policy-map configuration command. Unclassified traffic (traffic that does not meet the match criteria specified in the traffic classes) is treated as default traffic.

You can verify your settings by entering the **show policy-map** privileged EXEC command.

Examples

This example shows how to create a policy map called policy1. When attached to the ingress direction, it matches all the incoming traffic defined in class1, sets the IP Differentiated Services Code Point (DSCP) to 10, and polices the traffic at an average rate of 1 Mb/s and bursts at 20 KB. Traffic exceeding the profile is marked down to a DSCP value gotten from the policed-DSCP map and then sent.

```
Device(config)# policy-map policy1
Device(config-pmap)# class class1
Device(config-pmap-c)# set dscp 10
Device(config-pmap-c)# police 1000000 20000 conform-action
Device(config-pmap-c)# police 1000000 20000 exceed-action
Device(config-pmap-c)# exit
```

This example shows how to configure a default traffic class to a policy map. It also shows how the default traffic class is automatically placed at the end of policy-map pm3 even though **class-default** was configured first:

```
Device# configure terminal
Device(config)# class-map cm-3
Device(config-cmap)# match ip dscp 30
Device(config-cmap)# exit

Device(config)# class-map cm-4
Device(config-cmap)# match ip dscp 40
Device(config-cmap)# exit

Device(config)# policy-map pm3
Device(config-pmap)# class class-default
Device(config-pmap-c)# set dscp 10
Device(config-pmap-c)# exit

Device(config-pmap)# class cm-3
Device(config-pmap-c)# set dscp 4
Device(config-pmap-c)# exit

Device(config-pmap)# class cm-4
Device(config-pmap-c)# set precedence 5
Device(config-pmap-c)# exit
Device(config-pmap)# exit

Device# show policy-map pm3
Policy Map pm3
  Class cm-3
    set dscp 4
  Class cm-4
    set precedence 5
```

```
Class class-default
  set dscp af11
```

classify

To classify a rule for rogue devices, use the **classify** command.

classify {**friendly** | **malicious** | **delete**}

Syntax Description	**friendly**	Classifies devices matching this rule as friendly.
	malicious	Classifies devices matching this rule as malicious.
	delete	Devices matching this rule are ignored.

Command Default	None

Command Modes	config-rule

Command History	

Release	**Modification**
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to classify rogue devices as friendly:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless wps rogue rule my-rogue-rule priority 3
Device(config-rule)# classify friendly
```

class-map

To create a class map to be used for matching packets to the class whose name you specify and to enter class-map configuration mode, use the **class-map** command in global configuration mode. Use the **no** form of this command to delete an existing class map and to return to global or policy map configuration mode.

class-map [**match-any***type*][**match-all***type*] *class-map-name*
no   class-map [**match-any***type*][**match-all***type*] *class-map-name*

Syntax Description	**match-any**	(Optional) Performs a logical-OR of the matching statements under this class map. One or more criteria must be matched.
	type	(Optional) Configures the CPL class map.
	class-map-name	The class map name.

Command Default	No class maps are defined.

Command Modes	Global configuration
	Policy map configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
		The **type** keyword was added.

Usage Guidelines   Use this command to specify the name of the class for which you want to create or modify class-map match criteria and to enter class-map configuration mode.

The **class-map** command and its subcommands are used to define packet classification, marking, and aggregate policing as part of a globally named service policy applied on a per-port basis.

After you are in quality of service (QoS) class-map configuration mode, these configuration commands are available:

- **description**—Describes the class map (up to 200 characters). The **show class-map** privileged EXEC command displays the description and the name of the class map.

- **exit**—Exits from QoS class-map configuration mode.

- **match**—Configures classification criteria.

- **no**—Removes a match statement from a class map.

If you enter the **match-any** keyword, you can only use it to specify an extended named access control list (ACL) with the **match access-group** class-map configuration command.

To define packet classification on a physical-port basis, only one **match** command per class map is supported.

The ACL can have multiple access control entries (ACEs).

Examples

This example shows how to configure the class map called class1 with one match criterion, which is an access list called 103:

```
Device(config)# access-list 103 permit ip any any dscp 10
Device(config)# class-map class1
Device(config-cmap)# match access-group 103
Device(config-cmap)# exit
```

This example shows how to delete the class map class1:

```
Device(config)# no class-map class1
```

You can verify your settings by entering the **show class-map** privileged EXEC command.

clear aaa counters servers radius

To clear all AAA server radius or specific server radius, use the **clear aaa counters servers radius** {*server-id* | **all**}

clear aaa counters servers radius { *server-id* | **all** }

Syntax Description	*server-id*	Specifies the server IDs of the AAA servers that are displayed by the **show** command.
	all	Specifies all the AAA server IDs.

Command Default None

Command Modes Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Example

The following example shows how to clear all AAA server radius:

```
Device# clear aaa counters servers radius all
```

clear ap meraki stats

To clear Meraki AP related data, use the **clear ap meraki stats** command.

clear ap meraki stats

Syntax Description

This command has no keywords or arguments.

Command Default None

Command Modes Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

This example shows how to clear Meraki AP related data:

```
Device# clear ap meraki stats
```

clear ap sort statistics

To clear the sorted AP statistics, use the **clear ap sort statistics** command.

clear ap sort statistics

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced.

This example shows how to clear the sorted AP statistics:

```
Device# clear ap sort statistics
```

clear chassis redundancy

To clear high-availability (HA) configuration, use the **clear chassis redundancy** command.

clear chassis redundancy

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to clear HA configuration:

```
Device# clear chassis redundancy
```

clear ip nbar protocol-discovery wlan

To clear the NBAR2 protocol discovery statistics on a specific WLAN, use the **clear ip nbar protocol-discovery wlan** command.

clear ip nbar protocol-discovery wlan *wlan-name*

Syntax Description

wlan-name	Enter the WLAN name.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to clear the NBAR protocol discovery statistics on a perticular WLAN:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# clear ip nbar protocol-discovery wlan wlan-name
```

clear mdns-sd statistics

To clear mDNS statistics, use the **clear mdns-sd statistics** command.

clear mdns-sd statistics { **debug** | **glan-id** *<1 - 5>* | **rlan-id** *<1 - 128>* **wired** | **wlan-id** *<1 - 4096>* }

Syntax Description		
debug	Clears the mDNS debug statistics.
glan-id*<1 - 5>*	Clears the GLAN ID. The value range is from 1 to 5.
rlan-id*<1 - 128>*	Clears the RLAN ID. The value range is from 1 to 128.
wired	Clears the mDNS wired statistics.
wlan-id*<1 - 4096>*	Clears the WLAN ID. The value range is from 1 to 4096.

Command Default   None

Command Modes   Privileged EXEC mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows how to clear the mDNS statistics:

```
Device# clear mdns-sd statistics
```

clear platform condition all

To clear all conditional debug and packet-trace configuration and data, use the **clear platform condition all** command.

clear platform condition all

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to clear all conditional debug and packet-trace configuration and data:

```
Device# clear platform condition all
```

clear platform hardware chassis active qfp feature wireless trace-buffer ingress

To clear QFP wireless ingress packet filtered trace and global trace, use the **clear platform hardware chassis active qfp feature wireless trace-buffer ingress** command.

clear platform hardware chassis active qfp feature wireless trace-buffer ingress { **all** | **conditions** | **filtered-trace** | **global-trace** }

Syntax Description		
all	Clears conditions, global trace buffer, and filtered-trace buffer.
conditions	Clears all filtered-trace conditions.
filtered-trace	Clears filtered trace buffer.
global-trace	Clears global trace buffer.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Example

The following example shows you how to clear QFP wireless ingress packet filtered trace:

```
Device# clear platform hardware chassis active qfp feature wireless trace-buffer ingress
all
```

clear platform hardware chassis active qfp feature wireless trace-buffer punt-inject

To clear QFP wireless punt-inject filtered trace and global trace, use the **clear platform hardware chassis active qfp feature wireless trace-buffer punt-inject** command.

clear platform hardware chassis active qfp feature wireless trace-buffer punt-inject { **all** | **conditions** | **filtered-trace** | **global-trace** }

Syntax Description		
	all	Clears conditions, global trace buffer, and filtered-trace buffer.
	conditions	Clears all filtered-trace conditions.
	filtered-trace	Clears filtered trace buffer.
	global-trace	Clears global trace buffer.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Example

The following example shows you how to clear QFP wireless punt inject packet filtered trace:

```
Device# clear platform hardware chassis active qfp feature wireless punt-inject all
```

clear platform software rif-mgr chassis active R0 clear-lmp-counters

To clear the control message statistics in an active instance, use the **clear platform software rif-mgr chassis active R0 clear-lmp-counters** command.

clear platform software rif-mgr chassis active R0 clear-lmp-counters

Syntax Description

rif-mgr	Displays information about the RIF manager.
chassis	Displays information about the chassis.
active	Specifies the Active instance.
R0	Specifies the Route-Processor slot 0.
clear-lmp-counters	Clears the LMP statistics.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Example

The following example shows how to clear the control message statistics in an active instance:

```
Device# clear platform software rif-mgr chassis active R0 clear-lmp-counters
```

clear platform software rif-mgr chassis standby R0 clear-lmp-counters

To clear the control message statistics in a standby instance, use the **clear platform software rif-mgr chassis standby R0 clear-lmp-counters** command.

clear platform software rif-mgr chassis standby R0 clear-lmp-counters

Syntax Description		
	rif-mgr	Displays information about the RIF manager.
	chassis	Displays information about the chassis.
	standby	Specifies the Standby instance.
	R0	Specifies the Route-Processor slot 0.
	clear-lmp-counters	Clears the LMP statistics.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Example

The following example shows how to clear the control message statistics in a standby instance:

```
Device# clear platform software rif-mgr chassis standby R0 clear-lmp-counters
```

clear radius statistics

To clear the radius server information statistics, use the **clear radius statistics** command.

clear radius statistics

Syntax Description   There are no arguments for this command.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Example

The following example shows how to clear the radius server information statistics:

```
Device# clear radius statistics
```

clear subscriber policy peer

To clear the display of the details of a subscriber policy peer connection, use the **clear subscriber policy peer**command in privileged EXEC mode.

clear subscriber policy peer {**address** *ip-address* | **handle** *connection-handle-id* | **session** | **all**}

Syntax Description		
address	Clears the display of a specific peer connection, identified by its IP address.
ip-address	IP address of the peer connection to be cleared.
handle	Clears the display of a specific peer connection, identified by its handle.
connection-handle-id	Handle ID for the peer connection handle.
session	Clears the display of sessions with the given peer.
all	Clears the display of all peer connections.

Command Modes
Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SRC	This command was introduced.
12.2(33)SB	This command was integrated into Cisco IOS Release 12.2(33)SB

Usage Guidelines
The **clear subscriber policy peer** command ends the peering relationship between the Intelligent Services Gateway (ISG) device and selected Service Control Engine (SCE) devices. However, the SCE will attempt to reconnect with the ISG device after a configured amount of time. The **clear subscriber policy peer** command can remove select session associations from a particular SCE device.

Examples
The following example shows how the **clear subscriber policy peer**command is used at the router prompt to clear the display of all details of the subscriber policy peer connection.

```
Router# clear subscriber policy peer all
```

Related Commands

Command	Description
show subscriber-policy peer	Displays the details of a subscriber policy peer.
subscriber-policy	Defines or modifies the forward and filter decisions of the subscriber policy.

clear wireless stats mobility

To clear the event and message level statistics, use the **clear wireless stats mobility** command.

clear wireless stats mobility

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Usage Guidelines

This example shows how to clear the event and message level statistics:

```
Device# clear wireless stats mobility
```

clear wireless stats mobility peer ip

To clear the control and data link flap counters associated with a peer, use the **clear wireless stats mobility peer ip** command.

clear wireless stats mobility peer ip *ip-address*

Syntax Description

ip-address	IP address of the remote peer.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Usage Guidelines

This example shows how to clear the control and data link flap counters associated with a peer:

```
Device# clear wireless stats mobility peer ip 192.0.2.51
```

clear wireless wps rogue ap

To clear all rogue APs or rogue APs with specific MAC addresses, use the **clear wireless wps rogue ap** command.

clear wireless wps rogue ap { **all** | **mac-address** *<MAC Address>* }

Syntax Description	
all	Clears all the rogue APs.
mac-address *<MAC Address>*	Clears the rogue APs with specific MAC addresses.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 16.12.1	This command was introduced.

Usage Guidelines None

Example

The following example shows you how to clear all rogue APs or rogue APs with specific MAC addresses:

```
Device# clear wireless wps rogue ap all
Device# clear wireless wps rogue ap mac-address 10.10.1
```

clear wireless wps rogue client

To clear all rogue clients or client with specific MAC addresses, use the **clear wireless wps rogue client** command.

clear wireless wps rogue client { **all** | **mac-address** *<MAC Address>* }

Syntax Description	**all** Clears all the rogue clients.
	mac-address *<MAC Address>* Clears the rogue clients with specific MAC addresses.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 16.12.1	This command was introduced.

Usage Guidelines None

Example

The following example shows you how to clear all rogue clients or rogue clients with specific MAC addresses:

```
Device# clear wireless wps rogue client all
Device# clear wireless wps rogue client mac-address 10.10.1
```

clear wireless wps rogue stats

To clear rogue statistics, use the **clear wireless wps rogue stats** command.

clear wireless wps rogue stats

Syntax Description   This command has no arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 16.12.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to clear rogue statistics:

```
Device# clear wireless wps rogue stats
```

clear wlan sort statistics

To clear the sorted WLAN statistics, use the **clear wlan sort statistics** command.

clear wlan sort statistics

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced.

This example shows how to clear the sorted WLAN statistics:

```
Device# clear wlan sort statistics
```

client-access (mesh)

To configure backhaul with client access AP for a mesh AP profile, use the **client-access** command.

client-access

Syntax Description	This command has no keywords or arguments.

Command Default Backhaul client access is disabled.

Command Modes config-wireless-mesh-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to configure backhaul with client access AP for a mesh AP profile:

```
Device # configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device (config)# wireless profile mesh mesh-profile
Device (config-wireless-mesh-profile)# client-access
```

client association limit

To configure the maximum number of client connections on a WLAN, use the **client association limit** command. To disable clients association limit on the WLAN, use the **no** form of this command.

client association limit {*association-limit*}
no client association limit {*association-limit*}

Syntax Description	*association-limit*	Number of client connections to be accepted. The range is from 0 to . A value of zero (0) indicates no set limit.

Command Default
The maximum number of client connections is set to 0 (no limit).

Command Modes
WLAN configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines
You must disable the WLAN before using this command. See Related Commands section for more information on how to disable a WLAN.

This example shows how to configure a client association limit on a WLAN and configure the client limit to 200:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wlan wlan1
Device(config-wlan)# shutdown
Device(config-wlan)# client association limit 200
Device(config-wlan)# no shutdown
Device(config-wlan)# end
```

This example shows how to disable a client association limit on a WLAN:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wlan wlan1
Device(config-wlan)# shutdown
Device(config-wlan)# no client association limit
Device(config-wlan)# no shutdown
Device(config-wlan)# end
```

This example shows how to configure a client association limit per radio on a WLAN and configure the client limit to 200:

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# wlan wlan1
Device(config-wlan)# client association limit radio 200
Device(config-wlan)# no shutdown
Device(config-wlan)# end
```

This example shows how to configure a client association limit per AP on a WLAN and configure the client limit to 300::

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# wlan wlan1
Device(config-wlan)# client association limit ap 300
Device(config-wlan)# no shutdown
Device(config-wlan)# end
```

client-aware-fra

To configure the client aware Flexible Radio Assignment (FRA) , use the **client-aware-fra** {**client-count-reset** *client-count* | **client-reset-util** *util-percentage*} command in the RF profile configuration mode.

Use the no form of the **client-reset-util** command to disable the feature.

client-aware-fra { **client-count-reset** *client-count* | **client-reset-util** *util-percentage* }

no client-aware-fra client-reset-util *util-percentage*

Syntax Description	**client-count-reset**	Configures the client count threshold for radio to switch from 6-GHz to 5-GHz.
	client-count	Specifies the 6-GHz client count. The value range is from 1 and 10 clients.
	client-reset-util	Configures the utilization threshold for radio to switch from 6-GHz to 5-GHz.
	util-percentage	Specifies the utilization percentage. The value range is from 0 to 100 percent.

Command Default	None
Command Modes	RF Profile Configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

This example shows how to configure the client aware Flexible Radio Assignment (FRA):

```
Device(config)# ap dot11 6ghz rf-profile rf-profile-name
Device(conf-rf-profile)# client-aware-fra client-count-reset 1
Device(conf-rf-profile)# client-aware-fra client-reset-util 5
```

channel foreign

To configure the RF Profile DCA foreign AP contribution, use the **channel foreign** command. To disable the DCA Foreign AP Contribution, use the **no** form of this command.

channel foreign

Syntax Description	foreign	Configures the RF Profile DCA foreign AP contribution.

Command Default None

Command Modes config-rf-profile

Command History

Release	Modification
Cisco IOS XE Denali 16.3.1	This command was introduced.

Usage Guidelines None

This example shows how to configure the RF profile DCA foreign AP contribution.

```
Device(config-rf-profile)#channel foreign
```

channel chan-width

To configure the RF profile DCA channel width, use the **channel chan-width** command.

channel chan-width {**160** | **20** | **40** | **80** | **80+80** | **best**}

Syntax Description

160	160 MHz.
20	20 MHz.
40	40 MHz.
80	80 MHz.
80+80	80+80 MHz.
best	Best channel width.

Command Default   None

Command Modes   RF Profile Configuration (config-rf-profile)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines

Example

The following example shows how to configure the RF profile DCA channel width.

```
Device(config-rf-profile)# channel chan-width 160
```

channel psc

To enable or disable the preferred scanning channel (PSC) bias for DCA, use the **channel psc** command, in the RF configuration mode. Use the **no** form of this command to disable this feature.

channel psc

no channel psc

Syntax Description	This command has no arguments or keywords.

Command Default	None

Command Modes	RF configuration mode

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Example

The following example shows how to enable or disable the preferred scanning channel (PSC) bias for DCA:

```
Device(config)# ap dot11 6ghz rf-profile rf-profile-name
Device(config-rf-profile)# channel psc
```

client-l2-vnid

To configure the client l2-vnid on a wireless fabric profile, use the **client-l2-vnid** command.

client-l2-vnid *vnid*

Syntax Description	*vnid* Configures client l2-vnid. Valid range is 0 to 16777215.

Command Default	None

Command Modes	config-wireless-fabric

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the client l2-vnid value on a wireless fabirc profile:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile fabric fabric-profile-name
Device(config-wireless-fabric)# client-l2-vnid 10
```

client-steering

To configure 6-GHz client steering on the WLAN, use the **client-steering** command. Use the **no** form of this command to disable this feature.

client-steering

no client-steering

Syntax Description	This command has no arguments or keywords.

Command Default None

Command Modes WLAN configuration mode

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Example

This example shows how to configure 6-GHz client steering on WLAN:

```
Device # configure terminal
Device (config)# wlan wlan-name 18 ssid-name
Device (config-wlan)# client-steering
```

collect counter

To configure the number of bytes or packets in a flow as a non-key field for a flow record, use the **collect counter** command in flow record configuration mode. To disable the use of the number of bytes or packets in a flow (counters) as a non-key field for a flow record, use the **no** form of this command.

Command Default
The number of bytes or packets in a flow is not configured as a non-key field.

Command Modes
Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines
To return this command to its default settings, use the **no collect counter** or **default collect counter** flow record configuration command.

The following example configures the total number of bytes in the flows as a non-key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)#collect counter bytes long
```

The following example configures the total number of packets from the flows as a non-key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# collect counter packets long
```

collect wireless ap mac address (wireless)

To enable the collection of MAC addresses of the access points that the wireless client is associated with, use the **collect wireless ap mac address** command in the flow record configuration mode. To disable the collection of access point MAC addresses, use the **no** form of this command.

collect wireless ap mac address
no collect wirelessap mac address

Syntax Description	This command has no arguments or keywords.
Command Default	The collection of access point MAC addresses is not enabled by default.
Command Modes	Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

The Flexible NetFlow **collect** commands are used to configure non-key fields for the flow monitor record and to enable capturing the values in the fields for the flow created with the record. The values in non-key fields are added to flows to provide additional information about the traffic in the flows. A change in the value of a non-key field does not create a new flow. In most cases, the values for non-key fields are taken from only the first packet in the flow.

The following example configures the flow record to enable the collection of MAC addresses of the access points that the wireless client is associated with:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# collect wireless ap mac address
```

collect wireless client mac address (wireless)

To enable the collection of MAC addresses of the wireless clients that the access point is associated with, use the **collect wireless client mac address** command in the flow record configuration mode. To disable the collection of access point MAC addresses, use the **no** form of this command.

collect wirelessclient mac address
no collect wireless client mac address

Syntax Description	This command has no arguments or keywords.
Command Default	The collection of wireless client MAC addresses is not enabled by default.
Command Modes	Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

The Flexible NetFlow **collect** commands are used to configure non-key fields for the flow monitor record and to enable capturing the values in the fields for the flow created with the record. The values in non-key fields are added to flows to provide additional information about the traffic in the flows. A change in the value of a non-key field does not create a new flow. In most cases, the values for non-key fields are taken from only the first packet in the flow.

The following example configures the flow record to enable the collection of MAC addresses of the access points that the wireless client is associated with:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# collect wireless client mac address
```

connection-capability

To configure a Hotspot 2.0 connection capability, use the **connection-capability** command. To remove the Hotspot 2.0 connection capability, use the **no** form of the command.

connection-capability *ip-protocol port-number* { **closed** | **open** | **unknown** }

Syntax Description		
	ip-protocol	IP number. Valid range is from 0-255.
	port-number	Port number. Valid range is from 0-65535.
	closed	Indicates that connection is closed mode.
	open	Indicates that connection is open mode.
	unknown	Indicates that connection status is unknown.

Command Default   None

Command Modes   Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines   The following table lists the pre-defined open ports and protocols.

Table 7: Open Ports and Protocols

IP Protocol	Port Number	Description
1	0	ICMP. Used for diagnostics.
6	20	FTP
6	22	SSH
6	80	HTTP
6	443	Used by HTTPS and TLS VPNs.
6	1723	Used by Point to Point Tunneling Protocol VPNs.
6	5060	VoIP
17	500	Used by IKEv2 (IPsec VPN).
17	5060	VoIP
17	4500	May be used by IKEv2 (IPsec VPN).

IP Protocol	Port Number	Description
50	0	ESP. Used by IPsec VPNs.

Example

The following example shows how to configure Hotspot 2.0 connection capability:

```
Device(config)#wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# connection-capability 12 655 open
```

console

To enable an AP serial console port, use the **console** command in the AP profile configuration. Use the **no** form of this command to disable the feature.

console

no console

Syntax Description	This command has no keywords or arguments.

Command Default	None

Command Modes	AP Profile Configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

This example shows how to enable an AP serial console port:

```
Device(config)# ap profile ap-profile-name
Device(config-ap-profile)# console
```

controller

To enter SD service controller connectivity parameter configuration mode, use the **controller** command. To exit SD service controller configuration mode, use the **exit** command.

controller

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   SD Service Configuration (config-sd-service)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Examples   The following example shows how to enable SD service controller connectivity parameter configuration mode:

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# avc sd-service
Device(config-sd-service)# controller
```

convergence

To configure mesh convergence method, use the **convergence** command.

convergence { **fast** | **noise-tolerant-fast** | **standard** | **very-fast** }

Syntax Description	**fast**	Configures fast convergence method.
	noise-tolerant-fast	Configures noise-tolerant fast convergence method method to handle unstable RF environment.
	standard	Configures standard convergence method.
	very-fast	Configures very fast convergence method.

Command Default	Standard

Command Modes	config-wireless-mesh-profile

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the fast convergence method for a mesh AP profile:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile mesh mesh-profile
Device(config-wireless-mesh-profile)# convergence fast
```

copy configuration download

To download a workgroup bridge (WGB) configuration file from the SFTP or TFTP server, use the **copy configuration download** command.

copy configuration download { **sftp:** | **tftp:** } *ip-address* [*directory*] [*file-name*]

Syntax Description		
sftp:	Selects SFTP server.	
tftp:	Selects TFTP server.	
ip-address	IP address of the SFTP or TFTP server that you want to use.	
directory	(Optional) Directory name to use in the SFTP or TFTP server.	
file-name	(Optional) WGB configuration file name.	

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.8.1	This command was introduced.

Usage Guidelines   You can enter this command on the AP console only if the AP is in the WGB mode.

Examples   The following example shows how to select a WGB configuration file from the SFTP server:

```
Device# copy configuration download sftp: 10.10.10.1 C:sample.txt
```

copy configuration upload

To create a workgroup bridge (WGB) configuration file and upload it to the SFTP or TFTP server, use the **copy configuration upload** command.

copy configuration upload { **sftp:** | **tftp:** } *ip-address* [*directory*]   [*file-name*]

Syntax Description		
sftp:	Selects SFTP server.	
tftp:	Selects TFTP server.	
ip-address	IP address of the SFTP or TFTP server that you want to use.	
directory	(Optional) Directory name to use in the SFTP or TFTP server.	
file-name	(Optional) WGB configuration file name.	

Command Default   None

Command Modes   Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Cupertino 17.8.1	This command was introduced.

Usage Guidelines   You can enter this command on the AP console only if the AP is in the WGB mode.

Examples   The following example shows how to create a WGB configuration file and upload it to the SFTP server:

```
Device# copy configuration upload sftp: 10.10.10.1 C:sample.txt
```

coverage

To configure the voice and data coverage, use the **coverage** command. To reset the minimum RSSI value use the **no** form of this command.

coverage {**data** | **voice**} **rssi threshold** *value*

Syntax Description	data	Configure Coverage Hole Detection for data packets.
	voice	Configure Coverage Hole Detection for voice packets.
	value	Minimum RSSI value for the packets received by the access point. The valid rage is between –90 and –60 dBm.

Command Default	None

Command Modes	config-rf-profile

Command History	**Release**	**Modification**
	Cisco IOS XE Denali 16.3.1	This command was introduced.

Usage Guidelines	None

This example shows how to configure the coverage hole detection for data packets.

```
Device(config-rf-profile)#coverage data rssi threshold –85
```

crypto key generate rsa

To generate Rivest, Shamir, and Adelman (RSA) key pairs, use the **crypto key generate rsa** commandinglobal configuration mode.

crypto key generate rsa [**general-keys** | **usage-keys** | **signature** | **encryption**] [**label** *key-label*] [**exportable**] [**modulus** *modulus-size*] [**storage** *devicename* **:**] [**redundancy**] [**on** *devicename* **:**]

Syntax Description

general-keys	(Optional) Specifies that a general-purpose key pair will be generated, which is the default.
usage-keys	(Optional) Specifies that two RSA special-usage key pairs, one encryption pair and one signature pair, will be generated.
signature	(Optional) Specifies that the RSA public key generated will be a signature special usage key.
encryption	(Optional) Specifies that the RSA public key generated will be an encryption special usage key.
label *key-label*	(Optional) Specifies the name that is used for an RSA key pair when they are being exported.
	If a key label is not specified, the fully qualified domain name (FQDN) of the router is used.
exportable	(Optional) Specifies that the RSA key pair can be exported to another Cisco device, such as a router.
modulus *modulus-size*	(Optional) Specifies the IP size of the key modulus.
	By default, the modulus of a certification authority (CA) key is 1024 bits. The recommended modulus for a CA key is 2048 bits. The range of a CA key modulus is from 350 to 4096 bits.
	Note Effective with Cisco IOS XE Release 2.4 and Cisco IOS Release 15.1(1)T, the maximum key size was expanded to 4096 bits for private key operations. The maximum for private key operations prior to these releases was 2048 bits.
storage *devicename* **:**	(Optional) Specifies the key storage location. The name of the storage device is followed by a colon (:).
redundancy	(Optional) Specifies that the key should be synchronized to the standby CA.
on *devicename* **:**	(Optional) Specifies that the RSA key pair will be created on the specified device, including a Universal Serial Bus (USB) token, local disk, or NVRAM. The name of the device is followed by a colon (:).
	Keys created on a USB token must be 2048 bits or less.

Command Default   RSA key pairs do not exist.

Command Modes

Global configuration (config)

From Cisco IOS XE Release 17.11.1a, the command mode is Privileged EXEC (#)

Command History

Release	Modification
11.3	This command was introduced.
12.2(8)T	The *key-label* argumentwas added.
12.2(15)T	The **exportable** keyword was added.
12.2(18)SXD	This command was integrated into Cisco IOS Release 12.2(18)SXD.
12.4(4)T	The **storage** keyword and *devicename* **:** argument were added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.4(11)T	The **storage** keyword and *devicename* **:** argument were implemented on the Cisco 7200VXR NPE-G2 platform.
	The **signature**, **encryption** and **on** keywords and *devicename* **:** argument were added.
12.4(24)T	Support for IPv6 Secure Neighbor Discovery (SeND) was added.
XE 2.4	The maximum RSA key size was expanded from 2048 to 4096 bits for private key operations.
15.0(1)M	This command was modified. The **redundancy** keyword was introduced.
15.1(1)T	This command was modified. The range value for the **modulus** keyword value is extended from 360 to 2048 bits to 360 to 4096 bits.
15.2(2)SA2	This command was implemented on the Cisco ME 2600X Series Ethernet Access Switches.
Cisco IOS XE Release 17.11.1a	The default command mode for this command has changed from Global configuration (config) to Privileged EXEC (#).

Usage Guidelines

> **Note**
>
> Security threats, as well as the cryptographic technologies to help protect against them, are constantly changing. For more information about the latest Cisco cryptographic recommendations, see the Next Generation Encryption (NGE) white paper.

Use this command to generate RSA key pairs for your Cisco device (such as a router).

RSA keys are generated in pairs--one public RSA key and one private RSA key.

If your router already has RSA keys when you issue this command, you will be warned and prompted to replace the existing keys with new keys.

> **Note** Before issuing this command, ensure that your router has a hostname and IP domain name configured (with the **hostname** and **ip domain-name** commands). You will be unable to complete the **crypto key generate rsa** command without a hostname and IP domain name. (This situation is not true when you generate only a named key pair.)

> **Note** Secure Shell (SSH) may generate an additional RSA key pair if you generate a key pair on a router having no RSA keys. The additional key pair is used only by SSH and will have a name such as {*router_FQDN*}.server. For example, if a router name is "router1.cisco.com," the key name is "router1.cisco.com.server."

This command is not saved in the router configuration; however, the RSA keys generated by this command are saved in the private configuration in NVRAM (which is never displayed to the user or backed up to another device) the next time the configuration is written to NVRAM.

> **Note** If the configuration is not saved to NVRAM, the generated keys are lost on the next reload of the router.

There are two mutually exclusive types of RSA key pairs: special-usage keys and general-purpose keys. When you generate RSA key pairs, you will be prompted to select either special-usage keys or general-purpose keys.

Special-Usage Keys

If you generate special-usage keys, two pairs of RSA keys will be generated. One pair will be used with any Internet Key Exchange (IKE) policy that specifies RSA signatures as the authentication method, and the other pair will be used with any IKE policy that specifies RSA encrypted keys as the authentication method.

A CA is used only with IKE policies specifying RSA signatures, not with IKE policies specifying RSA-encrypted nonces. (However, you could specify more than one IKE policy and have RSA signatures specified in one policy and RSA-encrypted nonces in another policy.)

If you plan to have both types of RSA authentication methods in your IKE policies, you may prefer to generate special-usage keys. With special-usage keys, each key is not unnecessarily exposed. (Without special-usage keys, one key is used for both authentication methods, increasing the exposure of that key.)

General-Purpose Keys

If you generate general-purpose keys, only one pair of RSA keys will be generated. This pair will be used with IKE policies specifying either RSA signatures or RSA encrypted keys. Therefore, a general-purpose key pair might get used more frequently than a special-usage key pair.

Named Key Pairs

If you generate a named key pair using the *key-label* argument, you must also specify the **usage-keys** keyword or the **general-keys** keyword. Named key pairs allow you to have multiple RSA key pairs, enabling the Cisco IOS software to maintain a different key pair for each identity certificate.

Modulus Length

When you generate RSA keys, you will be prompted to enter a modulus length. The longer the modulus, the stronger the security. However a longer modules takes longer to generate (see the table below for sample times) and takes longer to use.

Table 8: Sample Times by Modulus Length to Generate RSA Keys

Router	360 bits	512 bits	1024 bits	2048 bits (maximum)
Cisco 2500	11 seconds	20 seconds	4 minutes, 38 seconds	More than 1 hour
Cisco 4700	Less than 1 second	1 second	4 seconds	50 seconds

Cisco IOS software does not support a modulus greater than 4096 bits. A length of less than 512 bits is normally not recommended. In certain situations, the shorter modulus may not function properly with IKE, so we recommend using a minimum modulus of 2048 bits.

Note As of Cisco IOS Release 12.4(11)T, peer *public* RSA key modulus values up to 4096 bits are automatically supported. The largest private RSA key modulus is 4096 bits. Therefore, the largest RSA private key a router may generate or import is 4096 bits. However, RFC 2409 restricts the private key size to 2048 bits or less for RSA encryption. The recommended modulus for a CA is 2048 bits; the recommended modulus for a client is 2048 bits.

Additional limitations may apply when RSA keys are generated by cryptographic hardware. For example, when RSA keys are generated by the Cisco VPN Services Port Adapter (VSPA), the RSA key modulus must be a minimum of 384 bits and must be a multiple of 64.

Specifying a Storage Location for RSA Keys

When you issue the **crypto key generate rsa** command with the **storage** *devicename* **:** keyword and argument, the RSA keys will be stored on the specified device. This location will supersede any **crypto key storage** command settings.

Specifying a Device for RSA Key Generation

As of Cisco IOS Release 12.4(11)T and later releases, you may specify the device where RSA keys are generated. Devices supported include NVRAM, local disks, and USB tokens. If your router has a USB token configured and available, the USB token can be used as cryptographic device in addition to a storage device. Using a USB token as a cryptographic device allows RSA operations such as key generation, signing, and authentication of credentials to be performed on the token. The private key never leaves the USB token and is not exportable. The public key is exportable.

RSA keys may be generated on a configured and available USB token, by the use of the **on** *devicename* **:** keyword and argument. Keys that reside on a USB token are saved to persistent token storage when they are generated. The number of keys that can be generated on a USB token is limited by the space available. If you attempt to generate keys on a USB token and it is full you will receive the following message:

```
% Error in generating keys:no available resources
```

Key deletion will remove the keys stored on the token from persistent storage immediately. (Keys that do not reside on a token are saved to or deleted from nontoken storage locations when the **copy**or similar command is issued.)

For information on configuring a USB token, see " Storing PKI Credentials " chapter in the Cisco IOS Security Configuration Guide, Release 12.4T. For information on using on-token RSA credentials, see the " Configuring and Managing a Cisco IOS Certificate Server for PKI Deployment " chapter in the Cisco IOS Security Configuration Guide , Release 12.4T.

Specifying RSA Key Redundancy Generation on a Device

You can specify redundancy for existing keys only if they are exportable.

Examples

The following example generates a general-usage 1024-bit RSA key pair on a USB token with the label "ms2" with crypto engine debugging messages shown:

```
Router(config)# crypto key generate rsa label ms2 modulus 2048 on usbtoken0:
The name for the keys will be: ms2
% The key modulus size is 2048 bits
% Generating 1024 bit RSA keys, keys will be on-token, non-exportable...
Jan 7 02:41:40.895: crypto_engine: Generate public/private keypair [OK]
Jan 7 02:44:09.623: crypto_engine: Create signature
Jan 7 02:44:10.467: crypto_engine: Verify signature
Jan 7 02:44:10.467: CryptoEngine0: CRYPTO_ISA_RSA_CREATE_PUBKEY(hw)(ipsec)
Jan 7 02:44:10.467: CryptoEngine0: CRYPTO_ISA_RSA_PUB_DECRYPT(hw)(ipsec)
```

Now, the on-token keys labeled "ms2" may be used for enrollment.

The following example generates special-usage RSA keys:

```
Router(config)# crypto key generate rsa usage-keys
The name for the keys will be: myrouter.example.com
Choose the size of the key modulus in the range of 360 to 2048 for your Signature Keys.
Choosing a key modulus greater than 512 may take a few minutes.
How many bits in the modulus[512]? <return>
Generating RSA keys.... [OK].
Choose the size of the key modulus in the range of 360 to 2048 for your Encryption Keys.
Choosing a key modulus greater than 512 may take a few minutes.
How many bits in the modulus[512]? <return>
Generating RSA keys.... [OK].
```

The following example generates general-purpose RSA keys:

Note You cannot generate both special-usage and general-purpose keys; you can generate only one or the other.

```
Router(config)# crypto key generate rsa general-keys
The name for the keys will be: myrouter.example.com
Choose the size of the key modulus in the range of 360 to 2048 for your General Purpose
Keys. Choosing a key modulus greater than 512 may take a few minutes.
How many bits in the modulus[512]? <return>
Generating RSA keys.... [OK].
```

The following example generates the general-purpose RSA key pair "exampleCAkeys":

```
crypto key generate rsa general-keys label exampleCAkeys
crypto ca trustpoint exampleCAkeys
 enroll url
http://exampleCAkeys/certsrv/mscep/mscep.dll
 rsakeypair exampleCAkeys 1024 1024
```

The following example specifies the RSA key storage location of "usbtoken0:" for "tokenkey1":

crypto key generate rsa general-keys label tokenkey1 storage usbtoken0:

The following example specifies the **redundancy** keyword:

```
Router(config)# crypto key generate rsa label MYKEYS redundancy
```

The name for the keys will be: MYKEYS

Choose the size of the key modulus in the range of 360 to 2048 for your

General Purpose Keys. Choosing a key modulus greater than 512 may take

a few minutes.

How many bits in the modulus [512]:

% Generating 512 bit RSA keys, keys will be non-exportable with redundancy...[OK]

	Command	Description
Related Commands	copy	Copies any file from a source to a destination, use the copy command in privileged EXEC mode.
	crypto key storage	Sets the default storage location for RSA key pairs.
	debug crypto engine	Displays debug messages about crypto engines.
	hostname	Specifies or modifies the hostname for the network server.
	ip domain-name	Defines a default domain name to complete unqualified hostnames (names without a dotted-decimal domain name).
	show crypto key mypubkey rsa	Displays the RSA public keys of your router.
	show crypto pki certificates	Displays information about your PKI certificate, certification authority, and any registration authority certificates.

crypto pki trustpoint

To create a new TrustPoint dedicated for a single CA certificate, use the **crypto pki trustpoint** command.

crypto pki trustpoint

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Usage Guidelines

This example shows how to create a new TrustPoint dedicated for a single CA certificate:

```
Device# configure terminal
Device(config)# crypto pki trustpoint <tp_name>
Device(ca-trustpoint)# enrollment terminal
Device(ca-trustpoint)# exit
Device(config)# crypto pki authenticate <tp_name>
<<< PASTE CA-CERT in PEM format followed by quit >>>
```

crypto pki trust pool import terminal

To import the root certificate by pasting the CA certificate from the **digicert.com**, use the **crypto pki trust pool import terminal** command.

crypto pki trust pool import terminal

Syntax Description	This command has no keywords or arguments.

Command Default None

Command Modes Global Configuration

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Usage Guidelines

This example shows how to import the root certificate by pasting the CA certificate from the **digicert.com**:

```
Device# configure terminal
Device(config)# crypto pki trust pool import terminal
Device(config)# end
```

crypto pki trustpool clean

To erase the downloaded CA certificate bundles, use the **crypto pki trustpool clean** command.

crypto pki trustpool clean

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Usage Guidelines

This example shows how to erase the downloaded CA certificate bundles:

```
Device# configure terminal
Device(config)# crypto pki trustpool clean
Device(config)# end
```

cts inline-tagging

To configure Cisco TrustSec (CTS) inline tagging, use the **cts inline-tagging** command.

cts inline-tagging

Syntax Description   This command has no keywords or arguments.

Command Default   Inline tagging is not configured.

Command Modes   wireless policy configuration (config-wireless-policy)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

This example shows how to configure CTS inline tagging.

```
Device(config-wireless-policy)# cts inline-tagging
```

cts role-based enforcement

To configure Cisco TrustSec (CTS) SGACL enforcement, use the **cts role-based enforcement** command.

cts role-based enforcement

Syntax Description   This command has no keywords or arguments.

Command Default   SGACL is not enforced.

Command Modes   wireless policy configuration (config-wireless-policy)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

This example shows how to configure CTS SGACL enforcement.

```
Device(config-wireless-policy)# cts role-based enforcement
```

cts sgt

To set the Cisco TrustSec (CTS) default security group tag (SGT), use the **cts sgt** command.

cts sgt   *sgt-value*

Syntax Description

sgt-value	Security group tag value.

Command Default   SGT tag is not set.

Command Modes   wireless policy configuration (config-wireless-policy)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

This example shows how to set the default SGT.

```
Device(config-wireless-policy)# cts sgt 100
```

custom-page login device

To configure a customized login page, use the **custom-page login device** command.

custom-page login device *html-filename*

Syntax Description

html-filename	Enter the HTML filename of the login page.

Command Default   None

Command Modes   config-params-parameter-map

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure a customized login page:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# parameter-map type webauth parameter-map-name
Device(config-params-parameter-map)# custom-page login device bootflash:login.html
```

default

To set the parameters to their default values, use the **default** command.

default {**aaa-override** | **accounting-list** | **band-select** | **broadcast-ssid** | **call-snoop** | **ccx** | **channel-scan** | **parameters** | **chd** | **client** | **datalink** | **diag-channel** | **dtim** | **exclusionlist** | **ip** | **ipv6** | **load-balance** | **local-auth** | **mac-filtering** | **media-stream** | **mfp** | **mobility** | **nac** | **passive-client** | **peer-blocking** | **radio** | **roamed-voice-client** | **security** | **service-policy** | **session-timeout** | **shutdown** | **sip-cac** | **static-ip** | **uapsd** | **wgb** | **wmm**}

Syntax Description		
aaa-override	Sets the AAA override parameter to its default value.
accounting-list	Sets the accounting parameter and its attributes to their default values.
band-select	Sets the band selection parameter to its default values.
broadcast-ssid	Sets the broadcast Service Set Identifier (SSID) parameter to its default value.
call-snoop	Sets the call snoop parameter to its default value.
ccx	Sets the Cisco client extension (Cisco Aironet IE) parameters and attributes to their default values.
channel-scan	Sets the channel scan parameters and attributes to their default values.
chd	Sets the coverage hold detection parameter to its default value.
client	Sets the client parameters and attributes to their default values.
datalink	Sets the datalink parameters and attributes to their default values.
diag-channel	Sets the diagnostic channel parameters and attributes to their default values.
dtim	Sets the Delivery Traffic Indicator Message (DTIM) parameter to its default value.
exclusionlist	Sets the client exclusion timeout parameter to its default value.
ip	Sets the IP parameters to their default values.
ipv6	Sets the IPv6 parameters and attributes to their default values.
load-balance	Sets the load-balancing parameter to its default value.
local-auth	Sets the Extensible Authentication Protocol (EAP) profile parameters and attributes to their default values.
mac-filtering	Sets the MAC filtering parameters and attributes to their default values.
media-stream	Sets the media stream parameters and attributes to their default values.

mfp	Sets the Management Frame Protection (MPF) parameters and attributes to their default values.
mobility	Sets the mobility parameters and attributes to their default values.
nac	Sets the RADIUS Network Admission Control (NAC) parameter to its default value.
passive-client	Sets the passive client parameter to its default value.
peer-blocking	Sets the peer to peer blocking parameters and attributes to their default values.
radio	Sets the radio policy parameters and attributes to their default values.
roamed-voice-client	Sets the roamed voice client parameters and attributes to their default values.
security	Sets the security policy parameters and attributes to their default values.
service-policy	Sets the WLAN quality of service (QoS) policy parameters and attributes to their default values.
session-timeout	Sets the client session timeout parameter to its default value.
shutdown	Sets the shutdown parameter to its default value.
sip-cac	Sets the Session Initiation Protocol (SIP) Call Admission Control (CAC) parameters and attributes to their default values.
static-ip	Sets the static IP client tunneling parameters and their attributes to their default values.
uapsd	Sets the Wi-Fi Multimedia (WMM) Unscheduled Automatic Power Save Delivery (UAPSD) parameters and attributes to their default values.
wgb	Sets the Workgroup Bridges (WGB) parameter to its default value.
wmm	Sets the WMM parameters and attributes to their default values.

Command Default   None.

Command Modes   WLAN configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   You must disable the WLAN before using this command. See Related Commands section for more information on how to disable a WLAN.

This example shows how to set the Cisco Client Extension parameter to its default value:

```
Device(config-wlan)# default ccx aironet-iesupport
```

daisychain-stp-redundancy

To enable redundant Root Access Point (RAP) ethernet daisy chaining on a mesh profile, use the **daisychain-stp-redundancy** command.

daisychain-stp-redundancy

Syntax Description	This command has no keywords or arguments.

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.4.1	This command was introduced.

Usage Guidelines

This example shows how to enable redundant RAP ethernet daisy chaining on a mesh profile:

```
Device# configure terminal
Device(config)# wireless profile mesh default-mesh-profile
Device(config-wireless-mesh-profile)# daisychain-stp-redundancy
Device(config-wireless-mesh-profile)# end
```

debug platform qos-acl-tcam

To enable debugging of the quality of service (QoS) and access control list (ACL) hardware memory manager software, use the **debug platform qos-acl-tcam** command in privileged or user EXEC mode. To disable debugging, use the **no** form of this command.

debug platform qos-acl-tcam {**all** | **ctcam** | **errors** | **labels** | **mask** | **rpc** | **tcam**}
no debug platform qos-acl-tcam {**all** | **ctcam** | **errors** | **labels** | **mask** | **rpc** | **tcam**}

Syntax Description		
	all	Displays all QoS and ACL ternary content addressable memory (QATM) manager debug messages.
	ctcam	Displays Cisco TCAM (CTCAM) related-events debug messages.
	errors	Displays QATM error-related-events debug messages.
	labels	Displays QATM label-related-events debug messages.
	mask	Displays QATM mask-related-events debug messages.
	rpc	Displays QATM remote procedure call (RPC) related-events debug messages.
	tcam	Displays QATM hardware-memory-related events debug messages.

Command Default   Debugging is disabled.

Command Modes   User EXEC

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The **undebug platform qos-acl-tcam** command is the same as the **no debug platform qos-acl-tcam** command.

When you enable debugging on a switch stack, it is enabled only on the active switch. To enable debugging on a stack member, you can start a session from the active switch by using the **session** *switch-number* EXEC command. Then enter the **debug** command at the command-line prompt of the stack member. You also can use the **remote command** *stack-member-number LINE* EXEC command on the active switch to enable debugging on a member switch without first starting a session.

debug platform packet-trace

To enable conditional debugging packet tracing, use the **debug platform packet-trace** command in privileged or user EXEC mode. To disable debugging, use the **no** form of this command.

debug platform packet-trace {**copy** | **drop** | **inject** | **packet** | **punt** | **statistics**}
no debug platform packet-trace {**copy** | **drop** | **inject** | **packet** | **punt** | **statistics**}

Syntax Description		
	copy	Displays copy packet data.
	drop	Displays trace drops only.
	inject	Displays trace injects only.
	packet	Displays packet count.
	punt	Displays trace punts only.
	statistics	Displays packet trace statistics.

Command Default Debugging is disabled.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Usage Guidelines The **undebug platform packet-trace** command is the same as the **no debug platform packet-trace** command.

For reference, see the following **Cisco ASR 1000 Series Aggregation Services Routers** documentation:

https://www.cisco.com/c/en/us/support/docs/content-networking/adaptive-session-redundancy-asr/117858-technote-asr-00.html

debug platform hardware chassis active qfp feature wireless datapath trace-buffer debug-level

To enables the debug level information for global and filtered logic, use the **debug platform hardware chassis active qfp feature wireless datapath trace-buffer debug-level** command. Use the **no** form of this command to disable the feature.

debug platform hardware chassis active qfp feature wireless datapath trace-buffer debug-level { **all** | **error** | **info** | **trace** | **warning** }

no debug platform hardware chassis active qfp feature wireless datapath trace-buffer debug-level { **all** | **error** | **info** | **trace** | **warning** }

Syntax Description	**debug platform hardware chassis active qfp feature wireless datapath trace-buffer debug-level**	Enables QFP wireless debug level.
	all	Enables all debug.
	error	Enables Error debug. Error is the default in the debug level.
	info	Enables Info debug.
	trace	Enables Trace debug.
	warning	Enables Warning debug.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to enable the debug level information for global and filtered logic:

```
Device# debug platform hardware chassis active qfp feature wireless datapath trace-buffer
debug-level all
```

debug platform hardware chassis active qfp feature wireless datapath trace-buffer ingress filtered-trace

To enables the Quantum Flow Processor on filtered trace buffer in the ingress path, use the **debug platform hardware chassis active qfp feature wireless datapath trace-buffer ingress filtered-trace** command. Use the **no** form of this command to disable the feature.

debug platform hardware chassis active qfp feature wireless datapath trace-buffer ingress { **filtered-trace** { **capwap** { *ipv4* | *ipv6* | **keepalive** } | **wlclient** { **ipv6-nd** | **ipv6-ra** | **mac-address** *H.H.H* } }

no debug platform hardware chassis active qfp feature wireless datapath trace-buffer ingress { **filtered-trace** { **capwap** { *ipv4* | *ipv6* | **keepalive** } | **wlclient** { **ipv6-nd** | **ipv6-ra** | **mac-address** *H.H.H* } }

Syntax Description		
	debug platform hardware chassis active qfp feature wireless datapath trace-buffer ingress filtered-trace	Enables QFP wireless ingress packet filtered trace.
	capwap	Enables the condition for CAPWAP to log packet information to the filtered trace buffer.
	wlclient	Enables the condition for wireless client to log packet information to the filtered trace buffer.
	keepalive	Enables keepalive logging for all CAPWAP tunnels.
	ipv4	Enables keepalive logging for the specified CAPWAP IPv4 address.
	ipv6	Enables keepalive logging for the specified CAPWAP IPv6 address.
	ipv6-nd	Enables IPv6 neighbor discovery for all wireless clients.
	ipv6-ra	Enables IPv6 router advertisements for all wireless clients.
	mac-address *H.H.H*	Enables packet logging for specified client MAC address.

Command Default	None

Command Modes	Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines	None

Example

The following example shows you how to enable the Quantum Flow Processor on filtered trace buffer in the ingress path:

```
Device# debug platform hardware chassis active qfp feature wireless datapath trace-buffer
ingress filtered-trace capwap ipv4 209.165.200.224/27
```

debug platform hardware chassis active qfp feature wireless datapath trace-buffer ingress global-trace

To enables the Quantum Flow Processor on global trace buffer in the ingress path, use the **debug platform hardware chassis active qfp feature wireless datapath trace-buffer ingress global-trace** command. Use the **no** form of this command to disable the feature.

debug platform hardware chassis active qfp feature wireless datapath trace-buffer ingress global-trace

no debug platform hardware chassis active qfp feature wireless datapath trace-buffer ingress global-trace

Syntax Description	**debug platform hardware chassis active qfp feature wireless datapath trace-buffer ingress global-trace**	Enables QFP wireless ingress packet global trace.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to enable the Quantum Flow Processor on global trace buffer in the ingress path:

```
Device# debug platform hardware chassis active qfp feature wireless datapath trace-buffer
ingress global-trace
```

debug platform hardware chassis active qfp feature wireless datapath trace-buffer punt-inject filtered-trace

To enables the Quantum Flow Processor on filtered trace buffer in the ingress path, use the **debug platform hardware chassis active qfp feature wireless datapath trace-buffer punt-inject filtered-trace** command. Use the **no** form of this command to disable the feature.

debug platform hardware chassis active qfp feature wireless datapath trace-buffer punt-inject filtered-trace { **filtered-trace** { **capwap** { *ipv4* | *ipv6* | **keepalive** } | **wlclient** { **ipv6-nd** | **ipv6-ra** | **mac-address** *H.H.H* } }

no debug platform hardware chassis active qfp feature wireless datapath trace-buffer punt-inject filtered-trace { **filtered-trace** { **capwap** { *ipv4* | *ipv6* | **keepalive** } | **wlclient** { **ipv6-nd** | **ipv6-ra** | **mac-address** *H.H.H* } }

Syntax Description		
	debug platform hardware chassis active qfp feature wireless datapath trace-buffer punt-inject filtered-trace	Enables the filtered trace buffer in the punt-inject path.
	capwap	Enables the condition for CAPWAP to log packet information to the filtered trace buffer in the punt-inject path.
	wlclient	Enables the condition for wireless client to log packet information to the filtered trace buffer in the punt-inject path.
	keepalive	Enables keepalive logging for all CAPWAP tunnels.
	ipv4	Enables keepalive logging for the specified CAPWAP IPv4 address.
	ipv6	Enables keepalive logging for the specified CAPWAP IPv6 address.
	ipv6-nd	Enables IPv6 neighbor discovery for all wireless clients.
	ipv6-ra	Enables IPv6 router advertisements for all wireless clients.
	mac-address *H.H.H*	Enables packet logging for specified client MAC address.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to enable the Quantum Flow Processor on filtered trace buffer in the punt-inject path:

```
Device# debug platform hardware chassis active qfp feature wireless datapath trace-buffer
punt-inject filtered-trace capwap ipv4 209.165.200.224/27
```

debug platform hardware chassis active qfp feature wireless datapath trace-buffer punt-inject global-trace

To enable the Quantum Flow Processor on global trace buffer in the punt-inject path, use the **debug platform hardware chassis active qfp feature wireless datapath trace-buffer punt-inject global-trace** command. Use the **no** form of this command to disable the feature.

debug platform hardware chassis active qfp feature wireless datapath trace-buffer punt-inject global-trace

no debug platform hardware chassis active qfp feature wireless datapath trace-buffer punt-inject global-trace

Syntax Description	**debug platform hardware chassis active qfp feature wireless datapath trace-buffer punt-inject global-trace**	Enables the Quantum Flow Processor on global trace buffer in the punt-inject path.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines None

Example

The following example shows you how to enables the Quantum Flow Processor on global trace buffer in the punt-inject path:

```
Device# debug platform hardware chassis active qfp feature wireless datapath trace-buffer
punt-inject global-trace
```

debug qos-manager

To enable debugging of the quality of service (QoS) manager software, use the **debug qos-manager** command in privileged EXEC mode. Use the **no** form of this command to disable debugging.

debug qos-manager {**all** | **event** | **verbose**}
no debug qos-manager {**all** | **event** | **verbose**}

Syntax Description

all	Display all QoS-manager debug messages.
event	Display QoS-manager related-event debug messages.
verbose	Display QoS-manager detailed debug messages.

Command Default   Debugging is disabled.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The **undebug qos-manager** command is the same as the **no debug qos-manager** command.

description

To configure a description for a flow monitor, flow exporter, or flow record, use the **description** command in the appropriate configuration mode. To remove a description, use the **no** form of this command.

description *description*
no description *description*

Syntax Description	*description* Text string that describes the flow monitor, flow exporter, or flow record.

Command Default   The default description for a flow sampler, flow monitor, flow exporter, or flow record is "User defined."

Command Modes   The following command modes are supported:

Flow exporter configuration

Flow monitor configuration

Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   To return this command to its default setting, use the **no description** or **default description** command in the appropriate configuration mode.

The following example configures a description for a flow monitor:

```
Device(config)# flow monitor FLOW-MONITOR-1
Device(config-flow-monitor)# description Monitors traffic to 172.16.0.1 255.255.0.0
```

destination

To configure an export destination for a flow exporter, use the **destination** command in flow exporter configuration mode. To remove an export destination for a flow exporter, use the **no** form of this command.

destination {*hostname*|*ip-address*}
no destination {*hostname*|*ip-address*}

Syntax Description	*hostname* Hostname of the device to which you want to send the NetFlow information.
	ip-address IPv4 address of the workstation to which you want to send the NetFlow information.

Command Default An export destination is not configured.

Command Modes Flow exporter configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines Each flow exporter can have only one destination address or hostname.

When you configure a hostname instead of the IP address for the device, the hostname is resolved immediately and the IPv4 address is stored in the running configuration. If the hostname-to-IP-address mapping that was used for the original Domain Name System (DNS) name resolution changes dynamically on the DNS server, the device does not detect this, and the exported data continues to be sent to the original IP address, resulting in a loss of data.

To return this command to its default setting, use the **no destination** or **default destination** command in flow exporter configuration mode.

The following example shows how to configure the networking device to export the cache entry to a destination system:

```
Device(config)# flow exporter FLOW-EXPORTER-1
Device(config-flow-exporter)# destination 10.0.0.4
```

device-role (IPv6 snooping)

To specify the role of the device attached to the port, use the **device-role** command in IPv6 snooping configuration mode.

device-role {**node** | **switch**}

Syntax Description	**node** Sets the role of the attached device to node.
	switch Sets the role of the attached device to switch.
Command Default	The device role is node.
Command Modes	IPv6 snooping configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The **device-role** command specifies the role of the device attached to the port. By default, the device role is node.

The **switch** keyword indicates that the remote device is a switch and that the local switch is now operating in multiswitch mode; binding entries learned from the port will be marked with trunk_port preference level. If the port is configured as a trust-port, binding entries will be marked with trunk_trusted_port preference level.

This example shows how to define an IPv6 snooping policy name as policy1, place the device in IPv6 snooping configuration mode, and configure the device as the node:

```
Device(config)# ipv6 snooping policy policy1
Device(config-ipv6-snooping)# device-role node
```

device-role (IPv6 nd inspection)

To specify the role of the device attached to the port, use the **device-role** command in neighbor discovery (ND) inspection policy configuration mode.

device-role {**host** | **monitor** | **router** | **switch**}

Syntax Description		
	host	Sets the role of the attached device to host.
	monitor	Sets the role of the attached device to monitor.
	router	Sets the role of the attached device to router.
	switch	Sets the role of the attached device to switch.

Command Default   The device role is host.

Command Modes   ND inspection policy configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
		The keywords **monitor** and **router** are deprecated.

Usage Guidelines   The **device-role** command specifies the role of the device attached to the port. By default, the device role is host, and therefore all the inbound router advertisement and redirect messages are blocked. If the device role is enabled using the **router** keyword, all messages (router solicitation [RS], router advertisement [RA], or redirect) are allowed on this port.

When the **router** or **monitor** keyword is used, the multicast RS messages are bridged on the port, regardless of whether limited broadcast is enabled. However, the monitor keyword does not allow inbound RA or redirect messages. When the monitor keyword is used, devices that need these messages will receive them.

The **switch** keyword indicates that the remote device is a switch and that the local switch is now operating in multiswitch mode; binding entries learned from the port will be marked with trunk_port preference level. If the port is configured as a trust-port, binding entries will be marked with trunk_trusted_port preference level.

The following example defines a Neighbor Discovery Protocol (NDP) policy name as policy1, places the device in ND inspection policy configuration mode, and configures the device as the host:

```
Device(config)# ipv6 nd inspection policy policy1
Device(config-nd-inspection)# device-role host
```

device-tracking binding

To configure the timer values for the IP entries of wireless clients in different states, use the **device-tracking binding** command. To disable the configured timer values for the IP entries, use the **no** form of this command.

device-tracking binding { **down-lifetime** | **reachable-lifetime** | **stale-lifetime** } { *seconds* | **infinite** }

no device-tracking binding { **down-lifetime** | **reachable-lifetime** | **stale-lifetime** }

Syntax Description		
down-lifetime	Specifies the maximum time in down state before removal of the IP binding entry.
reachable-lifetime	Specifies the maximum time in reachable state without any activity for an IP binding entry.
stale-lifetime	Specifies the maximum time in stale state before deletion of an IP binding entry.
seconds	The timer value for the IP entries, in seconds. The valid range is from 1 to 86400 seconds.
infinite	Indicates that the timer interval does not expire.

Command Default None

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1.	This command was introduced in a release earlier than Cisco IOS XE Amsterdam 17.3.1.

Examples The following example shows how to configure the timer values for the IP entries of wireless clients in different states:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# device-tracking binding stale-lifetime 3
```

device-tracking binding vlan

To configure IPv4 or IPv6 static entry, use the **device-tracking binding vlan** command.

device-tracking binding vlan *vlan-id* {*ipv4-addr ipv6-addr* }**interface gigabitEthernet** *ge-intf-num*
hardware-or-mac-address

Syntax Description		
vlan-id	VLAN ID. Valid range is 1 to 4096.
ipv4-addr	IPv4 address of the device.
ipv6-addr	IPv6 address of the device.
interface gigabitEthernet	GigabitEthernet IEEE 802.3z.
ge-intf-num	GigabitEthernet interface number. Valid range is 1 to 32.
hardware-or-mac-address	The 48-bit hardware address or the MAC address of the device.

Command Default None

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure IPv4 static entry:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# device-tracking binding vlan 20 20.20.20.5 interface gigabitEthernet 1
0000.1111.2222
```

device-tracking policy

To configure a Switch Integrated Security Features (SISF)-based IP device tracking policy, use the **device-tracking** command in global configuration mode. To delete a device tracking policy, use the **no** form of this command.

device -tracking policy *policy-name*
no device-tracking policy *policy-name*

Syntax Description	*policy-name*	User-defined name of the device tracking policy. The policy name can be a symbolic string (such as Engineering) or an integer (such as 0).

Command Default   A device tracking policy is not configured.

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   Use the SISF-based **device-tracking policy** command to create a device tracking policy. When the **device-tracking policy** command is enabled, the configuration mode changes to device-tracking configuration mode. In this mode, the administrator can configure the following first-hop security commands:

* (Optional) **device-role**{**node**] | **switch**}—Specifies the role of the device attached to the port. Default is **node**.

* (Optional) **limit address-count** *value*—Limits the number of addresses allowed per target.

* (Optional) **no**—Negates a command or sets it to defaults.

* (Optional) **destination-glean**{**recovery**| **log-only**}[**dhcp**]}—Enables binding table recovery by data traffic source address gleaning.

* (Optional) **data-glean**{**recovery**| **log-only**}[**dhcp** | **ndp**]}—Enables binding table recovery using source or data address gleaning.

* (Optional) **security-level**{**glean**|**guard**|**inspect**}—Specifies the level of security enforced by the feature. Default is **guard.**

   glean—Gleans addresses from messages and populates the binding table without any verification.
   guard—Gleans addresses and inspects messages. In addition, it rejects RA and DHCP server messages. This is the default option.
   inspect—Gleans addresses, validates messages for consistency and conformance, and enforces address ownership.

* (Optional) **tracking** {**disable** | **enable**}—Specifies a tracking option.

* (Optional) **trusted-port**—Sets up a trusted port. It disables the guard on applicable targets. Bindings learned through a trusted port have preference over bindings learned through any other port. A trusted port is given preference in case of a collision while making an entry in the table.

This example shows how to configure an a device-tracking policy:

```
Device(config)# device-tracking policy policy1
Device(config-device-tracking)# trusted-port
```

Configuration Commands: a to f

destination-ports

destination-ports

To configure a destination port to communicate with the controller, use the **destination-ports** command. To disable the port used to communicate with the controller, use the **no** form of this command.

destination-ports { **application-updates** | **sensor-exporter** } *port-value*

no destination-ports { **application-updates** | **sensor-exporter** }

Syntax Description		
application-updates	Configures the TCP port for application updates.
sensor-exporter	Configures the UDP port for sensor messages.
port-value	Port value. Valid range is from 1 to 65535.

Command Default Destination port is not configured.

Command Modes SD Service Controller Configuration (config-sd-service-controller)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Examples The following example shows how to configure a destination port for communicating with the controller:

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
VM1(config)# avc sd-service
Device(config-sd-service)# controller
Device(config-sd-service-controller)# destination-ports application-updates 650
```

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dhcp-server

To enable DHCP server for a Cisco AP profile, use the **dhcp-server** command.

dhcp-server

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Usage Guidelines

This example shows how to enable DHCP server for a Cisco AP profile:

```
Device# configure terminal
Device(config)# ap profile ap-prof1
Device(config-ap-profile)# dhcp-server
```

dhcp-tlv-caching

To configure DHCP TLV caching on a WLAN, use the **dhcp-tlv-caching** command.

dhcp-tlv-caching

Command Default	None
Command Modes	config-wireless-policy

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

This example shows how to configure DHCP TLV caching on a WLAN:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy rr-xyz-policy-1
Device(config-wireless-policy)# dhcp-tlv-caching
Device(config-wireless-policy)# radius-profiling
Device(config-wireless-policy)# end
```

dns-server (IPv6)

To specify the Domain Name System (DNS) IPv6 servers available to a Dynamic Host Configuration Protocol (DHCP) for IPv6 client, use the **dns-server** command in DHCP for IPv6 pool configuration mode. To remove the DNS server list, use the **no** form of this command.

dns-server *ipv6-address*
no dns-server *ipv6-address*

Syntax Description	*ipv6-address*	The IPv6 address of a DNS server.
		This argument must be in the form documented in RFC 2373 where the address is specified in hexadecimal using 16-bit values between colons.

Command Default   When a DHCP for IPv6 pool is first created, no DNS IPv6 servers are configured.

Command Modes

DHCP for IPv6 pool configuration

Command History

Release	Modification
12.3(4)T	This command was introduced.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
12.2(33)SRE	This command was modified. It was integrated into Cisco IOS Release 12.2(33)SRE.

12.2(33)XNE	This command was modified. It was integrated into Cisco IOS Release 12.2(33)XNE.

Usage Guidelines   Multiple Domain Name System (DNS) server addresses can be configured by issuing this command multiple times. New addresses will not overwrite old addresses.

Examples   The following example specifies the DNS IPv6 servers available:

```
dns-server 2001:0DB8:3000:3000::42
```

Related Commands

Command	Description
domain-name	Configures a domain name for a DHCP for IPv6 client.
ipv6 dhcp pool	Configures a DHCP for IPv6 configuration information pool and enters DHCP for IPv6 pool configuration mode.

dnscrypt

To enable or disable DNScrypt, use the **dnscrypt** command.

dnscrypt

Command Default	None

Command Modes	config-profile

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines By default, the DNScrypt option is enabled.

This example shows how to enable or disable DNScrypt:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# parameter-map type umbrella global
Device(config-profile)# token 57CC80106C087FB1B2A7BAB4F2F4373C00247166
Device(config-profile)# local-domain dns_wl
Device(config-profile)# no dnscrypt
Device(config-profile)# end
```

domain

To configure a 802.11u domain name, use the **domain** command. To remove domain name, use the **no** form of the command.

domain *domain-name*

Syntax Description	*domain-name* 802.11u domain name. You can configure up to 32 domain names. The *domain-name* should not exceed 220 characters.

Command Default   None

Command Modes   Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure a 802.11u domain name:

```
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# domain my-domain
```

domain-name (DHCP)

To specify the domain n ame for a Dynamic Host Configuration Protocol (DHCP) client, use the **domain-name** command in DHCP pool configuration mode. To remove the domain name, use the no form of this command.

domain-name *domain*
no domain-name

Syntax Description

domain	Specifies the domain name string of the client.

Command Default   No default behavior or values.

Command Modes   DHCP pool configuration

Command History

Release	Modification
12.0(1)T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following example specifies cisco.com as the domain name of the client:

```
domain-name cisco.com
```

Related Commands

Command	Description
dns-server	Specifies the DNS IP servers available to a DHCP client.
ip dhcp pool	Configures a DHCP address pool on a Cisco IOS DHCP server and enters DHCP pool configuration mode.

dot11 airtime-fairness

To configure airtime-fairness policy for 2.4- or 5-GHz radio, use the **dot11 airtime-fairness** command.

dot11 {**24ghz**| **5ghz** }**airtime-fairness** *atf-policy-name*

Syntax Description

| *atf-policy-name* | Is the name of the airtime-fairness policy. |

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure airtime-fairness policy for 2.4- or 5-GHz radio:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy <profile-name>
Device(config-wireless-policy)# dot11 24ghz airtime-fairness <atf-policy-name>
Device(config-wireless-policy)# end
```

dot11ax

To configure 802.11ax on a WLAN, use the **dot11ax** command.

dot11ax { **bss-colorcode** *color-code-range* | **bss-colormode** | **bss-partialcolor** | **downlink-mumimo** | **downlink-ofdma** | **target-waketime** | **twt-broadcast-support** | **uplink-mumimo** | **uplink-ofdma** }

Syntax Description		
	bss-colorcode	BSS color code on a WLAN.
	color-code-range	BSS color code range. Valid range is from 0-255.
	bss-colormode	BSS color mode on a WLAN.
	bss-partialcolor	BSS patrial color mode on a WLAN.
	downlink-mumimo	Downlink MUMIMO on a WLAN.
	downlink-ofdma	Downlink OFDMA on a WLAN.
	target-waketime	Target wake time mode on a WLAN.
	twt-broadcast-support	TWT broadcast support on a WLAN.
	uplink-mumimo	Uplink MUMIMO on a WLAN.
	uplink-ofdma	Uplink OFDMA on a WLAN.

Command Default   None

Command Modes   WLAN Configuration (config-wlan)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines   This command is supported only on IEEE 802.11ax APs.

Example

The following example shows how to configure uplink OFDMA on a WLAN.

```
Device(config-wlan)# dot11ax uplink-ofdma
```

dot11ax bcast-probe-response

To configure the 802.11ax broadcast probe response, use the **dot11ax bcast-probe-response** command. Use the **no** form of this command to disable this feature.

dot11ax bcast-probe-response

no dot11ax bcast-probe-response

Syntax Description	This command has no arguments or keywords.

Command Default   None

Command Modes   RF configuration mode

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Example

The following example shows how to configure 802.11ax broadcast probe response:

```
Device(config)# ap dot11 6ghz rf-profile rf-profile-name
Device(config-rf-profile)# dot11ax bcast-probe-response
```

dot11ax bcast-probe-response time-interval

To configure the 802.11ax broadcast probe response interval, use the **dot11ax bcast-probe-response time-interval** command. Use the **no** form of this command to disable this feature.

dot11ax bcast-probe-response time-interval *5-25*

no dot11ax bcast-probe-response time-interval *5-25*

Syntax Description	*5-25*	Specifies the broadcast probe response time interval.

Command Default None

Command Modes RF configuration mode

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Example

The following example shows how to configure 802.11ax broadcast probe response interval:

```
Device(config)# ap dot11 6ghz rf-profile rf-profile-name
Device(config-rf-profile)# dot11ax bcast-probe-response time-interval 25
```

dot11ax fils-discovery

To configure the 802.11ax fast initial link setup (FILS) discovery frame for broadcast, use the **dot11ax fils-discovery** command. Use the **no** form of this command to disable this feature.

dot11ax fils-discovery

no dot11ax fils-discovery

Syntax Description	This command has no arguments or keywords.

Command Default	None

Command Modes	RF configuration mode

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Example

The following example shows how to configure 802.11ax fast initial link setup (FILS) discovery frame for broadcast :

```
Device(config)# ap dot11 6ghz rf-profile rf-profile-name
Device(config-rf-profile)# dot11ax fils-discovery
```

dot11ax multi-bssid-profile

To configure the 802.11ax multi BSSID profile name, use the **dot11ax multi-bssid-profile**. Use the **no** form of this command to disable this feature.

dot11ax multi-bssid-profile *multi-bssid-profilename*

no dot11ax multi-bssid-profile *multi-bssid-profilename*

Syntax Description	*multi-bssid-profilename* Specifies the multi BSSID profile name.

Command Default   None

Command Modes   RF configuration mode

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Example

The following example shows how to configure the 802.11ax multi BSSID profile name:

```
Device(config)# ap dot11 6ghz rf-profile rf-profile-name
Device(config-rf-profile)# dot11ax multi-bssid-profile multi-bssid-profilename
```

dot11ax spatial-reuse obss-pd

To configure 802.11ax OBSS PD max in the RF profile configuration mode, use the **dot11ax spatial-reuse obss-pd**

dot11ax spatial-reuse obss-pd

no dot11ax spatial-reuse obss-pd

Syntax Description	**spatial-reuse obss-pd**	Configures 802.11ax OBSS PD based spatial reuse in the RF profile configuration mode.

Command Default   None

Command Modes   RF profile configuration

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.4.1	This command was introduced.

Example

The following example shows how to configures 802.11ax OBSS PD based spatial reuse in the RF profile configuration mode:

```
Device(config-rf-profile)# dot11ax spatial-reuse obss-pd
```

dot11ax spatial-reuse obss-pd non-srg-max

To configure 802.11ax non-SRG OBSS PD max in the RF profile configuration mode, use the **dot11ax spatial-reuse obss-pd non-srg-max** *-82 - -62*

dot11ax spatial-reuse obss-pd non-srg-max *-82 - -62*

no dot11ax spatial-reuse obss-pd non-srg-max *-82 - -62*

Syntax Description	**spatial-reuse obss-pd non-srg-max**	Configures 802.11ax non-SRG OBSS PD based spatial reuse in the RF profile configuration mode.
	-82 - -62	Sprcifies the non-SRG OBSS PD max value in dBm

Command Default None

Command Modes RF profile configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Bengaluru 17.4.1	This command was introduced.

Example

The following example shows how to configures 802.11ax non-SRG OBSS PD based spatial reuse in the RF profile configuration mode:

```
Device(config-rf-profile)# dot11ax spatial-reuse obss-pd non-srg-max -80
```

dot11ax target-waketime

To configure target wake time mode on WLAN, use the **dot11ax target-waketime** command. To disable the feature, use the **no** command of the command.

dot11ax target-waketime

[no] dot11ax target-waketime

| Syntax Description | **target-waketime** | Configures target wake time mode on WLAN. |

Command Default   None

Command Modes   WLAN configuration

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Example

This example shows how to configure target wakeup time on WLAN:

```
Device(config-wlan)# dot11ax target-waketime
```

dot11ax twt-broadcast-support

To configure TWT broadcast support on WLAN, use the **dot11ax twt-broadcast-support** command. To disable the feature, use the **no** command of the command.

dot11ax twt-broadcast-support

[no] dot11ax twt-broadcast-support

| Syntax Description | **dot11ax twt-broadcast-support** | Configures the TWT broadcast support on WLAN |

Command Default   None

Command Modes   WLAN configuration

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Example

This example shows how to configure target wakeup time on WLAN:

```
Device(config-wlan)# dot11ax twt-broadcast-support
```

dot11 {24ghz slot0 | 5ghz {slot1 | slot2} radio-profile

Configures 802.11a or 802.11b radio profile, use the **dot11** {**24ghz slot0** | **5ghz** {**slot1** | **slot2**}}**radio-profile** *radio-profile-name* command. Use the **no** form of this command to disable the feature.

dot11 { **24ghz slot0** | **5ghz** { **slot1** | **slot2** } } **radio-profile** *radio-profile-name*

no dot11 { **24ghz slot0** | **5ghz** { **slot1** | **slot2** } } **radio-profile** *radio-profile-name*

Syntax Description	**dot11**{**24ghz slot0**	**5ghz** {**slot1**	**slot2**}}	• **dot11**: Configures 802.11 parameters.
		• **24ghz slot0**: Configures 802.11b policy for slot 0.
		• **5ghz**: Configures 802.11a parameters.
		• **slot1**: Configures 802.11a policy for slot 1.
		• **slot2**: Configures 802.11a policy for slot 2.
	radio-profile	Configures the 802.11a or 802.11a radio profiles.
	radio-profile-name	Specifies the 802.11a or 802.11a radio profile names.

Command Default	None

Command Modes	Wireless RF tag configuration mode

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to configure the 802.11a or 802.11b radio profile:

```
Device# configure terminal
Device(config)# wireless tag rf wireless-rf-tagname
Device(config-wireless-rf-tag)# dot11 5ghz slot1 radio-profile wireless-radio-profile
```

dot11bg 11g

To connect only 802.11g clients to the WLAN on the 2.4-GHz band, use the **dot11bg 11g** command.

dot11bg 11g

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   WLAN configuration

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines   The **dot11bg 11g** is a newly introduced command compared to **radio dot11bg** and **radio dot11g** commands. The configuration applied through the new **dot11bg 11g** command takes precedence over the other older commands. This is applicable specifically to the 2.4-GHz band and does not impact other bands.

Examples   The following example shows how to connect only 802.11g clients to the WLAN on the 2.4-GHz band:

```
Device # configure terminal
Device (config)# wlan wlan-test 4 ssid-name
Device (config-wlan)# broadcast-ssid
Device (config-wlan)# dot11bg 11g
```

dot11 5ghz reporting-interval

To configure the client report interval sent from AP for clients on 802.11a radio, use the **dot11 5ghz reporting-interval** command.

dot11 5ghz reporting-interval *reporting-interval*

Syntax Description

| *reporting-interval* | Interval at which client report needs to be sent in seconds. |

Command Default None

Command Modes config-ap-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to set the client report interval in seconds:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap profile profile-name
Device(config-ap-profile)# dot11 5ghz reporting-interval 8
```

dot11 reporting-interval

To set the volume metering interval, use the **dot11 reporting-interval** command.

dot11 {**24ghz** | **5ghz** } *reporting-interval*

Syntax Description	*reporting-interval* Interval to send client accounting statistics.

Command Default

Interval is configured at the default level of 90 seconds.

Command Modes

config-ap-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

Though the CLI allows you to configure range from 5 to 90 seconds, we recommend that you use 60 to 90 seconds range for Volume Metering.

This CLI can also be used to configure the interval when smart roam is enabled, which has a range of 5 to 90 seconds.

Though you can set two different values for volume metering and smart roam, only one value takes effect based on the order of execution. So, we recommend that you use the same reporting interval for both.

Example

The following example shows how to configure volume metering:

```
Device(config-ap-profile)# dot11 24ghz 60
```

dot1x system-auth-control

To globally enable 802.1X SystemAuthControl (port-based authentication), use the **dot1x system-auth-control**command in global configuration mode. To disable SystemAuthControl, use the **no** form of this command.

dot1x system-auth-control
no dot1x system-auth-control

Syntax Description

This command has no arguments or keywords.

Command Default

System authentication is disabled by default. If this command is disabled, all ports behave as if they are force authorized.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(2)XA	This command was introduced.
12.2(14)SX	This command was implemented on the Supervisor Engine 720.
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

The IEEE 802.1x standard defines a client-server-based access control and authentication protocol that restricts unauthorized devices from connecting to a LAN through publicly accessible ports. 802.1x controls network access by creating two distinct virtual access points at each port. One access point is an uncontrolled port; the other is a controlled port. All traffic through the single port is available to both access points. 802.1x authenticates each user device that is connected to a switch port and assigns the port to a VLAN before making available any services that are offered by the switch or the LAN. Until the device is authenticated, 802.1x access control allows only Extensible Authentication Protocol (EAP) over LAN (EAPOL) traffic through the port to which the device is connected. After authentication is successful, normal traffic can pass through the port.

The **no** form of the command removes any 802.1X-related configurations.

You must enable Authentication, Authorization, and Accounting (AAA) and specify the authentication method list before enabling 802.1X. A method list describes the sequence and authentication methods to be queried to authenticate a user.

Examples

The following example shows how to enable SystemAuthControl:

```
Router(config)# dot1x system-auth-control
```

Related Commands

Command	Description
aaa authentication dot1x	Specifies one or more AAA methods for use on interfaces running IEEE 802.1X.
aaa new-model	Enables the AAA access-control model.
debug dot1x	Displays 802.1X debugging information.
description	Specifies a description for an 802.1X profile.
device	Statically authorizes or rejects individual devices.
dot1x initialize	Initializes 802.1X state machines on all 802.1X-enabled interfaces.
dot1x max-req	Sets the maximum number of times that a router or Ethernet switch network module can send an EAP request/identity frame to a client (assuming that a response is not received) before restarting the authentication process.
dot1x port-control	Enables manual control of the authorized state of a controlled port.
dot1x re-authenticate	Manually initiates a reauthentication of the specified 802.1X-enabled ports.
dot1x reauthentication	Globally enables periodic reauthentication of the client PCs on the 802.1X interface.
dot1x timeout	Sets retry timeouts.
identity profile	Creates an identity profile and enters identity profile configuration mode.
show dot1x	Displays details and statistics for an identity profile.
template	Specifies a virtual template from which commands may be cloned.

dscp

To enable differentiated services code point (DSCP) marking, use the **dscp** command. To disable DSCP marking, use the **no** form of this command.

dscp *dscp-value*

no dscp

Syntax Description	*dscp-value* DSCP marking value. Valid range is from 0 to 63.

Command Default DSCP marking is not enabled.

Command Modes SD Service Controller Configuration (config-sd-service-controller)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Examples The following example shows how to enable DSCP marking:

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# avc sd-service
Device(config-sd-service)# controller
Device(config-sd-service-controller)# dscp 12
```

eap-method

To configure the Extensible Authentication Protocol (EAP) method for a Network Access Identifier (NAI) realm, use the **eap-method** command. To remove the EAP method for an NAI realm, use the **no** form of this command.

eap-method { **eap-aka** | **eap-fast** | **eap-leap** | **eap-peap** | **eap-sim** | **eap-tls** | **eap-ttls** }

Syntax Description		
	eap-aka	Enables EAP authentication and key agreement method.
		EAP-AKA is an EAP mechanism for authentication and session key distribution using the UMTS Subscriber Identity Module.
	eap-fast	Enables EAP flexible authentication through the secure tunneling method.
		EAP-FAST is a flexible EAP protocol that allows mutual authentication of a supplicant and a server. It is similar to EAP-PEAP, but typically does not require the use of client or server certificates.
	eap-leap	Enables EAP lightweight extensible authentication protocol method.
		EAP-LEAP is an EAP authentication protocol used primarily in Cisco Aironet WLANs. It encrypts data transmissions using dynamically generated wired equivalent privacy (WEP) keys, and supports mutual authentication.
	eap-peap	Enables EAP-protected extensible authentication protocol method.
		EAP-PEAP is an EAP authentication protocol used in wireless networks and point-to-point connections. PEAP is designed to provide more secure authentication for 802.11 WLANs that support 802.1X port access control.
	eap-sim	Enables EAP subscriber identity module method.
		EAP-SIM is an EAP authentication protocol used for authentication and session key distribution using the subscriber identity module (SIM) from the Global System for Mobile Communications (GSM).
	eap-tls	Enables EAP transport layer security method.
		EAP-TLS is an EAP authentication protocol, and an IETF open standard that uses the Transport Layer Security (TLS) protocol. EAP-TLS is the original, standard wireless LAN EAP authentication protocol.
	eap-ttls	Enables EAP-tunneled transport layer security method.
		EAP-TTLS is a simple WPA2-Enterprise Wi-Fi authentication method that has been a standard system for many years. When a user wants to connect to the network, the device initiates communication with the network and confirms that it is the correct network by identifying the server certificate.

Command Default   None

Command Modes   ANQP NAI EAP Configuration (config-anqp-nai-eap)

Command History	Release	Modification
	Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

The following example shows how to configure a EAP method:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless hotspot anqp-server my_anqp
Device(config-wireless-anqp-server)# nai-realm myvenue.cisco.com
Device(config-anqp-nai-eap)# eap-method eap-aka
```

eap profile

To configure an EAP profile, use the **eap profile** command.

eap profile *profile-name*

Syntax Description

profile-name	Name of the EAP profile. Maximum number of allowed characters is 63.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure an EAP profile name:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# eap profile eap-profile-name
```

et-analytics

To enable Encrypted Traffic Analytics (ETA) globally on Cisco Elastic Wireless LAN Controller (eWLC), use the **et-analytics** command.

et-analytics

Command Default	None
Command Modes	ET-Analytics configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to enable Encrypted Traffic Analytics (ETA) globally on Cisco Elastic Wireless LAN Controller (eWLC) in the ET-Analytics configuration mode:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# et-analytics
Device(config-et-analytics)# end
```

ethernet-vlan-transparent (mesh)

To configure ethernet bridging VLAN transparency for a mesh AP profile, use the **ethernet-vlan-transparent** command.

ethernet-vlan-transparent

Syntax Description	This command has no keywords or arguments.

Command Default Ethernet bridging VLAN transparency is enabled.

Command Modes config-wireless-mesh-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to configure ethernet bridging VLAN transparency for a mesh AP profile:

```
Device # configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device (config)# wireless profile mesh mesh-profile
Device (config-wireless-mesh-profile)# ethernet-vlan-transparent
```

ethernet-bridging (mesh)

To configure ethernet bridging for a mesh AP profile, use the **ethernet-bridging** command.

ethernet-bridging

Syntax Description   This command has no keywords or arguments.

Command Default   Ethernet bridging is disabled.

Command Modes   config-wireless-mesh-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to configure ethernet bridging for a mesh AP profile:

```
Device # configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device (config)# wireless profile mesh mesh-profile
Device (config-wireless-mesh-profile)# ethernet-bridging
```

event identity-update

To specify the match criteria to a policy map, use the **event identity-update** command.

event identity-update[**match-all** | **match-first**]

Syntax Description	**match-all**	Evaluates all the classes.
	match-first	Evaluates the first class.

Command Default	None
Command Modes	config-event-control-policymap

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to specify the match criteria as match all classes to a policy map:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# policy-map type control subscriber policy-map-name
Device(config-event-control-policymap)# event identity-update match-all
```

exclusionlist

To configure an exclusion list, use the **exclusionlist** command. To disable an exclusion list, use the **no** form of this command.

exclusionlist [**timeout** *seconds*]
no **exclusionlist** [**timeout**]

Syntax Description	**timeout** *seconds* (Optional) Specifies an exclusion list timeout in seconds. The range is from 0 to 2147483647. A value of zero (0) specifies no timeout.

Command Default	The exclusion list is set to 60 seconds.

Command Modes	Wireless policy configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure a client exclusion list:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy default-policy-profile
Device(config-wireless-policy)# exclusionlist timeout 5
```

exec-character-bits

To configure the character widths of EXEC and configuration command characters, use the **exec-character-bits** command in line configuration mode. To restore the default value, use the **no** form of this command.

exec-character-bits { *7* | *8* }

no exec-character-bits

Syntax Description	*7* Sets the 7-bit character set. This is the default.
	8 Sets the full 8-bit character set for use of international and graphical characters in banner messages, prompts, and so on.

Command Default 7-bit ASCII character set.

Command Modes Line configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines Setting the EXEC character width to 8 allows you to use special graphical and international characters in banners, prompts, and so on. However, setting the EXEC character width to 8 bits can cause failures. For example, if a user on a terminal that is sending parity enters the **help** command, an "unrecognized command" message appears because the system is reading all 8 bits, and the eighth bit is not needed for the **help** command.

Examples The following example shows how to configure the character widths of EXEC and configuration command characters :

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# line console 0
Device(config-line)# exec-character-bit 8
```

exec time-out

To set the interval that the EXEC command interpreter waits until user input is detected, use the **exec-timeout** command in line configuration mode. To remove the timeout duration, use the **no** form of this command.

exec time-out *minutes* [*seconds*]

exec time-out

| **Syntax Description** | *minutes* | Integer that specifies the number of minutes. The default is 10 minutes. |
| | *seconds* | (Optional) Additional time intervals, in seconds. |

| **Command Default** | 10 minutes |

| **Command Modes** | Line configuration |

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines If no input is detected during the interval, the EXEC facility resumes the current connection. If no connections exist, the EXEC facility returns the terminal to the idle state and disconnects the incoming session.

To specify no timeout, enter the **exec-timeout 0 0** command.

Examples The following example sets a time interval of 2 minutes, 30 seconds:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# line console 0
Device(config-line)# exec-timeout 12 0
```

exporter default-flow-exporter

To add an exporter to use to export records, use the **exporter default-flow-exporter** command. Use the **no** form of this command to disable the feature.

exporter default-flow-exporter

[no] exporter default-flow-exporter

Syntax Description

There are no arguments to this command.

Command Default

None

Command Modes

Flow monitor configuration

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Example

This example shows how to add an exporter to use to export records:

```
Device(config-flow-monitor)#exporter default-flow-exporter
```

fabric control-plane

To configure the fabric control plane details, use the **fabric control-plane** command.

fabric control-plane *map-server-name*

Syntax Description	*map-server-name* Refers to the fabric control plane name associated with the site tag.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure the fabric control plane details:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless tag site default-site-tag
Device(config-site-tag)# fabric control-plane
map-server-name
Device(config-site-tag)# end
```

fast-teardown

To enable fast teardown for a mesh access point (AP) profile and configure the feature's parameters, use the **fast-teardown** command.

✎

| **Note** | Fast Teardown for Mesh APs is not supported on Cisco Industrial Wireless (IW) 3702 Access Points. |

fast-teardown {enabled | interval *duration* **latency-exceeded-threshold | latency-threshold | uplink-recovery-interval** *duration* **| retries** *retry limit*

Syntax Description	**enabled**	Enables the fast teardown feature.
	interval	(optional) Configures the retry interval, in seconds. The valid values range between 1 and 10 seconds.
	latency-exceeded-threshold	(optional) Specifies the latency interval in which at least one ping must succeed in less than threshold time. The valid values range between 1 and 30 seconds.
	latency-threshold	(optional) Spefices the latency threshold. The valid values range between 1 and 500 milliseconds.
	uplink-recovery-interval	(Optional) Specifies the time during which root acccess point uplink has to be stable to accept child connections. The valid values range between 1 and 3600 seconds.
	retries	(optional) Specifies the maximum retries until the gateway is considered unreachable. The range is from 0 to 10.

Command Default	None

Command Modes	Fast Teardown configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Examples

The following example shows how to enable the fast teardown feature for a mesh AP profile and configure its parameters:

```
Device# configure terminal
Device(config)# wireless mesh profile mesh-profile-name
Device(config-wireless-mesh-profile)# fast-teardown
Device(config-wireless-mesh-profile-fast-teardown)# interval 1
```

fallback-radio-shut

To configure shutdown of the radio interface, use the **fallback-radio-shut** command.

fallback-radio-shut

Command Default None

Command Modes config-wireless-flex-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure shutdown of the radio interface:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile flex flex-profile-name
Device(config-wireless-flex-profile)# fallback-radio-shut
```

fips authorization-key

To configure FIPS, use the **fips authorization-key** command.

fips authorization-key *key*

Syntax Description	*key* The key length should be of 32 hexadecimal characters.

Command Default None

Command Modes Global configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines

Note	Ensure that both the active and standby controllers have the same FIPS authorization key.

This example shows how to configure FIPS:

```
Device# configure terminal
Device(config)# fips authorization-key 1234567890123456789012345678901
Device(config)# end
```

flex

To configure flex related parameters, use the **flex** command.

flex {**nat-pat** | **split-mac-acl** *split-mac-acl-name* | **vlan-central-switching** }

Syntax Description	**nat-pat**	Enables NAT-PAT.
	split-mac-acl	Configures split-mac-acl name.
	split-mac-acl-name	Name of split MAC ACL.
	vlan-central-switching	VLAN based central switching.

Command Default	None

Command Modes	config-wireless-policy

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure flex related VLAN central-switching:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy profile-name
Device(config-wireless-policy)# flex vlan-central-switching
```

flow exporter

To create a flow exporter, or to modify an existing flow exporter, and enter flow exporter configuration mode, use the **flow exporter** command in global configuration mode. To remove a flow exporter, use the **no** form of this command.

flow exporter *exporter-name*
no flow exporter *exporter-name*

Syntax Description	*exporter-name* Name of the flow exporter that is being created or modified.

Command Default flow exporters are not present in the configuration.

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines Flow exporters export the data in the flow monitor cache to a remote system, such as a server running NetFlow collector, for analysis and storage. Flow exporters are created as separate entities in the configuration. Flow exporters are assigned to flow monitors to provide data export capability for the flow monitors. You can create several flow exporters and assign them to one or more flow monitors to provide several export destinations. You can create one flow exporter and apply it to several flow monitors.

Examples The following example creates a flow exporter named FLOW-EXPORTER-1 and enters flow exporter configuration mode:

```
Device(config)# flow exporter FLOW-EXPORTER-1
Device(config-flow-exporter)#
```

flow monitor

To create a flow monitor, or to modify an existing flow monitor, and enter flow monitor configuration mode, use the **flow monitor** command in global configuration mode. To remove a flow monitor, use the **no** form of this command.

flow monitor *monitor-name*
no flow monitor *monitor-name*

Syntax Description	*monitor-name* Name of the flow monitor that is being created or modified.

Command Default   flow monitors are not present in the configuration.

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   Flow monitors are the component that is applied to interfaces to perform network traffic monitoring. Flow monitors consist of a flow record and a cache. You add the record to the flow monitor after you create the flow monitor. The flow monitor cache is automatically created at the time the flow monitor is applied to the first interface. Flow data is collected from the network traffic during the monitoring process based on the key and nonkey fields in the flow monitor's record and stored in the flow monitor cache.

Examples   The following example creates a flow monitor named FLOW-MONITOR-1 and enters flow monitor configuration mode:

```
Device(config)# flow monitor FLOW-MONITOR-1
Device(config-flow-monitor)#
```

flow record

To create a flow record, or to modify an existing flow record, and enter flow record configuration mode, use the **flow record** command in global configuration mode. To remove a record, use the **no** form of this command.

flow record *record-name*
no flow record *record-name*

Syntax Description	*record-name*	Name of the flow record that is being created or modified.

Command Default A flow record is not configured.

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines A flow record defines the keys that uses to identify packets in the flow, as well as other fields of interest that gathers for the flow. You can define a flow record with any combination of keys and fields of interest. The supports a rich set of keys. A flow record also defines the types of counters gathered per flow. You can configure 64-bit packet or byte counters.

Examples The following example creates a flow record named FLOW-RECORD-1, and enters flow record configuration mode:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)#
```

full-sector-dfs (mesh)

To configure mesh full sector Dynamic Frequency Selection (DFS) status for a mesh AP profile, use the **full-sector-dfs** command.

full-sector-dfs

Syntax Description	This command has no keywords or arguments.

Command Default Full sector DFS is enabled.

Command Modes config-wireless-mesh-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to configure mesh full sector DFS status for a mesh AP profile:

```
Device # configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device (config)# wireless profile mesh mesh-profile
Device (config-wireless-mesh-profile)# full-sector-dfs
```

Configuration Commands: g to z

gas-ap-rate-limit

To set the number of Generic Advertisement Service (GAS) or Access Network Query Protocol (ANQP) request action frames sent to the controller by an access point (AP) for a given duration, use the **gas-ap-rate-limit** command.

gas-ap-rate-limit *number-of-requests request-limit-interval*

Syntax Description	*number-of-requests*	Number of GAS or ANQP requests allowed in a given interval. Valid range is from 1-100.
	request-limit-interval	Interval in which the maximum numbers of requests is applicable. Valid range is from 100-1000 milliseconds.

Command Default	Limit is not enabled.

Command Modes	AP Profile Configuration (config-ap-profile)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure the number of GAS or ANQP request action frames sent to the controller by an AP for a given duration:

```
Device(config)# ap profile hotspot
Device(config-ap-profile)# gas-ap-rate-limit 12 120
```

group

To configure a group for a venue and a venue type, use the **group** command. To remove the group, use the **no** form of the command.

group *venue-group venue-type*

Syntax Description	*venue-group*	Venue group. Options are: **assembly**, **business**, **educational**, **industrial**, **institutional**, **mercantile**, **outdoor**, **residential**, **storage**, **unspecified**, **utility**, and **vehicular**.
	venue-type	Venue type. The options vary based on the venue-group.

Command Default	None

Command Modes	Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History	

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure a group for a venue and a venue type:

```
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# group business bank
```

gtk-randomize

To configure random-GTK for hole-196 mitigation, use the **gtk-randomize** command. Use the **no** form of the command to remove the icon.

gtk-randomize

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

WLAN Configuration (config-wlan)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines

The GTK used for each mobile device should be different from every GTK used for the other mobile devices associated to the BSS.

Example

The following example shows how to configure random-GTK for hole-196 mitigation.

```
Device(config-wlan)# security wpa wpa2 gtk-randomize
```

gnxi (Insecure Mode)

gNXI is a collection of tools for Network Management that use the gNMI and gNOI protocols. They are:

- gNMI - gRPC Network Management Interface

- gNOI - gRPC Network Operations Interface

gNMI is gRPC Network Management Interface developed by Google. gNMI provides the mechanism to install, manipulate, and delete the configuration of network devices, and also to view operational data. gRPC Network Operations Interface (gNOI) defines a set of gRPC-based micro-services for executing operational commands on network devices.

To configure and start gNXI process in an insecure mode, use the **gnxi** command. To disable this feature, use the **no** form of the command.

gnxi {port *port-number* **| secure-client-auth | seure-init | secure-password-auth | secure-peer-verify-trustpoint | secure-port | secure-server | secure-trustpoint | server}**

no gnxi {port *port-number* **| secure-client-auth | seure-init | secure-password-auth | secure-peer-verify-trustpoint | secure-port | secure-server | secure-trustpoint | server}**

Syntax Description	**gnxi**	Starts the gNXI process
	port	Configures the gNXI server port
	port-number	Specifies the port number. The default port number is 50052.
	secure-client-auth	Configures the gNXI with client authentication
	secure-init	Enables the gNMI secure server by using the primary self-signed certificate
	secure-password-auth	Configures the gNXI with password authentication
	secure-peer-verify-trustpoint	Configures the gNXI server peer validation trustpoint
	secure-port	Configures the gNXI secure server port
	secure-server	Enables the gNXI secure server
	secure-trustpoint	Configures the gNXI server certificate trustpoint
	server	Enables the gNXI server

Command Default	None
Command Modes	Global Configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Examples

The following example shows how to configure the gNIX server (Insecure Mode):

```
Device# configure terminal
Device(config)# gnxi server
Device(config)# end
```

gnxi (Secure Mode)

gNXI is a collection of tools for Network Management that use the gNMI and gNOI protocols. They are:

- gNMI - gRPC Network Management Interface

- gNOI - gRPC Network Operations Interface

gNMI is gRPC Network Management Interface developed by Google. gNMI provides the mechanism to install, manipulate, and delete the configuration of network devices, and also to view operational data. gRPC Network Operations Interface (gNOI) defines a set of gRPC-based micro-services for executing operational commands on network devices.

To configure and start gNXI process in a secure mode, use the **gnxi** command. To disable this feature, use the **no** form of the command.

gnxi {secure-server | secure-trustpoint *trustpoint-name* **| secure-client-auth | secure-port}**

no gnxi {secure-server | secure-trustpoint *trustpoint-name* **| secure-client-auth | secure-port}**

Syntax Description	**gnxi**	Starts the gNXI process
	secure-server	Enables the gNXI secure server
	secure-trustpoint	Configures the gNXI server certificate trustpoint
	trustpoint-name	Specifies the trustpoint name
	secure-client-auth	Configures the gNXI with client authentication
	secure-port	Configures the gNXI secure server port

Command Default	None

Command Modes	Global Configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Examples

The following example shows how to configure the gNIX server and the secure trustpoint in a secure mode:

```
Device# configure terminal
Device(config)# gnxi secure-trustpoint <trustpoint-name>
Device(config)# end
```

hessid

To configure a homogenous extended service set, use the **hessid** command. To remove the service set, use the **no** form of the command.

hessid *HESSID-value*

Syntax Description	*HESSID-value*	HESSID value.

Command Default	None

Command Modes	Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure a homogenous extended service set:

```
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# hessid 00:40:96:b4:82:55
```

high-density clients count

To configure the maximum number of client connections per AP radio, use the **high-density clients count** command in the RF profile mode. Use the **no** form of this command to disable the feature.

high-density clients count *max-client-conn-per-radio*

[no] high-density clients count *max-client-conn-per-radio*

Syntax Description	*max-client-conn-per-radio*	Configures the maximum number of client connections per AP radio. The valid range is between 0 and 400. The default value is 200 client connections.

Command Default None

Command Modes RF configuration mode

Command History

Release	Modification
Cisco IOS XE Cupertino 17.8.1	This command was introduced.

Example

The following example explains how to configure the maximum number of client connections per AP radio.

```
Device(config)# ap dot11 5ghz rf-profile rfprofile
Device(config-rf-profile)# high-density clients count 30
```

hotspot anqp-server

To associate a hotspot server with a policy profile, use the **hotspot anqp-server** command. To remove the server, use the **no** form of the command.

hotspot anqp-server *server-name*

Syntax Description

server-name	Name of the Hotspot 2.0 ANQP server.

Command Default   None

Command Modes   Wireless Policy Configuration (config-wireless-policy)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure a Hotspot 2.0 ANQP server:

```
Device(config)# wireless profile policy hs-policy
Device(config-wireless-policy)# hotspot anqp-server test
```

hyperlocation

To configure Hyperlocation and related parameters for an AP group, use the **hyperlocation** command in the WLAN AP Group configuration (`Device(config-apgroup)#`) mode. To disable Hyperlocation and related parameter configuration for the AP group, use the **no** form of the command.

[no] hyperlocation [**threshold** {**detection** *value-in-dBm* | **reset** *value-btwn-0-99* | **trigger** *value-btwn-1-100*}]

Syntax Description	**[no] hyperlocation**	Enables or disables Hyperlocation for an AP group.
	threshold detection *value-in-dBm*	Sets threshold to filter out packets with low RSSI. The **[no]** form of the command resets the threshold to its default value.
	threshold reset *value-btwn-0-99*	Resets value in scan cycles after trigger. The **[no]** form of the command resets the threshold to its default value.
	threshold trigger *value-btwn-1-100*	Sets the number of scan cycles before sending a BAR to clients. The **[no]** form of the command resets the threshold to its default value.
		Note Ensure that the Hyperlocation threshold reset value is less than the threshold trigger value.

Command Modes	WLAN AP Group configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

• This example shows how to set threshold to filter out packets with low RSSI:

```
Device(config-apgroup)# [no] hyperlocation threshold detection -100
```

• This example shows how to reset value in scan cycles after trigger:

```
Device(config-apgroup)# [no] hyperlocation threshold reset 8
```

• This example shows how to set the number of scan cycles before sending a BAR to clients:

```
Device(config-apgroup)# [no] hyperlocation threshold trigger 10
```

icon

To configure an icon for an Online Sign-Up (OSU) provider, use the **icon** command. To remove the icon, use the **no** form of the command.

icon *file-name*

Syntax Description	*file-name*	File name of the icon.

Command Default   None

Command Modes   ANQP OSU Provider Configuration (config-anqp-osu-provider)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines   The icon must be configured under the hotspot ANQP server.

Example

The following example shows how to configure an icon for the OSU provider:

```
Device(config-wireless-anqp-server)# osu-provider my-osu
Device(config-anqp-osu-provider)# icon test
```

idle-timeout

To configure the idle-timeout value in seconds for a wireless profile policy, use the **idle-timeout** command.

idle-timeout *value*

Syntax Description	*value*	Sets the idle-timeout value. Valid range is 15 to 100000 seconds.

Command Default   None

Command Modes   config-wireless-policy

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to set the idle-timeout in a wireless profile policy:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy policy-profile-name
Device(config-wireless-policy)# idle-timeout 100
```

ids (mesh)

To configure IDS (Rogue/Signature Detection) reporting for outdoor mesh APs, use the **ids** command.

ids

Syntax Description	This command has no keywords or arguments.

Command Default   IDS is disabled.

Command Modes   config-wireless-mesh-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to configure IDS (Rogue/Signature Detection) reporting for outdoor mesh APs:

```
Device # configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device (config)# wireless profile mesh mesh-profile
Device (config-wireless-mesh-profile)# ids
```

inactive-timeout

To enable in-active timer, use the **inactive-timeout** command.

inactive-timeout *timeout-in-seconds*

Syntax Description

timeout-in-seconds	Specifies the inactive flow timeout value. The range is from 1 to 604800.

Command Default None

Command Modes ET-Analytics configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to enable in-active timer in the ET-Analytics configuration mode:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# et-analytics
Device(config-et-analytics)# inactive-timeout 15
Device(config-et-analytics)# end
```

inner-auth-eap

To configure inner authentication Extensible Authentication Protocol (EAP) method, use the **inner-auth-eap** command. To remove the inner authentication EAP method, use the **no** form of the command.

inner-auth-eap {**eap-aka** | **eap-fast** | **eap-leap** | **eap-peap** | **eap-sim** | **eap-tls** | **eap-ttls**}

Syntax Description		
	eap-aka	Enables EAP authentication and key agreement method.
		EAP-AKA is an EAP mechanism for authentication and session key distribution using the UMTS Subscriber Identity Module.
	eap-fast	Enables EAP flexible authentication through the secure tunneling method.
		EAP-FAST is a flexible EAP protocol that allows mutual authentication of a supplicant and a server. It is similar to EAP-PEAP, but typically does not require the use of client or server certificates.
	eap-leap	Enables EAP lightweight extensible authentication protocol method.
		EAP-LEAP is an EAP authentication protocol used primarily in Cisco Aironet WLANs. It encrypts data transmissions using dynamically generated wired equivalent privacy (WEP) keys, and supports mutual authentication.
	eap-peap	Enables EAP-protected extensible authentication protocol method.
		EAP-PEAP is an EAP authentication protocol used in wireless networks and point-to-point connections. PEAP is designed to provide more secure authentication for 802.11 WLANs that support 802.1X port access control.
	eap-sim	Enables EAP subscriber identity module method.
		EAP-SIM is an EAP authentication protocol used for authentication and session key distribution using the subscriber identity module (SIM) from the Global System for Mobile Communications (GSM).
	eap-tls	Enables EAP transport layer security method.
		EAP-TLS is an EAP authentication protocol, and an IETF open standard that uses the Transport Layer Security (TLS) protocol. EAP-TLS is the original, standard wireless LAN EAP authentication protocol.
	eap-ttls	Enables EAP-tunneled transport layer security method.
		EAP-TTLS is a simple WPA2-Enterprise Wi-Fi authentication method that has been a standard system for many years. When a user wants to connect to the network, the device initiates communication with the network and confirms that it is the correct network by identifying the server certificate.

Command Default   None

Command Modes   ANQP NAI EAP Authentication Configuration (config-anqp-nai-eap-auth)

Command History	Release	Modification
	Cisco IOS XE Amsterdam 17.3.1	This command was introduced in a release earlier than Cisco IOS XE Amsterdam 17.3.1.

Usage Guidelines

Prior to Cisco IOS XE Amsterdam 17.3.1, only one inner EAP authentication method was allowed. For example, **inner-auth-eap eap-aka**. If you use multiple inner EAP authentication methods such as **inner-auth-eap eap-aka** and **inner-auth-eap eap-fast**, then only the last method is used, and previous one was discarded. From Cisco IOS XE Amsterdam 17.3.1 onwards, you can configure multiple inner EAP authentication methods. For an example, see the code snippet given below:

```
wireless hotspot anqp-server my_anqp
nai-realm myvenue.cisco.com
eap-method eap-aka
credential certificate
credential usim
inner-auth-eap eap-aka
inner-auth-eap eap-fast
inner-auth-non-eap chap
inner-auth-non-eap pap
tunneled-eap-credential anonymous
tunneled-eap-credential softoken
```

Example

The following example shows how to configure the inner authentication EAP method:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless hotspot anqp-server my_anqp
Device(config-wireless-anqp-server)# nai-realm myvenue.cisco.com
Device(config-anqp-nai-eap)# eap-method eap-aka
Device(config-anqp-nai-eap-auth)#inner-auth-eap eap-aka
```

inner-auth-non-eap

To configure the inner authentication non-Extensible Authentication Protocol (EAP) method, use the **inner-auth-non-eap** command. To remove the inner authentication non-EAP method, use the **no** form of this command.

inner-auth-non-eap {**chap** | **mschap** | **mschap-v2** | **pap**}

Syntax Description	chap	Challenge handshake authentication protocol method.
		CHAP is an authentication scheme used by Point-to-Point Protocol (PPP) servers to validate the identity of remote clients. CHAP periodically verifies the identity of a client by using a three-way handshake.
	mschap	Microsoft challenge handshake authentication protocol method.
	mschap-v2	Microsoft challenge handshake authentication protocol Version 2 method.
	pap	Password authentication protocol method.
		PAP is a password-based authentication protocol used by PPP to validate users.

Command Default None

Command Modes ANQP NAI EAP Authentication Configuration (config-anqp-nai-eap-auth)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

The following example shows how to configure the inner authentication non-EAP method:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless hotspot anqp-server my_anqp
Device(config-wireless-anqp-server)# nai-realm myvenue.cisco.com
Device(config-anqp-nai-eap)# eap-method eap-aka
Device(config-anqp-nai-eap-auth)#inner-auth-eap pap
```

install abort

To cancel an ongoing predownload or rolling access point (AP) upgrade operation, use the **install abort** command.

install abort issu

Syntax Description	**issu** Forces the operation to use the In-Service Software Upgrade (ISSU) technique.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Usage Guidelines   The **install abort** command ensures that the APs with or without the predownload image do not reboot and continue to have the image in their partition.

Examples   The following example shows how to cancel a current predownload or install operation:

```
Device# install abort issu
```

install add file activate commit

To activate an installed SMU package and to commit the changes to the loadpath, use the **install add file activate commit** command.

install add file activate commit

Syntax Description	**prompt-level**	Sets the prompt level.
	none	Prompting is not done.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

The following example shows how to activate an installed package and commit the changes:

```
Device# install add file vwlc_apsp_16.11.1.0_74.bin activate commit
```

install add file flash activate issu commit

To activate the installed package using issu technique and to commit the changes to the loadpath, use the **install add file flash activate issu commit** command.

install add file flash activate issu commit

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to activate the installed package using issu technique and to commit the changes to the loadpath:

```
Device# install add file flash activate issu commit
```

install add profile

To select the profile to rollback the AP images with AP image predownload support, use the **install add profile** command.

install add profile *profile-name* [**activate**]

Syntax Description

profile-name	Profile name. The profile name can have a maximum of only 15 characters.
activate	Activates the installed package.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to select the profile to rollback the AP images:

```
Device# install add profile profile1
```

install activate

To activate an installed package, use the **install activate** command.

install   activate {**auto-abort-timer** | **file** | **profile** | **prompt-level**}

Syntax Description	**auto-abort-timer**	Sets the cancel timer. The time range is between 30 and 1200 minutes.
	file	Specifies the package to be activated.
	profile	Specifies the profile to be activated.
	prompt-level	Sets the prompt level.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	**Modification**
Cisco IOS XE Gibraltar 16.12.2s	This command was introduced.

Example

The following example shows how to activate the installed package:

```
Device# install activate profile default
install_activate: START Thu Nov 24 20:14:53 UTC 2019

System configuration has been modified.
Press Yes(y) to save the configuration and proceed.
Press No(n) for proceeding without saving the configuration.
Press Quit(q) to exit, you may save configuration and re-enter the command. [y/n/q] y
Building configuration...
[OK]Modified configuration has been saved
Jan 24 20:15:02.745: %INSTALL-5-INSTALL_START_INFO: R0/0: install_engine: Started install
activate
Jan 24 20:15:02.745 %INSTALL-5-INSTALL_START_INFO: R0/0: install_engine: Started install
activate
install_activate: Activating PACKAGE
```

install activate profile

To activate an installed package, use the **install activate profile** command.

install activate profile

Syntax Description

profile	To activate the profile.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.2s	This command was introduced.

Example

The following example shows how to activate the installed package:

```
Device#install activate profile default
install_activate: START Thu Nov 24 20:14:53 UTC 2019

System configuration has been modified.
Press Yes(y) to save the configuration and proceed.
Press No(n) for proceeding without saving the configuration.
Press Quit(q) to exit, you may save configuration and re-enter the command. [y/n/q] y
Building configuration...
[OK]Modified configuration has been saved
Jan 24 20:15:02.745: %INSTALL-5-INSTALL_START_INFO: R0/0: install_engine: Started install
activate
Jan 24 20:15:02.745 %INSTALL-5-INSTALL_START_INFO: R0/0: install_engine: Started install
activate
install_activate: Activating PACKAGE
```

install activate file

To activate an installed package, use the **install activate file** command.

install activate file *file-name*

Syntax Description

file-name	Specifies the package name. Options are: bootflash:, flash:, and webui:.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

The following example shows how to use an auto cancel timer while activating an install package on a standby location:

```
Device# install activate file vwlc_apsp_16.11.1.0_74.bin
```

install commit

To commit the changes to the loadpath, use the **install commit** command.

install commit

Syntax Description	This command has no keywords or arguments.

Command Default	None

Command Modes	Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

The following example shows how to commit the changes to the loadpath:

```
Device# install commit
```

install remove profile default

To specify an install package that is to be removed, use the **install remove profile default** command.

install remove profile default

Syntax Description	**remove**	Removes the install package.
	profile	Specifies the profile to be removed.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

The following example shows how to remove a default profile:

```
Device# install remove profile default
```

install deactivate

To specify an install package that is to be deactivated, use the **install deactivate file** command.

install deactivate file   *file-name*

Syntax Description

file-name	Specifies the package name. Options are: bootflash:, flash:, and webui:.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

The following example shows how to deactivate an install package:

```
Device# install deactivate file vwlc_apsp_16.11.1.0_74.bin
```

install deactivate

To specify an install package that is to be deactivated, use the **install deactivate file** command.

install deactivate file *file-name*

Syntax Description

file-name	Specifies the package name. Options are: bootflash:, flash:, and webui:.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

The following example shows how to deactivate an install package:

```
Device# install deactivate file vwlc_apsp_16.11.1.0_74.bin
```

install prepare

To prepare a SMU package to cancel, activate, or deactivate an operation, use the **install prepare** command.

install prepare {**abort** | **activate file** *file-name* | **deactivate file** *file-name* }

Syntax Description	**abort**	Prepares a SMU package for cancel operation.
	activate file	Prepares a SMU package for activation.
	file-name	Package name.
	deactivate file	Prepares a SMU package for deactivation.

Command Default	None

Command Modes	Privileged EXEC (#)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

The following example shows how to prepare a package for cancel, activate, or deactivate operation:

```
Device# install prepare abort
Device# install prepare activate file vwlc_apsp_16.11.1.0_74.bin
Device# install prepare deactivate file vwlc_apsp_16.11.1.0_74.bin
```

install prepare rollback

To prepare a SMU package for rollback operation, use the **install prepare rollback** command.

install prepare rollback to{**base** |**committed** |**id** *id*|**label** *label*}

Syntax Description	**base**	Prepares to roll back to the base image.
	committed	Prepares to roll back to the last committed installation point.
	id	Prepares rollback to the last committed installation point.
	id	The identifier of the install point to roll back to.
	label	Prepares to roll back to a specific install point label.
	label	Label name, with a maximum of 15 characters.

Command Default	None
Command Modes	Privileged EXEC (#)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to prepare a package for roll back to a particular id:

```
Device# install prepare rollback to id 2
```

install rollback

To roll back to a particular installation point, use the **install rollback** command.

install rollback to {**base** | **committed** | **id** *id* | **label** *label*} [**prompt-level none**]

Syntax Description	base	Rolls back to the base image.
	prompt-level none	Sets the prompt level as none.
	committed	Rolls back to the last committed installation point.
	id	Rolls back to a specific install point ID.
	label	Rolls back to a specific install point label.

Command Default	None

Command Modes	Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

The following example shows how to specify the ID of the install point to roll back to:

```
Device# install rollback to id 1
```

interface vlan

To create or access a dynamic switch virtual interface (SVI) and to enter interface configuration mode, use the **interface vlan** command in global configuration mode. To delete an SVI, use the **no** form of this command.

interface vlan *vlan-id*
no interface vlan *vlan-id*

Syntax Description	*vlan-id* VLAN number. The range is 1 to 4094.

Command Default The default VLAN interface is VLAN 1.

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines SVIs are created the first time you enter the **interface vlan** *vlan-id* command for a particular VLAN. The *vlan-id* corresponds to the VLAN-tag associated with data frames on an IEEE 802.1Q encapsulated trunk or the VLAN ID configured for an access port.

Note When you create an SVI, it does not become active until it is associated with a physical port.

If you delete an SVI using the **no interface vlan** *vlan-id* command, it is no longer visible in the output from the **show interfaces** privileged EXEC command.

Note You cannot delete the VLAN 1 interface.

You can reinstate a deleted SVI by entering the **interface vlan** *vlan-id* command for the deleted interface. The interface comes back up, but the previous configuration is gone.

The interrelationship between the number of SVIs configured on a chassis or a chassis stack and the number of other features being configured might have an impact on CPU utilization due to hardware limitations. You can use the **sdm prefer** global configuration command to reallocate system hardware resources based on templates and feature tables.

You can verify your setting by entering the **show interfaces** and **show interfaces vlan** *vlan-id* privileged EXEC commands.

This example shows how to create a new SVI with VLAN ID 23 and enter interface configuration mode:

```
Device(config)# interface vlan 23
Device(config-if)#
```

ip access-group

To configure WLAN access control group (ACL), use the **ip access-group** command. To remove a WLAN ACL group, use the **no** form of the command.

ip access-group [**web**] *acl-name*
no ip access-group [**web**]

Syntax Description	**web**	(Optional) Configures the IPv4 web ACL.
	acl-name	Specify the preauth ACL used for the WLAN with the security type value as webauth.

Command Default   None

Command Modes   WLAN configuration

Usage Guidelines   You must disable the WLAN before using this command. See Related Commands section for more information on how to disable a WLAN.

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure a WLAN ACL:

```
Device#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)#wlan wlan1
Device(config-wlan)#ip access-group test-acl
```

This example shows how to configure an IPv4 WLAN web ACL:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wlan wlan1
Device(config-wlan)# ip access-group web test
Device(config-wlan)#
```

ip access-list extended

To configure extended access list, use the **ip access-list extended** command.

ip access-list extended {**<100-199>** | **<2000-2699>** *access-list-name*}

Syntax Description	**<100-199>**	Extended IP access-list number.
	<2000-2699>	Extended IP access-list number (expanded range).

Command Default	None

Command Modes	Global configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure extended access list:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ip access-list extended access-list-name
```

ip address

To set a primary or secondary IP address for an interface, use the **ip address** command in interface configuration mode. To remove an IP address or disable IP processing, use the noform of this command.

ip address *ip-address* *mask* [**secondary** [**vrf** *vrf-name*]]
no ip address *ip-address* *mask* [**secondary** [**vrf** *vrf-name*]]

Syntax Description

ip-address	IP address.
mask	Mask for the associated IP subnet.
secondary	(Optional) Specifies that the configured address is a secondary IP address. If this keyword is omitted, the configured address is the primary IP address. **Note** If the secondary address is used for a VRF table configuration with the **vrf** keyword, the **vrf** keyword must be specified also.
vrf	(Optional) Name of the VRF table. The *vrf-name* argument specifies the VRF name of the ingress interface.

Command Default No IP address is defined for the interface.

Command Modes Interface configuration (config-if)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines An interface can have one primary IP address and multiple secondary IP addresses. Packets generated by the Cisco IOS software always use the primary IP address. Therefore, all devices and access servers on a segment should share the same primary network number.

Hosts can determine subnet masks using the Internet Control Message Protocol (ICMP) mask request message. Devices respond to this request with an ICMP mask reply message.

You can disable IP processing on a particular interface by removing its IP address with the **no ip address** command. If the software detects another host using one of its IP addresses, it will print an error message on the console.

The optional **secondary** keyword allows you to specify an unlimited number of secondary addresses. Secondary addresses are treated like primary addresses, except the system never generates datagrams other than routing updates with secondary source addresses. IP broadcasts and Address Resolution Protocol (ARP) requests are handled properly, as are interface routes in the IP routing table.

Secondary IP addresses can be used in a variety of situations. The following are the most common applications:

- There may not be enough host addresses for a particular network segment. For example, your subnetting allows up to 254 hosts per logical subnet, but on one physical subnet you need 300 host addresses. Using

secondary IP addresses on the devices or access servers allows you to have two logical subnets using one physical subnet.

- Many older networks were built using Level 2 bridges. The judicious use of secondary addresses can aid in the transition to a subnetted, device-based network. Devices on an older, bridged segment can be easily made aware that many subnets are on that segment.

- Two subnets of a single network might otherwise be separated by another network. This situation is not permitted when subnets are in use. In these instances, the first network is *extended*, or layered on top of the second network using secondary addresses.

Note
- If any device on a network segment uses a secondary address, all other devices on that same segment must also use a secondary address from the same network or subnet. Inconsistent use of secondary addresses on a network segment can very quickly cause routing loops.

- When you are routing using the Open Shortest Path First (OSPF) algorithm, ensure that all secondary addresses of an interface fall into the same OSPF area as the primary addresses.

- If you configure a secondary IP address, you must disable sending ICMP redirect messages by entering the **no ip redirects** command, to avoid high CPU utilization.

Examples

In the following example, 192.108.1.27 is the primary address and 192.31.7.17 is the secondary address for GigabitEthernet interface 1/0/1:

```
Device# enable
Device# configure terminal
Device(config)# interface GigabitEthernet 1/0/1
Device(config-if)# ip address 192.108.1.27 255.255.255.0
Device(config-if)# ip address 192.31.7.17 255.255.255.0 secondary
```

Related Commands

Command	Description
match ip route-source	Specifies a source IP address to match to required route maps that have been set up based on VRF connected routes.
route-map	Defines the conditions for redistributing routes from one routing protocol into another, or to enable policy routing.
set vrf	Enables VPN VRF selection within a route map for policy-based routing VRF selection.
show ip arp	Displays the ARP cache, in which SLIP addresses appear as permanent ARP table entries.
show ip interface	Displays the usability status of interfaces configured for IP.
show route-map	Displays static and dynamic route maps.

ip arp-limit rate

To configure rate limiting for Address Resolution Protocol (ARP) packets, use the **ip arp-limit rate** command.

ip arp-limit rate { **burst-interval** *burst-interval* | **none** | **pps** *pps* }

Syntax Description		
pps	The maximum number of ARP packets allowed for a client per second. If packets received per client exceeds the configured limit, they are dropped. Valid values range from 15 to 1500, with a default value of 100 seconds.	
burst-interval	The burst interval in seconds for excluding client. The client gets block-listed when the ARP pps crosses the configured value. Valid values range from 3 to 255, with a default value of 5 seconds.	
none	Disables the ARP rate-limiting.	

Command Default Default values are configured.

Command Modes Wireless Policy Profile Configuration (config-wireless-policy)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.5	This command was introduced.

Usage Guidelines This command is only available in the following releases: Cisco IOS XE Amsterdam 17.3.5 and later, Cisco IOS XE Bengaluru 17.6.3 and later, and Cisco IOS XE Cupertino 17.8.1 and above.

For RLAN, the default values are used. You cannot change the values using this command.

Examples The following example shows how to configure rate limiting for ARP packets:

```
Device# configure terminal
Device(config)# wireless profile policy test1
Device(config-wireless-policy)# ip arp-limit rate pps 90
```

ip admission

To enable web authentication, use the **ip admission** command in interface configuration mode. You can also use this command in fallback-profile configuration mode. To disable web authentication, use the **no** form of this command.

ip admission *rule*
no ip admission *rule*

Syntax Description	*rule*	IP admission rule name.

Command Default Web authentication is disabled.

Command Modes Interface configuration

Fallback-profile configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines The **ip admission** command applies a web authentication rule to a switch port.

This example shows how to apply a web authentication rule to a switchport:

```
Device# configure terminal
Device(config)# interface gigabitethernet1/0/1
Device(config-if)# ip admission rule1
```

This example shows how to apply a web authentication rule to a fallback profile for use on an IEEE 802.1x enabled switch port.

```
Device# configure terminal
Device(config)# fallback profile profile1
Device(config-fallback-profile)# ip admission rule1
```

ip dhcp pool

To configure a Dynamic Host Configuration Protocol (DHCP) address pool on a DHCP server and enter DHCP pool configuration mode, use the **ip dhcp pool** command in global configuration mode. To remove the address pool, use the no form of this command.

ip dhcp pool *name*
no ip dhcp pool *name*

Note   When configuring the **ip dhcp pool** command, note that it can be affected by the **ip dhcp database** command if an incorrect URL is provided. The console may hang due to multiple attempts by the DHCP service to reach the URL before it returns a failure. This is expected behavior. To prevent this issue, ensure that the correct URL, including the file name, is provided when using the **ip dhcp database** command, especially when it includes ftp/tftp.

Syntax Description	*name*	Name of the pool. Can either be a symbolic string (such as engineering) or an integer (such as 0).

Command Default   DHCP address pools are not configured.

Command Modes   Global configuration

Command History

Release	Modification
12.0(1)T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   During execution of this command, the configuration mode changes to DHCP pool configuration mode, which is identified by the (config-dhcp)# prompt. In this mode, the administrator can configure pool parameters, like the IP subnet number and default router list.

Examples   The following example configures pool1 as the DHCP address pool:

```
ip dhcp pool pool1
```

Related Commands

Command	Description
host	Specifies the IP address and network mask for a manual binding to a DHCP client.
ip dhcp excluded-address	Specifies IP addresses that a Cisco IOS DHCP server should not assign to DHCP clients.

Command	Description
network (DHCP)	Configures the subnet number and mask for a DHCP address pool on a Cisco IOS DHCP server.

ip dhcp-relay information option server-override

To enable the system to globally insert the server ID override and link selection suboptions into the DHCP relay agent information option in forwarded BOOTREQUEST messages to a Dynamic Host Configuration Protocol (DHCP) server, use the **ip dhcp-relay information option server-override** command in global configuration mode. To disable inserting the server ID override and link selection suboptions into the DHCP relay agent information option, use the **no** form of this command.

ip dhcp-relay information option server-override
no ip dhcp-relay information option server-override

Syntax Description   This command has no arguments or keywords.

Command Default   The server ID override and link selection suboptions are not inserted into the DHCP relay agent information option.

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Aggregation Services Routers.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
15.1(1)SY	This command was integrated into Cisco IOS Release 15.1(1)SY.

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines   The **ip dhcp-relay information option server-override** command adds the following suboptions into the relay agent information option when DHCP broadcasts are forwarded by the relay agent from clients to a DHCP server:

- Server ID override suboption

- Link selection suboption

When this command is configured, the gateway address (giaddr) will be set to the IP address of the outgoing interface, which is the interface that is reachable by the DHCP server.

If the **ip dhcp relay information option server-id-override** command is configured on an interface, it overrides the global configuration on that interface only.

Examples   In the following example, the DHCP relay will insert the server ID override and link selection suboptions into the relay information option of the DHCP packet. The loopback interface IP address is configured to be the source IP address for the relayed messages.

```
Device(config)# ip dhcp-relay information option server-override
Device(config)# ip dhcp-relay source-interface loopback 0
Device(config)# interface Loopback 0
Device(config-if)# ip address 10.2.2.1 255.255.255.0
```

Related Commands	Command	Description
	ip dhcp relay information option server-id-override	Enables the system to insert the server ID override and link selection suboptions on a specific interface into the DHCP relay agent information option in forwarded BOOTREQUEST messages to a DHCP server.

ip dhcp-relay source-interface

To globally configure the source interface for the relay agent to use as the source IP address for relayed messages, use the **ip dhcp-relay source-interface** command in global configuration mode. To remove the source interface configuration, use the **no** form of this command.

ip dhcp-relay source-interface *type number*
no ip dhcp-relay source-interface *type number*

Syntax Description

type	Interface type. For more information, use the question mark (?) online help function.
number	Interface or subinterface number. For more information about the numbering system for your networking device, use the question mark (?) online help function.

Command Default   The source interface is not configured.

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Aggregation Services Routers.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
15.1(1)SY	This command was integrated into Cisco IOS Release 15.1(1)SY.

Usage Guidelines   The **ip dhcp-relay source-interface** command allows the network administrator to specify a stable, hardware-independent IP address (such as a loopback interface) for the relay agent to use as a source IP address for relayed messages.

If the **ip dhcp-relay source-interface** global configuration command is configured and the **ip dhcp relay source-interface** command is also configured, the **ip dhcp relay source-interface** command takes precedence over the global configuration command. However, the global configuration is applied to interfaces without the interface configuration.

Examples   In the following example, the loopback interface IP address is configured to be the source IP address for the relayed messages:

```
Device(config)# ip dhcp-relay source-interface loopback 0
Device(config)# interface loopback 0
Device(config-if)# ip address 10.2.2.1 255.255.255.0
```

Related Commands

Command	Description
ip dhcp relay source-interface	Configures the source interface for the relay agent to use as the source IP address for relayed messages.

ip dhcp compatibility suboption

To configure the server override and link-selection suboption to an RFC or Cisco specific value, use the **ip dhcp compatibility suboption** [**server-override** | **link-selection**] command.

ip dhcp compatibility suboption server-override [**cisco** | **standard**]
ip dhcp compatibility suboption link-selection [**cisco** | **standard**]

Syntax Description		
server-override	Configures the server override suboption to an RFC or Cisco specific value.	
link-selection	Configures the link-selection suboption to an RFC or Cisco specific value.	

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.4.1	This command was introduced.

Usage Guidelines

This example shows how to configure the DHCP Option 82 through server override:

```
Device# configure terminal
Device(config)# ip dhcp compatibility suboption server-override cisco
Device(config)# ip dhcp compatibility suboption link-selection cisco
Device(config)# end
```

ip domain lookup

To enable IP Domain Name System (DNS)-based hostname-to-address translation, use the **ip domain lookup** command in global configuration mode. To disable DNS-based hostname-to-address translation, use the **no** form of this command.

ip domain lookup [**nsap** | **recursive** | **source-interface** *interface-type-number* | **vrf** *vrf-name* { **source-interface** *interface-type-number* }]

Syntax Description		
nsap	(Optional) Enables IP DNS queries for Connectionless Network Service (CLNS) and Network Service Access Point (NSAP) addresses.
recursive	(Optional) Enables IP DNS recursive lookup.
source-interface *interface-type-number*	(Optional) Specifies the source interface for the DNS resolver. Enter an interface type and number.
vrf *vrf-name*	(Optional) Defines a Virtual Routing and Forwarding (VRF) table. For vrf-name, enter a name for the VRF table.

Command Default IP DNS-based hostname-to-address translation is enabled.

Command Modes Global configuration (config)

Command History	Release	Modification
	Cisco IOS XE Fuji 16.9.2	This command was introduced.
	Cisco IOS XE Dublin 17.12.1	An issue relating to the configuration of the **ip domain lookup source-interface** *interface-type-number* command on Layer 3 physical interfaces was resolved.
		Starting from this release, even if configured on a Layer 3 physical interface, the command is retained across reloads and in case the port mode is changed.

Usage Guidelines If this command is enabled on a device and you execute the **show tcp brief** command, the output may be displayed very slowly.

When both IP and ISO CLNS are enabled on a device, the **ip domain lookup nsap** command allows you to discover a CLNS address without having to specify a full CLNS address, given a hostname.

This command is useful for the **ping** (ISO CLNS) command, and for CLNS Telnet connections.

If you configure the **ip domain lookup source-interface** *interface-type-number* command on a Layer 3 physical interface, note the following: If the port mode is changed or in case of a device reload, the command is automatically removed from running configuration (Refer to the output of the **show running-configuration** privileged EXEC command when this happens). Removal of the command causes DNS queries that use the specified source interface, to be dropped. The only available workaround is to reconfigure the command. Starting with Cisco IOS XE Dublin 17.12.1, this issue is resolved.

Examples The following example shows how to configure IP DNS-based hostname-to-address translation:

```
Device# configure terminal
Device(config)# ip domain lookup
Device(config)# end
```

The following example shows how to configure a source interface for the DNS domain lookup:

```
Device# configure terminal
Device(config)# ip domain lookup source-interface gigabitethernet1/0/2
Device(config)# end
```

ip domain-name

To configure the host domain on the device, use the **ip domain-name** command.

ip domain-name *domain-name* [**vrf** *vrf-name*]

Syntax Description	*domain-name*	Default domain name.
	vrf-name	Specifies the virtual routing and forwarding (VRF) to use to resolve the domain name.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure a host domain in a device:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ip domain-name domain-name
```

ip flow-export destination

To configure ETA flow export destination, use the **ip flow-export destination** command.

ip flow-export destination *ip_address port_number*

Syntax Description

port_number	Port number. The range is from 1 to 65535.

Command Default None

Command Modes ET-Analytics configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure ETA flow export destination in the ET-Analytics configuration mode:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# et-analytics
Device(config-et-analytics)# ip flow-export
destination 120.0.0.1 2055
Device(config-et-analytics)# end
```

ip helper-address

To enable forwarding of User Datagram Protocol (UDP) broadcasts, including Bootstrap Protocol (BOOTP), received on an interface, use the **ip helper-address** command in interface configuration mode. To disable forwarding of broadcast packets to specific addresses, use the**no** form of this command.

ip helper-address[**vrf** *name* | **global**] *address* {[**redundancy** *vrg-name*]}
no ip helper-address [**vrf** *name* | **global**] *address* {[**redundancy** *vrg-name*]}

Syntax Description

vrf *name*	(Optional) Enables the VPN routing and forwarding (VRF) instance and the VRF name.
global	(Optional) Configures a global routing table.
address	Destination broadcast or host address to be used when forwarding UDP broadcasts. There can be more than one helper address per interface.
redundancy *vrg-name*	(Optional) Defines the Virtual Router Group (VRG) name.

Command Default   UDP broadcasts are not forwarded.

Command Modes   Interface configuration (config-if)

Command History

Release	Modification
10.0	This command was introduced.
12.2(4)B	This command was modified. The **vrf** *name* keyword and argument pair and the **global** keyword were added.
12.2(15)T	This command was modified. The **redundancy** *vrg-name* keyword and argument pair was added.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   The **ip forward-protocol** command along with the **ip helper-address** command allows you to control broadcast packets and protocols that are forwarded.

One common application that requires helper addresses is DHCP, which is defined in RFC 1531. To enable BOOTP or DHCP broadcast forwarding for a set of clients, configure a helper address on the router interface connected to the client. The helper address must specify the address of the BOOTP or DHCP server. If you have multiple servers, configure one helper address for each server.

The following conditions must be met for a UDP or IP packet to be able to use the **ip helper-address** command:

   • The MAC address of the received frame must be all-ones broadcast address (ffff.ffff.ffff).

- The IP destination address must be one of the following: all-ones broadcast (255.255.255.255), subnet broadcast for the receiving interface, or major-net broadcast for the receiving interface if the **no ip classless** command is also configured.

- The IP time-to-live (TTL) value must be at least 2.

- The IP protocol must be UDP (17).

- The UDP destination port must be for TFTP, Domain Name System (DNS), Time, NetBIOS, ND, BOOTP or DHCP packet, or a UDP port specified by the **ip forward-protocol udp** command in global configuration mode.

If the DHCP server resides in a VPN or global space that is different from the interface VPN, then the **vrf** *name* or the **global** option allows you to specify the name of the VRF or global space in which the DHCP server resides.

The **ip helper-address vrf** *name address* option uses the address associated with the VRF name regardless of the VRF of the incoming interface. If the **ip helper-address vrf** *name address* command is configured and later the VRF is deleted from the configuration, then all IP helper addresses associated with that VRF name will be removed from the interface configuration.

If the **ip helper-address** *address* command is already configured on an interface with no VRF name configured, and later the interface is configured with the **ip helper-address vrf** *name address* command, then the previously configured **ip helper-address** *address* command is considered to be global.

Note The **ip helper-address** command does not work on an X.25 interface on a destination router because the router cannot determine if the packet was intended as a physical broadcast.

The **service dhcp** command must be configured on the router to enable IP helper statements to work with DHCP. If the command is not configured, the DHCP packets will not be relayed through the IP helper statements. The **service dhcp** command is configured by default.

Examples

The following example shows how to define an address that acts as a helper address:

```
Router(config)# interface ethernet 1
Router(config-if)# ip helper-address 10.24.43.2
```

The following example shows how to define an address that acts as a helper address and is associated with a VRF named host1:

```
Router(config)# interface ethernet 1/0
Router(config-if)# ip helper-address vrf host1 10.25.44.2
```

The following example shows how to define an address that acts as a helper address and is associated with a VRG named group1:

```
Router(config)# interface ethernet 1/0
Router(config-if)# ip helper-address 10.25.45.2 redundancy group1
```

	Command	Description
Related Commands	**ip forward-protocol**	Specifies which protocols and ports the router forwards when forwarding broadcast packets.
	service dhcp	Enables the DHCP server and relay agent features on the router.

ip http authentication

To specify a particular authentication method for HTTP server users, use the **ip http authentication** command in global configuration mode. To disable a configured authentication method, use the **no** form of this command

ip http authentication { **aaa** { **command-authorization** *level list-name* | **exec-authorization** *list-name* | **login-authentication** *list-name* } | **enable** | **local** }

no ip http authentication { **aaa** { **command-authorization** *level list-name* | **exec-authorization** *list-name* | **login-authentication** *list-name* } | **enable** | **local** }

Syntax Description		
	aaa	Indicates that the authentication method used for the authentication, authorization, and accounting (AAA) login service should be used for authentication. The AAA login authentication method is specified by the **aaa authentication login default** command, unless otherwise specified by the **login-authentication** *listname* keyword and argument.
	command-authorization	Sets the authorization method list for commands at the specified privilege level.
	level	Indicates a privilege value from 0 through 15. By default, there are the following three command privilege levels on the router: 1. 0--Includes the **disable** , **enable** , **exit** , **help** , and **logout** commands. 2. 1--Includes all user-level commands at the device prompt (>). 3. 15--Includes all enable-level commands at the device prompt (>).
	list-name	Sets the name of the method list.
	exec-authorization	Sets the method list for EXEC authorization, which applies authorization for starting an EXEC session.
	login-authentication	Sets the method list for login authentication, which enables AAA authentication for logins.
	enable	Indicates that the "enable" password should be used for authentication. (This is the default method.)
	local	ndicates that the login user name, password and privilege level access combination specified in the local system configuration (by the **username** global configuration command) should be used for authentication and authorization.

Command Default	None

Command Modes	Global Configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines

The **ip http authentication** command specifies the authentication method to be used for login when a client connects to the HTTP server. Use of the **aaa** option is recommended. The **enable**, **local**, and **tacacs** methods should be specified using the **aaa authentication login** command.

The "enable" password method is the default HTTP server authentication method. If the enable password is used as the HTTP server login authentication method, the client connects to the HTTP server with a default privilege level of 15.

Examples

The following example shows how to specify that AAA should be used for authentication for HTTP server users. The AAA login method is configured as the "local" username/password authentication method. This example also shows how to specify using the local username database for login authentication and EXEC authorization of HTTP sessions:

```
Device(config)# ip http authentication aaa authentication login LOCALDB local
Device(config)# aaa authorization exec LOCALDB local
Device(config)# ip http authentication aaa login-authentication LOCALDB
Device(config)# ip http authentication aaa exec-authorization LOCALDB
```

ip http auth-retry

To configure the maximum number of authentication retry attempts within a specific time-window, use the **ip http auth-retry** command.

ip http auth-retry *retry_number* **time-window** *time-in-minutes*

Syntax Description	*retry_number*	Specifies the maximum number of authentication retry attempts.
	time-window	Retry time window in minutes.
	time-in-minutes	The time window period in minutes during which the maximum number of authentication retries specified can be attempted.

Command Default	None

Command Modes	Global configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the maximum number of authentication retry attempts as 5 in a time-window of 2 minutes:

```
Device# ip http auth-retry 5 time-window 2
```

ip http active-session-modules

To selectively enable HTTP applications that will service incoming HTTP requests from remote clients, use the **ip http active-session-modules** command. Use the **no** form of this command to return to the default, for which all HTTP services will be enabled.

ip http active-session-modules { *list-name* | **all** | **none** }

no ip http active-session-modules { *list-name* | **all** | **none** }

Syntax Description		
	list-name	Enables only those HTTP services configured in the list identified by the **ip http session-module-list** command to serve HTTP requests. All other HTTP or HTTPS applications on the controller will be disabled.
	all	Enables all HTTP applications to service incoming HTTP requests from remote clients.
	none	Disables all HTTP services.

Command Default If no arguments or keywords are specified, all HTTP services are enabled.

Command Modes Global configuration (config)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines Use the **ip http active-session-modules** command to selectively enable HTTP applications, for servicing incoming HTTP requests from remote clients. With this command, a selected list of applications can be enabled. All the applications can be enabled or none of the applications can be enabled, in other words, all disabled. Use the **ip http session-module-list** command to define a list of HTTP or secure HTTP (HTTPS) application names to be enabled. If an HTTP request is made for a service that is disabled, a 404 error message is displayed in the remote client browser.

Examples The following example shows how to configure a different set of services to be available for HTTP and HTTPS requests. In this example, all HTTP applications are enabled for providing services to remote clients, but for HTTPS services, only the HTTPS applications defined in list1 (Simple Certificate Enrollment Protocol [SCEP] and HOME_PAGE) are enabled:

```
Device# ip http session-module-list list1 SCEP,HOME_PAGE
ip http active-session-modules all
ip http server
ip http secure-server
ip http secure-active-session-modules list1
```

ip http client secure-ciphersuite

To specify the CipherSuite that should be used for encryption over the secure HTTP connection from the client to a remote server, use the **ip http client secure-ciphersuite** command in global configuration mode. To remove a previously configured CipherSuite specification for the client, use the **no** form of this command.

ip http client secure-ciphersuite [**3des-ede-cbc-sha**] [**rc4-128-sha**] [**rc4-128-md5**] [**des-cbc-sha**]
no ip http client secure-ciphersuite

Syntax Description

3des-ede-cbc-sha	SSL_RSA_WITH_3DES_EDE_CBC_SHA--Rivest, Shamir, and Adleman (RSA) key exchange with 3DES and DES-EDE3-CBC for message encryption and Secure Hash Algorithm (SHA) for message digest.
rc4-128-sha	SSL_RSA_WITH_RC4_128_SHA--RSA key exchange (RSA Public Key Cryptography) with RC4 128-bit encryption for message encryption and SHA for message digest.
rc4-128-md5	SSL_RSA_WITH_RC4_128_MD5--RSA key exchange (RSA Public Key Cryptography) with RC4 128-bit encryption for message encryption and Message Digest 5 (MD5) for message digest.
des-cbc-sha	SSL_RSA_WITH_DES_CBC_SHA--RSA key exchange with DES-CBC for message encryption and SHA for message digest.

Command Default

The client and server negotiate the best CipherSuite that they both support from the list of available CipherSuites.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE

Usage Guidelines

This command allows you to restrict the list of CipherSuites (encryption algorithms) that the client offers when connecting to a secure HTTP server. For example, you may want to allow only the most secure CipherSuites to be used.

Unless you have a reason to specify the CipherSuites that should be used, or you are unfamiliar with the details of these CipherSuites, you should leave this command unconfigured and let the server and client negotiate the CipherSuite that they both support (this is the default). The **no** form of this command returns the list of available CipherSuites to the default (that is, all CipherSuites supported on your device are available for negotiation).

Examples

The following example shows how to configure the HTTPS client to use only the SSL_RSA_WITH_3DES_EDE_CBC_SHA CipherSuite:

```
Router(config)# ip http client secure-ciphersuite 3des-ede-cbc-sha
```

ip http secure-ciphersuite

To specify the CipherSuites that should be used by the secure HTTP server when negotiating a connection with a remote client, use the **ip http secure-ciphersuite** command in global configuration mode. To return the configuration to the default set of CipherSuites, use the **no** form of this command.

ip http secure-ciphersuite [**3des-ede-cbc-sha**] [**rc4-128-sha**] [**rc4-128-md5**] [**des-cbc-sha**]
no ip http secure-ciphersuite

Syntax Description

3des-ede-cbc-sha	SSL_RSA_WITH_3DES_EDE_CBC_SHA--Rivest, Shamir, and Adleman (RSA) key exchange with 3DES and DES-EDE3-CBC for message encryption and Secure Hash Algorithm (SHA) for message digest.
rc4-128-sha	SSL_RSA_WITH_RC4_128_SHA --RSA key exchange (RSA Public Key Cryptography) with RC4 128-bit encryption for message encryption and SHA for message digest.
rc4-128-md5	SSL_RSA_WITH_RC4_128_MD5 --RSA key exchange (RSA Public Key Cryptography) with RC4 128-bit encryption for message encryption and Message Digest 5 (MD5) for message digest.
des-cbc-sha	SSL_RSA_WITH_DES_CBC_SHA--RSA key exchange with DES-CBC for message encryption and SHA for message digest.

Command Default

The HTTPS server negotiates the best CipherSuite using the list received from the connecting client.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE

Usage Guidelines

This command is used to restrict the list of CipherSuites (encryption algorithms) that should be used for encryption over the HTTPS connection. For example, you may want to allow only the most secure CipherSuites to be used.

Unless you have a reason to specify the CipherSuites that should be used, or you are unfamiliar with the details of these CipherSuites, you should leave this command unconfigured and let the server and client negotiate the CipherSuite that they both support (this is the default).

The supported CipherSuites vary by Cisco IOS software image. For example, "IP Sec56" ("k8") images support only the SSL_RSA_WITH_DES_CBC_SHA CipherSuite in Cisco IOS Release 12.2(15)T.

In terms of router processing load (speed), the following list ranks the CipherSuites from fastest to slowest (slightly more processing time is required for the more secure and more complex CipherSuites):

1. SSL_RSA_WITH_DES_CBC_SHA

2. SSL_RSA_WITH_RC4_128_MD5

3. SSL_RSA_WITH_RC4_128_SHA

4. SSL_RSA_WITH_3DES_EDE_CBC_SHA

Additional information about these CipherSuites can be found online from sources that document the Secure Sockets Layer (SSL) 3.0 protocol.

Examples

The following exampleshows how to restrictsthe CipherSuites offered to a connecting secure web client:

```
Router(config)# ip http secure-ciphersuite rc4-128-sha rc4-128-md5
```

ip http secure-server

To enable a secure HTTP (HTTPS) server, enter the **ip http secure-server** command in global configuration mode. To disable the HTTPS server, use the **no** form of this command..

ip http secure-server
no ip http secure-server

Syntax Description   This command has no arguments or keywords.

Command Default   The HTTPS server is disabled.

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The HTTPS server uses the Secure Sockets Layer (SSL) version 3.0 protocol.

⚠

Caution   When enabling an HTTPS server, you should always disable the standard HTTP server to prevent unsecured connections to the same services. Disable the standard HTTP server using the **no ip http server** command in global configuration mode (this step is precautionary; typically, the HTTP server is disabled by default).

If a certificate authority (CA) is used for certification, you should declare the CA trustpoint on the routing device before enabling the HTTPS server.

To close HTTP/TCP port 8090, you must disable both the HTTP and HTTPS servers. Enter the **no http server** and the **no http secure-server** commands, respectively.

Examples   In the following example the HTTPS server is enabled, and the (previously configured) CA trustpoint CA-trust-local is specified:

```
Device#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)#ip http secure-server
Device(config)#ip http secure-trustpoint CA-trust-local
Device(config)#end

Device#show ip http server secure status
HTTP secure server status: Enabled
HTTP secure server port: 443
HTTP secure server ciphersuite: 3des-ede-cbc-sha des-cbc-sha rc4-128-md5 rc4-12a
HTTP secure server client authentication: Disabled
HTTP secure server trustpoint: CA-trust-local
```

Related Commands

Command	Description
ip http secure-trustpoint	Specifies the CA trustpoint that should be used for obtaining signed certificates for the HTTPS server.
ip http server	Enables the HTTP server on an IP or IPv6 system, including the Cisco web browser user interface.
show ip http server secure status	Displays the configuration status of the HTTPS server.

ip http server

To enable the HTTP server on your IP or IPv6 system, including the Cisco web browser user interface, enter the **ip http server** command in global configuration mode. To disable the HTTP server, use the **no** form of this command..

ip http server
no ip http server

Syntax Description   This command has no arguments or keywords.

Command Default   The HTTP server uses the standard port 80 by default.

HTTP/TCP port 8090 is open by default.

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The command enables both IPv4 and IPv6 access to the HTTP server. However, an access list configured with the **ip http access-class** command is applied only to IPv4 traffic. IPv6 traffic filtering is not supported.

⚠️

Caution   The standard HTTP server and the secure HTTP (HTTPS) server can run on a system at the same time. If you enable the HTTPS server using the **ip http secure-server** command, disable the standard HTTP server using the **no ip http server** command to ensure that secure data cannot be accessed through the standard HTTP connection.

To close HTTP/TCP port 8090, you must disable both the HTTP and HTTPS servers. Enter the **no http server** and the **no http secure-server** commands, respectively.

Examples   The following example shows how to enable the HTTP server on both IPv4 and IPv6 systems.

After enabling the HTTP server, you can set the base path by specifying the location of the HTML files to be served. HTML files used by the HTTP web server typically reside in system flash memory. Remote URLs can be specified using this command, but use of remote path names (for example, where HTML files are located on a remote TFTP server) is not recommended.

```
Device(config)#ip http server
Device(config)#ip http path flash:
```

Related Commands

Command	Description
ip http access-class	Specifies the access list that should be used to restrict access to the HTTP server.
ip http path	Specifies the base path used to locate files for use by the HTTP server.

Command	Description
ip http secure-server	Enables the HTTPS server.

ip http session-module-list

To define a list of HTTP or secure HTTP application names, use the **ip http session-module-list** command in global configuration mode. To remove the defined list, use the **no** form of this command.

ip http session-module-list *listname prefix1* [*prefix2,...prefixn*]

no ip http session-module-list *listname prefix1* [*prefix2,...prefixn*]

Syntax Description	

listname	Name of the list.
prefix 1	Associated HTTP or HTTPS application names. Prefix strings represent the names of applications, for example, SCEP, WEB_EXEC or HOME_PAGE.
prefix2,...prefixn	(Optional) Additional associated HTTP or HTTPS application names. Each application is separated by a comma.

Command Default   No list of HTTP or HTTPS application names is defined.

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines   Use this command to define a list of HTTP or HTTPS application names. The defined list can then be used by the **ip http active-session-modules** or **ip http secure-active-session-modules** commands to selectively enable HTTP or HTTPS applications, respectively, for servicing incoming HTTP and HTTPS requests from remote clients.

When defining a list of HTTP or HTTPS application names, use the following guidelines:

- A maximum of four lists can be defined on a controller. Attempts to define more than four lists will fail and an error message will be displayed stating the limit restrictions.

- An existing list can be removed using the **no ip http session-module-list** command.

- You cannot reconfigure an existing list. Instead of reconfiguring an existing list, remove the existing list and create a new list with the same name.

- There is no limit to how many application names can be in the list. However, the maximum number of sessions that can be registered with the Cisco IOS HTTP or HTTPS server is 32.

Examples   The following example shows how to configure a different set of services to be available for HTTP and HTTPS requests. In this example, all HTTP applications are enabled for providing services to remote clients, but for HTTPS services, only the HTTPS applications defined in list1 (Simple Certificate Enrollment Protocol [SCEP] and HOME_PAGE) are enabled:

```
Device# ip http session-module-list list1 SCEP,HOME_PAGE
Device# ip http active-session-modules all
```

```
Device# ip http server
Device# ip http secure-server
Device# ip http secure-active-session-modules list1
```

ip igmp snooping

To globally enable Internet Group Management Protocol (IGMP) snooping on the device or to enable it on a per-VLAN basis, use the **ip igmp snooping** global configuration command on the device stack or on a standalone device. To return to the default setting, use the **no** form of this command.

ip igmp snooping [**vlan** *vlan-id*]
no ip igmp snooping [**vlan** *vlan-id*]

Syntax Description	**vlan** *vlan-id*	(Optional) Enables IGMP snooping on the specified VLAN. Ranges are 1—1001 and 1006—4094.

Command Default
IGMP snooping is globally enabled on the device.

IGMP snooping is enabled on VLAN interfaces.

Command Modes
Global configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines
When IGMP snooping is enabled globally, it is enabled in all of the existing VLAN interfaces. When IGMP snooping is globally disabled, it is disabled on all of the existing VLAN interfaces.

VLAN IDs 1002 to 1005 are reserved for Token Ring and FDDI VLANs, and cannot be used in IGMP snooping.

Example

The following example shows how to globally enable IGMP snooping:

```
Device(config)# ip igmp snooping
```

The following example shows how to enable IGMP snooping on VLAN 1:

```
Device(config)# ip igmp snooping vlan 1
```

You can verify your settings by entering the **show ip igmp snooping** command in privileged EXEC mode.

ip mac-binding

To configure the ip-mac binding on the device, use the **ip mac-binding** command. To disable ip-mac binding on the device, use the **no** form of the command

[no] ip mac-binding

Syntax Description   This command has no keywords or arguments.

Command Default   IP MAC binding is enabled.

Command Modes   Wireless Policy Configuration (config-wireless-policy)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.4.1	This command was introduced.

Usage Guidelines   When non-Cisco WGB devices (that do not perform a dot11 association for the wired clients behind them) are connected to a Cisco Catalyst 9800 Series Wireless Controller, the wired clients behind the WGB may not get IP addresses. In such instances, run **no ip mac-binding** and **ipv4 dhcp required** commands on the policy profile. The **ipv4 dhcp required** command ensures that the WGB device performs a DHCP to get the IP address. Besides, you must also enable Passive Client feature and ARP broadcast on the client VLAN.

If WGB and Wired client are configured with Static IP address, then the data received from WGB will not be forwarded. We recommend that you enable DHCP on the WGB (enabling DHCP on the wired client is optional).

A sample configuration is given below:

```
Device# configure terminal
Device(config)# wireless profile policy default-policy-profile
Device(config-wireless-policy)# ipv4 dhcp required
Device(config-wireless-policy)# no ip mac-binding
Device(config-wireless-policy)# passive-client
Device(config-wireless-policy)# exit
Device(config)# vlan configuration 1
Device(config-vlan)# arp broadcast
```

Example

The following example shows how to configure the ip-mac binding.

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# wireless profile policy default-policy-profile
Device(config-wireless-policy)# [no] ip mac-binding
```

ip multicast vlan

To configure IP multicast on a single VLAN, use the **ip multicast vlan** command in global configuration mode. To remove the VLAN from the WLAN, use the **no** form of the command.

ip multicast vlan {*vlan-name vlan-id*}
no ip multicast vlan {*vlan-name vlan-id*}

Syntax Description	*vlan-name*	Specifies the VLAN name.
	vlan-id	Specifies the VLAN ID.

Command Default Disabled.

Command Modes WLAN configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines None

This example configures vlan_id01 as a multicast VLAN.

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless multicast
Device(config)# wlan test-wlan 1
Device(config-wlan)# ip multicast vlan vlan_id01
```

ip nbar protocol-discovery

To configure application recognition on the wireless policy on enabling the NBAR2 engine, use the **ip nbar protocol-discovery** command.

ip nbar protocol-discovery

Command Default	None
Command Modes	config-wireless-policy

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure application recognition on the wireless policy:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy profile-policy-name
Device(config-wireless-policy)# ip nbar protocol-discovery
```

ip nbar protocol-pack

To load the protocol pack from bootflash, use the **ip nbar protocol-pack** command.

ip nbar protocol-pack bootflash:[**force**]

Syntax Description	**bootflash:** Load the protocol pack from bootflash:
	force Force load the Load protocol pack from the selected source.

Command Default None

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to load the NBAR2 protocol pack from bootflash:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ip nbar protocol-pack bootflash:
```

ip overlap

To enable overlapping client IP address in flex deployment, use the **ip overlap** command.

> **Note** By default, the configuration is disabled.

ip overlap

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes Global Configuration

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.4.1	This command was introduced.

Usage Guidelines

This example shows how to enable overlapping client IP address in flex deployment:

```
Device# configure terminal
Device(config)# wireless profile flex flex1
Device(config-wireless-flex-profile)# [no] ip overlap
```

ip ssh

To configure Secure Shell (SSH) control parameters on your router, use the **ip ssh** command in global configuration mode. To restore the default value, use the **no** form of this command.

ip ssh [**timeout** *seconds* | **authentication-retries** *integer*]
no ip ssh [**timeout** *seconds* | **authentication-retries** *integer*]

Syntax Description		
	timeout	(Optional) The time interval that the router waits for the SSH client to respond.
		This setting applies to the SSH negotiation phase. Once the EXEC session starts, the standard timeouts configured for the vty apply. By default, there are 5 vtys defined (0-4), therefore 5 terminal sessions are possible. After the SSH executes a shell, the vty timeout starts. The vty timeout defaults to 10 minutes.
	seconds	(Optional) The number of seconds until timeout disconnects, with a maximum of 120 seconds. The default is 120 seconds.
	authentication- retries	(Optional) The number of attempts after which the interface is reset.
	integer	(Optional) The number of retries, with a maximum of 5 authentication retries. The default is 3.

Command Default SSH control parameters are set to default router values.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.0(5)S	This command was introduced.
12.1(1)T	This command was integrated into Cisco IOS Release 12.1(1) T.
12.2(17a)SX	This command was integrated into Cisco IOS Release 12.2(17a)SX.
12.2(33)SRA	This command was integrated into Cisco IOS release 12.(33)SRA.
Cisco IOS XE Release 2.4	This command was implemented on the Cisco ASR 1000 series routers.

Usage Guidelines Before you configure SSH on your router, you must enable the SSH server using the **crypto key generate rsa**command.

Examples The following examples configure SSH control parameters on your router:

```
ip ssh timeout 120
ip ssh authentication-retries 3
```

ip ssh version

To specify the version of Secure Shell (SSH) to be run on a router, use the **ip ssh version**command in global configuration mode. To disable the version of SSH that was configured and to return to compatibility mode, use the **no** form of this command.

ip ssh version [**1** | **2**]
no ip ssh version [**1** | **2**]

Syntax Description

1	(Optional) Router runs only SSH Version 1.
2	(Optional) Router runs only SSH Version 2.

Command Default

If this command is not configured, SSH operates in compatibility mode, that is, Version 1 and Version 2 are both supported.

Command Modes

Global configuration

Command History

Release	Modification
12.3(4)T	This command was introduced.
12.3(2)XE	This command was integrated into Cisco IOS Release 12.3(2)XE.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.3(7)JA	This command was integrated into Cisco IOS Release 12.3(7)JA.
12.0(32)SY	This command was integrated into Cisco IOS Release 12.0(32)SY.
12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T.
15.2(2)SA2	This command was implemented on the Cisco ME 2600X Series Ethernet Access Switches.

Usage Guidelines

You can use this command with the **2** keyword to ensure that your router will not inadvertently establish a weaker SSH Version 1 connection.

Examples

The following example shows that only SSH Version 1 support is configured:

```
Router (config)# ip ssh version 1
```

The following example shows that only SSH Version 2 is configured:

```
Router (config)# ip ssh version 2
```

The following example shows that SSH Versions 1 and 2 are configured:

```
Router (config)# no ip ssh version
```

Related Commands

Command	Description
debug ip ssh	Displays debug messages for SSH.
disconnect ssh	Terminates a SSH connection on your router.
ip ssh	Configures SSH control parameters on your router.
ip ssh rsa keypair-name	Specifies which RSA key pair to use for a SSH connection.
show ip ssh	Displays the SSH connections of your router.

ip tftp blocksize

To specify TFTP client blocksize, use the **ip tftp blocksize** command.

ip tftp blocksize *blocksize-value*

Syntax Description	*blocksize-value*	Blocksize value. Valid range is from 512-8192 Kbps.

Command Default TFTP client blocksize is not configured.

Command Modes Global configuration (config)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines Use this command to change the default blocksize to decrease the image download time.

Example

The following example shows how to specify TFTP client blocksize:

```
Device(config)# ip tftp blocksize 512
```

ip verify source

To enable IP source guard on an interface, use the **ip verify source** command in interface configuration mode. To disable IP source guard, use the **no** form of this command.

ip verify source
no ip verify source

Command Default	IP source guard is disabled.
Command Modes	Interface configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

To enable IP source guard with source IP address filtering, use the **ip verify source** interface configuration command.

Examples

This example shows how to enable IP source guard with source IP address filtering on an interface:

```
Device(config)# interface gigabitethernet1/0/1
Device(config-if)# ip verify source
```

You can verify your settings by entering the **show ip verify source** privileged EXEC command.

ipv4-address-type

To configure the 802.11u IPv4 address type, use the **ipv4-address-type** command. To remove the address type, use the **no** form of the command.

ipv4-address-type
{**double-nated-private** | **not-available** | **not-known** | **port-restricted** | **port-restricted-double-nated** | **port-restricted-single-nated** | **public** | **single-nated-private**}

Syntax Description		
	double-nated-private	Sets IPv4 address as double network address translation (NAT) private.
	not-available	Sets IPv4 address type as not available.
	not-known	Sets IPv4 address type availability as not known.
	port-restricted	Sets IPv4 address type as port-restricted.
	port-restricted-double-nated	Sets IPv4 address type as port-restricted and double NATed.
	port-restricted-single-nated	Sets IPv4 address type as port-restricted and single NATed.
	public	Sets IPv4 address type as public.
	single-nated-private	Sets IPv4 address as single NATed private.

Command Default   None

Command Modes   Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure a a 802.11u IPv4 address type:

```
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# ipv4-address-type public
```

ipv4 arp-proxy

To enable proxy-ARP, use the **ipv4 arp-proxy** command. To disable proxy-ARP, use the **no** form of this command.

ipv4 arp-proxy

no ipv4 arp-proxy

Syntax Description	This command has no arguments or keywords.
Command Default	ARP proxy is not enabled.
Command Modes	wireless policy configuration (config-wireless-policy)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Usage Guidelines Proxy-ARP is applicable to only in central switching mode.

Example

The following example shows how to enable proxy-ARP:

```
Device(config-wireless-policy)#ipv4 arp-proxy
```

ipv4 dhcp

To configure the DHCP parameters for a WLAN, use the **ipv4 dhcp** command.

ipv4 dhcp {**opt82** | {**ascii** | **rid** | **format** | {**ap_ethmac** | **ap_location** | **apmac** | **apname** | **policy_tag** | **ssid** | **vlan_id** }} | **required** | **server** *dhcp-ip-addr*}

Syntax Description		
opt82	Sets DHCP option 82 for wireless clients on this WLAN
required	Specifies whether DHCP address assignment is required
server	Configures the WLAN's IPv4 DHCP Server
ascii	Supports ASCII for DHCP option 82
rid	Supports adding Cisco 2 byte RID for DHCP option 82
format	Sets RemoteID format
ap_ethmac	Enables DHCP AP Ethernet MAC address
ap_location	Enables AP location
apmac	Enables AP MAC address
apname	Enables AP name
site_tag (Policy tag)	Enables Site tag
ssid	Enables SSID
vlan_id	Enables VLAN ID
dhcp-ip-addr	Enter the override DHCP server's IP Address.

Command Default None

Command Modes config-wireless-policy

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure DHCP address assignment as a requirement:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy demo-profile-name
Device(config-wireless-policy)# ipv4 dhcp required
```

ipv4 flow monitor

To configure the IPv4 traffic ingress flow monitor for a WLAN profile policy, use the **ipv4 flow monitor input** command.

ipv4 flow monitor *monitor-name* **input**

Syntax Description	*monitor-name*	Flow monitor name.
	input	Enables flow monitor on ingress traffic.

Command Default   None

Command Modes   config-wireless-policy

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the IPv4 traffic ingress flow monitor for a WLAN profile policy:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy policy-profile-name
Device(config-wireless-policy)# ipv4 flow monitor flow-monitor-name input
```

ipv6 access-list

To define an IPv6 access list and to place the device in IPv6 access list configuration mode, use the **ipv6 access-list** command in global configuration mode. To remove the access list, use the **no** form of this command.

ipv6 access-list *access-list-name* | **match-local-traffic** | **log-update threshold** *threshold-in-msgs* | **role-based** *list-name*
noipv6 access-list *access-list-name* | **client** *permit-control-packets*| **log-update** *threshold* | **role-based** *list-name*

Syntax Description		
ipv6 *access-list-name*	Creates a named IPv6 ACL (up to 64 characters in length) and enters IPv6 ACL configuration mode. *access-list-name* - Name of the IPv6 access list. Names cannot contain a space or quotation mark, or begin with a numeric.	
match-local-traffic	Enables matching for locally-generated traffic.	
log-update threshold *threshold-in-msgs*	Determines how syslog messages are generated after the initial packet match. *threshold-in-msgs*- Number of packets generated.	
role-based *list-name*	Creates a role-based IPv6 ACL.	

Command Default   No IPv6 access list is defined.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   IPv6 ACLs are defined by using the **ipv6 access-list**command in global configuration mode and their permit and deny conditions are set by using the **deny** and **permit**commands in IPv6 access list configuration mode. Configuring the **ipv6 access-list**command places the device in IPv6 access list configuration mode--the device prompt changes to Device(config-ipv6-acl)#. From IPv6 access list configuration mode, permit and deny conditions can be set for the defined IPv6 ACL.

✎

Note   IPv6 ACLs are defined by a unique name (IPv6 does not support numbered ACLs). An IPv4 ACL and an IPv6 ACL cannot share the same name.

IPv6 is automatically configured as the protocol type in **permit any any** and **deny any any** statements that are translated from global configuration mode to IPv6 access list configuration mode.

Every IPv6 ACL has implicit **permit icmp any any nd-na**, **permit icmp any any nd-ns**, and **deny ipv6 any any** statements as its last match conditions. (The former two match conditions allow for ICMPv6 neighbor

discovery.) An IPv6 ACL must contain at least one entry for the implicit **deny ipv6 any any** statement to take effect. The IPv6 neighbor discovery process makes use of the IPv6 network layer service; therefore, by default, IPv6 ACLs implicitly allow IPv6 neighbor discovery packets to be sent and received on an interface. In IPv4, the Address Resolution Protocol (ARP), which is equivalent to the IPv6 neighbor discovery process, makes use of a separate data link layer protocol; therefore, by default, IPv4 ACLs implicitly allow ARP packets to be sent and received on an interface.

Use the **ipv6 traffic-filter** interface configuration command with the *access-list-name* argument to apply an IPv6 ACL to an IPv6 interface. Use the **ipv6 access-class** line configuration command with the *access-list-name* argument to apply an IPv6 ACL to incoming and outgoing IPv6 virtual terminal connections to and from the device.

An IPv6 ACL applied to an interface with the **ipv6 traffic-filter** command filters traffic that is forwarded, not originated, by the device.

Examples

The example configures the IPv6 ACL list named list1 and places the device in IPv6 access list configuration mode.

```
Device(config)# ipv6 access-list list1
Device(config-ipv6-acl)#
```

The following example configures the IPv6 ACL named list2 and applies the ACL to outbound traffic on Ethernet interface 0. Specifically, the first ACL entry keeps all packets from the network FEC0:0:0:2::/64 (packets that have the site-local prefix FEC0:0:0:2 as the first 64 bits of their source IPv6 address) from exiting out of Ethernet interface 0. The second entry in the ACL permits all other traffic to exit out of Ethernet interface 0. The second entry is necessary because an implicit deny all condition is at the end of each IPv6 ACL.

```
Device(config)# ipv6 access-list list2 deny FEC0:0:0:2::/64 any
Device(config)# ipv6 access-list list2 permit any any
Device(config)# interface ethernet 0
Device(config-if)# ipv6 traffic-filter list2 out
```

ipv6-address-type

To configure the 802.11u IPv6 address type, use the **ipv6-address-type** command. To remove the address type, use the **no** form of the command.

ipv6-address-type { **available** | **not-available** | **not-known** }

Syntax Description	**available**	Sets IPv6 address type as available.
	not-available	Sets IPv6 address type as not available.
	not-known	Sets IPv6 address type availability as not known.

Command Default   None

Command Modes   Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure a 802.11u IPv6 address type:

```
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# ipv4-address-type available
```

ipv6 address

To configure an IPv6 address based on an IPv6 general prefix and enable IPv6 processing on an interface, use the **ipv6 address**command in interface configuration mode. To remove the address from the interface, use the **no** form of this command.

ipv6 address {*ipv6-prefix/prefix-length* | *prefix-name sub-bits/prefix-length*}
no ipv6 address {*ipv6-address/prefix-length* | *prefix-name sub-bits/prefix-length*}

Syntax Description

ipv6-address	The IPv6 address to be used.
/ prefix-length	The length of the IPv6 prefix. A decimal value that indicates how many of the high-order contiguous bits of the address comprise the prefix (the network portion of the address). A slash mark must precede the decimal value.
prefix-name	A general prefix, which specifies the leading bits of the network to be configured on the interface.
sub-bits	The subprefix bits and host bits of the address to be concatenated with the prefixes provided by the general prefix specified with the *prefix-name* argument. The *sub-bits*argument must be in the form documented in RFC 2373 where the address is specified in hexadecimal using 16-bit values between colons.

Command Default   No IPv6 addresses are defined for any interface.

Command Modes

Interface configuration

Command History

Release	Modification
12.2(2)T	This command was introduced.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(25)SG	This command was integrated into Cisco IOS Release 12.2(25)SG.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was integrated into Cisco ASR 1000 Series devices.
15.2(4)S	This command was integrated into Cisco IOS Release 15.2(4)S.
15.2(2)SNG	This command was implemented on the Cisco ASR 901 Series Aggregation Services devices.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines   The **ipv6 address** command allows multiple IPv6 addresses to be configured on an interface in various different ways, with varying options. The most common way is to specify the IPv6 address with the prefix length.

Addresses may also be defined using the general prefix mechanism, which separates the aggregated IPv6 prefix bits from the subprefix and host bits. In this case, the leading bits of the address are defined in a general prefix, which is globally configured or learned (for example, through use of Dynamic Host Configuration Protocol-Prefix Delegation (DHCP-PD)), and then applied using the *prefix-name* argument. The subprefix bits and host bits are defined using the *sub-bits* argument.

Using the **no ipv6 address autoconfig** command without arguments removes all IPv6 addresses from an interface.

IPv6 link-local addresses must be configured and IPv6 processing must be enabled on an interface by using the **ipv6 address link-local** command.

Examples   The following example shows how to enable IPv6 processing on the interface and configure an address based on the general prefix called my-prefix and the directly specified bits:

```
Device(config-if) ipv6 address my-prefix 0:0:0:7272::72/64
```

Assuming the general prefix named my-prefix has the value of 2001:DB8:2222::/48, then the interface would be configured with the global address 2001:DB8:2222:7272::72/64.

Related Commands

Command	Description
ipv6 address anycast	Configures an IPv6 anycast address and enables IPv6 processing on an interface.
ipv6 address eui-64	Configures an IPv6 address and enables IPv6 processing on an interface using an EUI-64 interface ID in the low-order 64 bits of the address.
ipv6 address link-local	Configures an IPv6 link-local address for an interface and enables IPv6 processing on the interface.
ipv6 unnumbered	Enables IPv6 processing on an interface without assigning an explicit IPv6 address to the interface.
no ipv6 address autoconfig	Removes all IPv6 addresses from an interface.
show ipv6 interface	Displays the usability status of interfaces configured for IPv6.

ipv6 dhcp pool

To configure a Dynamic Host Configuration Protocol (DHCP) for IPv6 server configuration information pool and enter DHCP for IPv6 pool configuration mode, use the **ipv6 dhcp pool** command in global configuration mode. To delete a DHCP for IPv6 pool, use the **no** form of this command.

ipv6 dhcp pool *poolname*
no ipv6 dhcp pool *poolname*

Syntax Description	*poolname*	User-defined name for the local prefix pool. The pool name can be a symbolic string (such as "Engineering") or an integer (such as 0).

Command Default   DHCP for IPv6 pools are not configured.

Command Modes

Global configuration

Command History

Release	Modification
12.3(4)T	This command was introduced.
12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE.
12.4(24)T	This command was integrated into Cisco IOS Release 12.4(24)T.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
12.2(33)SRE	This command was modified. It was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was modified. It was integrated into Cisco IOS Release 12.2(33)XNE.

Usage Guidelines   Use the **ipv6 dhcp pool**command to create a DHCP for IPv6 server configuration information pool. When the **ipv6 dhcp pool** command is enabled, the configuration mode changes to DHCP for IPv6 pool configuration mode. In this mode, the administrator can configure pool parameters, such as prefixes to be delegated and Domain Name System (DNS) servers, using the following commands:

- **address prefix** *IPv6-prefix* [**lifetime** {*valid-lifetime preferred-lifetime* | **infinite**}]sets an address prefix for address assignment. This address must be in hexadecimal, using 16-bit values between colons.

- **link-address** *IPv6-prefix* sets a link-address IPv6 prefix. When an address on the incoming interface or a link-address in the packet matches the specified IPv6-prefix, the server uses the configuration information pool. This address must be in hexadecimal, using 16-bit values between colons.

- **vendor-specific** *vendor-id* enables DHCPv6 vendor-specific configuration mode. Specify a vendor identification number. This number is the vendor IANA Private Enterprise Number. The range is 1 to 4294967295. The following configuration command is available:

  - **suboption** *number* sets vendor-specific suboption number. The range is 1 to 65535. You can enter an IPv6 address, ASCII text, or a hex string as defined by the suboption parameters.

> **Note** The **hex** value used under the **suboption** keyword allows users to enter only hex digits (0-f). Entering an invalid **hex** value does not delete the previous configuration.

Once the DHCP for IPv6 configuration information pool has been created, use the **ipv6 dhcp server** command to associate the pool with a server on an interface. If you do not configure an information pool, you need to use the **ipv6 dhcp server interface** configuration command to enable the DHCPv6 server function on an interface.

When you associate a DHCPv6 pool with an interface, only that pool services requests on the associated interface. The pool also services other interfaces. If you do not associate a DHCPv6 pool with an interface, it can service requests on any interface.

Not using any IPv6 address prefix means that the pool returns only configured options.

The **link-address** command allows matching a link-address without necessarily allocating an address. You can match the pool from multiple relays by using multiple link-address configuration commands inside a pool.

Since a longest match is performed on either the address pool information or the link information, you can configure one pool to allocate addresses and another pool on a subprefix that returns only configured options.

Examples

The following example specifies a DHCP for IPv6 configuration information pool named cisco1 and places the router in DHCP for IPv6 pool configuration mode:

```
Router(config)# ipv6 dhcp pool cisco1
Router(config-dhcpv6)#
```

The following example shows how to configure an IPv6 address prefix for the IPv6 configuration pool cisco1:

```
Router(config-dhcpv6)# address prefix 2001:1000::0/64
Router(config-dhcpv6)# end
```

The following example shows how to configure a pool named engineering with three link-address prefixes and an IPv6 address prefix:

```
Router# configure terminal
Router(config)# ipv6 dhcp pool engineering
Router(config-dhcpv6)# link-address 2001:1001::0/64
Router(config-dhcpv6)# link-address 2001:1002::0/64
Router(config-dhcpv6)# link-address 2001:2000::0/48
Router(config-dhcpv6)# address prefix 2001:1003::0/64
Router(config-dhcpv6)# end
```

The following example shows how to configure a pool named 350 with vendor-specific options:

```
Router# configure terminal
Router(config)# ipv6 dhcp pool 350
Router(config-dhcpv6)# vendor-specific 9
Router(config-dhcpv6-vs)# suboption 1 address 1000:235D::1
Router(config-dhcpv6-vs)# suboption 2 ascii "IP-Phone"
Router(config-dhcpv6-vs)# end
```

Related Commands

Command	Description
ipv6 dhcp server	Enables DHCP for IPv6 service on an interface.
show ipv6 dhcp pool	Displays DHCP for IPv6 configuration pool information.

ipv6 enable

To enable IPv6 processing on an interface that has not been configured with an explicit IPv6 address, use the **ipv6 enable**command in interface configuration mode. To disable IPv6 processing on an interface that has not been configured with an explicit IPv6 address, use the **no** form of this command.

ipv6 enable
no ipv6 enable

Syntax Description

This command has no arguments or keywords.

Command Default

IPv6 is disabled.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(2)T	This command was introduced.
12.0(21)ST	This command was integrated into Cisco IOS Release 12.0(21)ST.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(25)SG	This command was integrated into Cisco IOS Release 12.2(25)SG.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
15.2(2)SNG	This command was implemented on the Cisco ASR 901 Series Aggregation Services devices.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.
15.2(2)SA2	This command was implemented on the Cisco ME 2600X Series Ethernet Access Switches.

Usage Guidelines

The **ipv6 enable**command automatically configures an IPv6 link-local unicast address on the interface while also enabling the interface for IPv6 processing. The no **ipv6 enable**command does not disable IPv6 processing on an interface that is configured with an explicit IPv6 address.

Examples

The following example enables IPv6 processing on Ethernet interface 0/0:

```
Device(config)# interface ethernet 0/0
Device(config-if)# ipv6 enable
```

	Command	Description
Related Commands	**ipv6 address link-local**	Configures an IPv6 link-local address for an interface and enables IPv6 processing on the interface.
	ipv6 address eui-64	Configures an IPv6 address and enables IPv6 processing on an interface using an EUI-64 interface ID in the low-order 64 bits of the address.
	ipv6 unnumbered	Enables IPv6 processing on an interface without assigning an explicit IPv6 address to the interface.
	show ipv6 interface	Displays the usability status of interfaces configured for IPv6.

ipv6 flow-export destination

To configure IPv6 ETA flow export destination, use the **ipv6 flow-export destination** command.

ipv6 flow-export destination *ipv6_address port_number* [**source-interface** *interface-name*] [**ipfix**]

Syntax Description		
	ip_address	Flow destination address.
	port_number	Flow destination port number. The range is from 1 to 65535.
	source-interface	(Optional) The source interface name of the exported ETA record.
	interface-number	(Optional) The source address of the exported ETA record. The IP address of the interface is used as source IP address of the exported ETA record packet.
	ipfix	(Optional) The format of the exported ETA records.

Command Default   None

Command Modes   ET-Analytics configuration

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced.

This example shows how to configure ETA flow export destination:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# et-analytics
Device(config-et-analytics)# ipv6 flow-export destination 2001:181:181::1 22 source-interface
 loopback0 ipfix
Device(config-et-analytics)# end
```

ipv6 nd proxy

To enable IPv6 Neighbor Discovery (ND) or Duplicate Address Detection (DAD), use the **ipv6 nd proxy** command. To disable ND or DAD proxy, use the **no** form of this command.

ipv6 nd proxy {**dad-proxy** | **full-proxy**}

no ipv6 nd proxy {**dad-proxy** | **full-proxy**}

Syntax Description	**dad-proxy**	Enables the DAD proxy.
	full-proxy	Enables the full proxy. This enables DAD proxy and non-DAD Neighbor Solicitation proxy.

Command Default	Neighbor Discovery Proxy is not enabled.

Command Modes	wireless policy configuration (config-wireless-policy)

Command History	**Release**	**Modification**
	Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Usage Guidelines   DAD proxy is applicable only in central switching mode.

Example

The following example shows how to enable DAD proxy:

```
Device(config-wireless-policy)#ipv6 nd proxy dad-proxy
```

ipv6 mld snooping

To enable Multicast Listener Discovery version 2 (MLDv2) protocol snooping globally, use the **ipv6 mld snooping** command in global configuration mode. To disable the MLDv2 snooping globally, use the **no** form of this command.

ipv6 mld snooping
no ipv6 mld snooping

Syntax Description	This command has no arguments or keywords.

Command Default	This command is enabled.

Command Modes	Global configuration

Command History

Release	Modification
12.2(18)SXE	This command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
15.4(2)S	This command was implemented on the Cisco ASR 901 Series Aggregation Services Router.

Usage Guidelines

MLDv2 snooping is supported on the Supervisor Engine 720 with all versions of the Policy Feature Card 3 (PFC3).

To use MLDv2 snooping, configure a Layer 3 interface in the subnet for IPv6 multicast routing or enable the MLDv2 snooping querier in the subnet.

Examples

This example shows how to enable MLDv2 snooping globally:

```
Router(config)# ipv6 mld snooping
```

Related Commands

Command	Description
show ipv6 mld snooping	Displays MLDv2 snooping information.

ipv6 nd managed-config-flag

To set the managed address configuration flag in IPv6 router advertisements, use the **ipv6 nd managed-config-flag** command in an appropriate configuration mode. To clear the flag from IPv6 router advertisements, use the **no** form of this command.

ipv6 nd managed-config-flag
no ipv6 nd managed-config-flag

Syntax Description	This command has no keywords or arguments.
Command Default	The managed address configuration flag is not set in IPv6 router advertisements.
Command Modes	Interface configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines

Setting the managed address configuration flag in IPv6 router advertisements indicates to attached hosts whether they should use stateful autoconfiguration to obtain addresses. If the flag is set, the attached hosts should use stateful autoconfiguration to obtain addresses. If the flag is not set, the attached hosts should not use stateful autoconfiguration to obtain addresses.

Hosts may use stateful and stateless address autoconfiguration simultaneously.

Examples

This example shows how to configure the managed address configuration flag in IPv6 router advertisements:

```
Device(config)# interface
Device(config-if)# ipv6 nd managed-config-flag
```

ipv6 nd other-config-flag

To set the other stateful configuration flag in IPv6 router advertisements, use the **ipv6 nd other-config-flag** command in an appropriate configuration mode. To clear the flag from IPv6 router advertisements, use the **no** form of this command.

ipv6 nd other-config-flag

Syntax Description	This command has no keywords or arguments.
Command Default	The other stateful configuration flag is not set in IPv6 router advertisements.
Command Modes	Interface configuration
	Dynamic template configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines   The setting of the other stateful configuration flag in IPv6 router advertisements indicates to attached hosts how they can obtain autoconfiguration information other than addresses. If the flag is set, the attached hosts should use stateful autoconfiguration to obtain the other (nonaddress) information.

> **Note**   If the managed address configuration flag is set using the **ipv6 nd managed-config-flag** command, then an attached host can use stateful autoconfiguration to obtain the other (nonaddress) information regardless of the setting of the other stateful configuration flag.

Examples   This example (not applicable for BNG) configures the "other stateful configuration" flag in IPv6 router advertisements:

```
Device(config)# interface
Device(config-if)# ipv6 nd other-config-flag
```

ipv6 nd ra throttler attach-policy

To configure a IPv6 policy for feature RA throttler, use the **ipv6 nd ra-throttler attach-policy** command.

ipv6 nd ra-throttler attach-policy *policy-name*

Syntax Description		
	ipv6	IPv6 root chain.
	ra-throttler	Configure RA throttler on the VLAN.
	attach-policy	Apply a policy for feature RA throttler.
	policy-name	Policy name for feature RA throttler

Command Default	None

Command Modes	config-vlan

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure configure a IPv6 policy for feature RA throttler:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# vlan configuration vlan-id
Device(config-vlan-config)# ipv6 nd ra-throttler attach-policy
```

ipv6 nd raguard policy

To define the router advertisement (RA) guard policy name and enter RA guard policy configuration mode, use the **ipv6 nd raguard policy** command in global configuration mode.

ipv6 nd raguardpolicy *policy-name*

Syntax Description

policy-name	IPv6 RA guard policy name.

Command Default   An RA guard policy is not configured.

Command Modes

Global configuration (config)#

Command History

Release	Modification
12.2(50)SY	This command was introduced.
15.2(4)S	This command was integrated into Cisco IOS Release 15.2(4)S.
15.0(2)SE	This command was integrated into Cisco IOS Release 15.0(2)SE.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines   Use the **ipv6 nd raguard policy** command to configure RA guard globally on a router. Once the device is in ND inspection policy configuration mode, you can use any of the following commands:

- **device-role**

- **drop-unsecure**

- **limit address-count**

- **sec-level minimum**

- **trusted-port**

- **validate source-mac**

After IPv6 RA guard is configured globally, you can use the **ipv6 nd raguard attach-policy** command to enable IPv6 RA guard on a specific interface.

Examples   The following example shows how to define the RA guard policy name as policy1 and place the device in policy configuration mode:

```
Device(config)# ipv6 nd raguard policy policy1
Device(config-ra-guard)#
```

Related Commands   *Table 9:*

Command	Description
device-role	Specifies the role of the device attached to the port.
drop-unsecure	Drops messages with no or invalid options or an invalid signature.
ipv6 nd raguard attach-policy	Applies the IPv6 RA guard feature on a specified interface.
limit address-count	Limits the number of IPv6 addresses allowed to be used on the port.
sec-level minimum	Specifies the minimum security level parameter value when CGA options are used.
trusted-port	Configures a port to become a trusted port.
validate source-mac	Checks the source MAC address against the link layer address.

ipv6 traffic-filter

This command enables IPv6 traffic filter.

To enable the filtering of IPv6 traffic on an interface, use the **ipv6 traffic-filter** command. To disable the filtering of IPv6 traffic on an interface, use the **no** form of the command.

Use the **ipv6 traffic-filter** interface configuration command on the switch stack or on a standalone switch to filter IPv6 traffic on an interface. The type and direction of traffic that you can filter depends on the feature set running on the switch stack. Use the **no** form of this command to disable the filtering of IPv6 traffic on an interface.

ipv6 traffic-filter [**web**] *acl-name*
no ipv6 traffic-filter [**web**]

Syntax Description		
web	(Optional) Specifies an IPv6 access name for the WLAN Web ACL.	
acl-name	Specifies an IPv6 access name.	

Command Default   Filtering of IPv6 traffic on an interface is not configured.

Command Modes   wlan

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   To configure the dual IPv4 and IPv6 template, enter the **sdm prefer dual-ipv4-and-ipv6 {default | vlan}** global configuration command and reload the switch.

You can use the **ipv6 traffic-filter** command on physical interfaces (Layer 2 or Layer 3 ports), Layer 3 port channels, or switch virtual interfaces (SVIs).

You can apply an ACL to outbound or inbound traffic on Layer 3 interfaces (port ACLs), or to inbound traffic on Layer 2 interfaces (router ACLs).

If **any** port ACL (IPv4, IPv6, or MAC) is applied to an interface, that port ACL is used to filter packets, and any router ACLs attached to the SVI of the port VLAN are ignored.

This example shows how to filter IPv6 traffic on an interface:

```
Device(config-wlan)# ipv6 traffic-filter TestDocTrafficFilter
```

key

To identify an authentication key on a key chain, use the **key** command in key-chain configuration mode. To remove the key from the key chain, use the **no** form of this command.

key *key-id*
no key *key-id*

Syntax Description	*key-id*	Identification number of an authentication key on a key chain. The range of keys is from 0 to 2147483647. The key identification numbers need not be consecutive.

Command Default   No key exists on the key chain.

Command Modes   Command Modes Key-chain configuration (config-keychain)

Usage Guidelines   It is useful to have multiple keys on a key chain so that the software can sequence through the keys as they become invalid after time, based on the **accept-lifetime** and **send-lifetime** key chain key command settings.

Each key has its own key identifier, which is stored locally. The combination of the key identifier and the interface associated with the message uniquely identifies the authentication algorithm and Message Digest 5 (MD5) authentication key in use. Only one authentication packet is sent, regardless of the number of valid keys. The software starts looking at the lowest key identifier number and uses the first valid key.

If the last key expires, authentication will continue and an error message will be generated. To disable authentication, you must manually delete the last valid key.

To remove all keys, remove the key chain by using the **no key chain** command.

Examples   The following example shows how to specify a key to identify authentication on a key-chain:

```
Device(config-keychain)#key 1
```

Related Commands	**Command**	**Description**
	accept-lifetime	Sets the time period during which the authentication key on a key chain is received as valid.
	key chain	Defines an authentication key chain needed to enable authentication for routing protocols.
	key-string (authentication)	Specifies the authentication string for a key.
	show key chain	Displays authentication key information.

key config-key password-encrypt

To set a private configuration key for password encryption, use the **key config-key password-encrypt** command. To disable this feature, use the **no** form of this command.

key config-key password-encrypt *<config-key>*

Syntax Description	*config-key*	Enter a value with minimum 8 characters.
	Note	The value must not begin with the following special characters:
		!, #, and ;

Command Default   None

Command Modes   Global configuration mode

Command History

Release	Modification
Cisco IOS XE Gibraltar 17.6.1	This command was introduced.

Examples

The following example shows how to set a username and password for AP management:

```
Device# enable
Device# configure terminal
Device(config)# key config-key password-encryption 12345678
Device(config-ap-profile)# password encryption aes
Device(config-ap-profile)# end
```

ldap attribute-map

To configure a dynamic attribute map on an SLDAP server, use the **ldap attribute-map** command.

ldap attribute-map *map-name*

Command Default	None
Command Modes	Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure a dynamic attribute map on an SLDAP server:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ldap attribute-map map1
Device(config-attr-map)# map type department supplicant-group
Device(config-attr-map)# exit
```

ldap server

To configure secure LDAP, use the **ldap server** command.

ldap server *name*

Syntax Description

name	Server name.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

This example shows how to configure secure LDAP:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ldap server server1
Device(config-ldap-server)# ipv4 9.4.109.20
Device(config-ldap-server)# timeout retransmit 20
Device(config-ldap-server)# bind authenticate root-dn
CN=ldapipv6user,CN=Users,DC=ca,DC=ssh2,DC=com password Cisco12345
Device(config-ldap-server)# base-dn CN=Users,DC=ca,DC=ssh2,DC=com
Device(config-ldap-server)# mode secure no- negotiation
Device(config-ldap-server)# end
```

license air level

To configure AIR licenses on a wireless controller, enter the **license air level** command in global configuration mode. To revert to the default setting, use the **no** form of this command.

license air level { **air-network-advantage** [**addon air-dna-advantage**] | **air-network-essentials** [**addon air-dna-essentials**] }

no license air level

Syntax Description	**air-network-advantage**	Configures the AIR Network Advantage license level.
	addon air-dna-advantage	(Optional) Configures the add-on AIR DNA Advantage license level.
		This add-on option is available with the AIR Network Advantage license.
	air-network-essentials	Configures the AIR Network Essentials license level.
	addon air-dna-essentials	(Optional) Configures the add-on AIR DNA Essentials license level.
		This add-on option is available with the AIR Network Essential license.

Command Default   For all Cisco Catalyst 9800 Wireless controllers the default license is AIR DNA Advantage.

For EWC-APs:

- Prior to Cisco IOS XE Bengaluru 17.4.1, the default license is AIR DNA Essentials.

- Starting with Cisco IOS XE Bengaluru 17.4.1, the default license is AIR Network Essentials

Command Modes   Global configuration (config)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
	Cisco IOS XE Amsterdam 17.3.2a	This command continues to be available and applicable with the introduction of Smart Licensing Using Policy.
	Cisco IOS XE Bengaluru 17.4.1	Only for EWC-APs, the default license was changed from AIR DNA Essentials to AIR Network Essentials.

Usage Guidelines   In the Smart Licensing Using Policy environment, you can use the **license air level** command to change the license level being used on the product instance, or to additionally configure an add-on license on the product instance. The change is effective after a reload.

The licenses that can be configured are:

- AIR Network Essential

- AIR Network Advantage

- AIR DNA Essential

• AIR DNA Advantage

You can configure AIR DNA Essential or AIR DNA Advantage license level and on term expiry, you can move to the Network Advantage or Network Essentials license level, if you do not want to renew the DNA license.

Every connecting AP requires a Cisco DNA Center License to leverage the unique value properties of the controller.

Examples

The following example show how to configure the AIR DNA Essential license level:

```
Device# configure terminal
Device(config)# license air level network-essentials addon air-dna-essentials
```

The following example shows how the AIR DNA Advantage license level is configured to begin with and then changed to AIR DNA Essentials:

Current configuration as AIR DNA Advantage:

```
Device# show version
Cisco IOS XE Software, Version 17.03.02
Cisco IOS Software [Amsterdam], C9800-CL Software (C9800-CL-K9_IOSXE), Version 17.3.2,
RELEASE SOFTWARE
<output truncated>
AIR License Level: AIR DNA Advantage
Next reload AIR license Level: AIR DNA Advantage

Smart Licensing Status: Registration Not Applicable/Not Applicable
<output truncated>
```

Configuration of AIR DNA Essentials :

```
Device# configure terminal
Device(config)# license air level air-network-essentials addon air-dna-essentials

Device# exit
Device# show version
Cisco IOS XE Software, Version 17.03.02
Cisco IOS Software [Amsterdam], C9800-CL Software (C9800-CL-K9_IOSXE), Version 17.3.2,
RELEASE SOFTWARE
<output truncated>
AIR License Level: AIR DNA Advantage
Next reload AIR license Level: AIR DNA Essentials
Smart Licensing Status: Registration Not Applicable/Not Applicable
<output truncated>

Device# write memory
Device# reload
```

After reload:

```
Device# show version
Cisco IOS XE Software, Version 17.03.02
Cisco IOS Software [Amsterdam], C9800-CL Software (C9800-CL-K9_IOSXE), Version 17.3.2,
RELEASE SOFTWARE
<output truncated>
AIR License Level: AIR DNA Essentials
Next reload AIR license Level: AIR DNA Essentials

Smart Licensing Status: Registration Not Applicable/Not Applicable
<output truncated>
```

license smart (global config)

To configure licensing-related settings such as the mode of transport and the URL that the product instance uses to communicate with Cisco Smart Software Manager (CSSM), or Cisco Smart Licensing Utility (CSLU), or Smart Software Manager On-Prem (SSM On-Prem), to configure the usage reporting interval, to configure the information that must be exluded or included in a license usage report (RUM report), enter the **license smart** command in global configuration mode. Use the **no** form of the command to revert to default values.

license smart { **custom_id** *ID* | **enable** | **privacy** { **all** | **hostname** | **version** } | **proxy** { **address** *address_hostname* | **port** *port* } | **reservation** | **server-identity-check** | **transport** { **automatic** | **callhome** | **cslu** | **off** | **smart** } | **url** { *url* | **cslu** *cslu_or_on-prem_url* | **default** | **smart** *smart_url* | **utility** *secondary_url* } | **usage** { **customer-tags** { **tag1** | **tag2** | **tag3** | **tag4** } *tag_value* | **interval** *interval_in_days* } | **utility** [**customer_info** { **city** *city* | **country** *country* | **postalcode** *postalcode* | **state** *state* | **street** *street* }] }

no license smart { **custom_id** | **enable** | **privacy** { **all** | **hostname** | **version** } | **proxy** { **address** *address_hostname* | **port** *port* } | **reservation** | **server-identity-check** | **transport** | **url** { *url* | **cslu** *cslu_or_on-prem_url* | **default** | **smart** *smart_url* | **utility** *secondary_url* } | **usage** { **customer-tags** { **tag1** | **tag2** | **tag3** | **tag4** } *tag_value* | **interval** *interval_in_days* } | **utility** [**customer_info** { **city** *city* | **country** *country* | **postalcode** *postalcode* | **state** *state* | **street** *street* }] }

Syntax Description		
custom_id *ID*		Although available on the CLI, this option is not supported.
enable		Although visible on the CLI, configuring this keyword has no effect. Smart licensing is always enabled.

privacy { **all** | **hostname** | **version** }	Sets a privacy flag to prevent the sending of the specified data privacy related information.
	When the flag is disabled, the corresponding information is sent in a message or offline file created by the product instance.
	Depending on the topology this is sent to one or more components, including CSSM, CSLU, and SSM On-Prem.
	All data privacy settings are disabled by default. You must configure the option you want to exclude from all communication:
	• **all**: All data privacy related information is excluded from any communication.
	The **no** form of the command causes all data privacy related information to be sent in a message or offline file.
	Note The Product ID (PID) and serial number are *included in the RUM report* regardless of whether data privacy is enabled or not.
	• **hostname**: Excludes hostname information from any communication. When hostname privacy is enabled, the *UDI* of the product instance is displayed on the applicable user interfaces (CSSM, CSLU, and SSM On-Prem).
	The **no** form of the command causes hostname information to be sent in a message or offline file. The hostname is displayed on the applicable user interfaces (CSSM, CSLU, and SSM On-Prem).
	• **version**: Excludes the Cisco IOS-XE software version running on the product instance and the Smart Agent version from any communication.
	The **no** form of the command causes version information to be sent in a message or offline file.

proxy { **address** *address_hostname* | **port** *port* }	Configures a proxy for license usage synchronization with CSLU or CSSM. This means that you can use this option to configure a proxy only if the transport mode is **license smart transport smart** (CSSM), or **license smart transport cslu** (CSLU).
	
	However, you cannot configure a proxy for license usage synchronization in an SSM On-Prem deployment, which also uses **license smart transport cslu** as the transport mode.
	
	Configure the following options:
	
	• **address** *address_hostname*: Configures the proxy address.
	
	  For *address_hostname*, enter the enter the IP address or hostname of the proxy.
	
	• **port***port*: Configures the proxy port.
	
	  For *port*, enter the proxy port number.

reservation	Enables or disables a license reservation feature. **Note** Although available on the CLI, this option is not applicable because license *reservation* is not applicable in the Smart Licensing Using Policy environment.
server-identity-check	Enables or disables the HTTP secure server identity check.

transport { **automatic** | **callhome** | **cslu** | **off** | **smart** }	Configures the mode of transport the product instance uses to communicate with CSSM. Choose from the following options:
	
	• **automatic**: Sets the transport mode **cslu**.
	
	  Note The **automatic** keyword is not supported on Cisco Catalyst Wireless Controllers.
	
	• **callhome**: Enables Call Home as the transport mode.
	
	• **cslu**: Enables CSLU as the transport mode. This is the default transport mode.
	
	  The same keyword applies to both CSLU *and* SSM On-Prem, but the URLs are different. See **cslu***cslu_or_on-prem_url* in the following row.
	
	• **off**: Disables all communication from the product instance.
	
	• **smart**: Enables Smart transport.

url { *url* | **cslu** *cslu_url* | **default** | **smart**
smart_url | **utility** *secondary_url* }

Sets URL that is used for the configured transport mode. Choose from the following options:

- *url*: If you have configured the transport mode as **callhome**, configure this option. Enter the CSSM URL exactly as follows:

  `https://tools.cisco.com/its/service/oddce/services/DDCEService`

  The **no license smart url** *url* command reverts to the default URL.

- **cslu** *cslu_or_on-prem_url*: If you have configured the transport mode as **cslu**, configure this option, with the URL for CSLU or SSM On-Prem, as applicable:

  - If you are using CSLU, enter the URL as follows:

    `http://<cslu_ip_or_host>:8182/cslu/v1/pi`

    For `<cslu_ip_or_host>`, enter the hostname or the IP address of the windows host where you have installed CSLU. 8182 is the port number and it is the only port number that CSLU uses.

    The **no license smart url cslu** *cslu_or_on-prem_url* command reverts to `http://cslu-local:8182/cslu/v1/pi`

  - If you are using SSM On-Prem, enter the URL as follows:

    `http://<ip>/cslu/v1/pi/<tenant ID>`

    For <ip>, enter the hostname or the IP address of the server where you have installed SSM On-Prem. The <tenantID> must be the default local virtual account ID.

Tip	You can retrieve the entire URL from SSM On-Prem. In the software configuration guide (17.3.x and later), see Smart Licensing Using Policy > Task Library for Smart Licensing Using Policy > Retrieving the Transport URL (SSM On-Prem UI).

    The **no license smart url cslu** *cslu_or_on-prem_url* command reverts to `http://cslu-local:8182/cslu/v1/pi`

- **default**: Depends on the configured transport mode. Only the **smart** and **cslu** transport modes are supported with this option.

  If the transport mode is set to **cslu**, and you configure **license smart url default**, the CSLU URL is configured automatically

(`https://cslu-local:8182/cslu/v1/pi`).

If the transport mode is set to **smart**, and you configure **license smart url default**, the Smart URL is configured automatically (`https://smartreceiver.cisco.com/licservice/license`).

- **smart** *smart_url*: If you have configured the transport type as **smart**, configure this option. Enter the URL exactly as follows:

  `https://smartreceiver.cisco.com/licservice/license`

  When you configure this option, the system automatically creates a duplicate of the URL in **license smart url** *url*. You can ignore the duplicate entry, no further action is required.

  The **no license smart url smart***smart_url* command reverts to the default URL.

- **utility** *smart_url*: Although available on the CLI, this option is not supported.

usage { **customer-tags** { **tag1** | **tag2** | **tag3** | **tag4** } *tag_value* | **interval** *interval_in_days* }	Configures usage reporting settings. You can set the following options:
	• **customer-tags**{ **tag1** | **tag2** | **tag3** | **tag4** } *tag_value*: Defines strings for inclusion in data models, for telemetry. Up to 4 strings (or tags) may be defined.
	For *tag_value*, enter the string value for each tag that you define.
	• **interval** *interval_in_days*: Sets the reporting interval in days. By default the RUM report is sent every 30 days. The valid value range is 1 to 3650.
	If you set the value to zero, RUM reports are not sent, regardless of what the applied policy specifies - this applies to topologies where CSLU or CSSM may be on the receiving end.
	If you set a value that is greater than zero and the transport type is set to **off**, then, between the *interval_in_days* and the policy value for Ongoing reporting frequency(days):, the lower of the two values is applied. For example, if *interval_in_days* is set to 100, and the value in the in the policy says Ongoing reporting frequency (days):90, RUM reports are sent every 90 days.
	If you do not set an interval, and the default is effective, the reporting interval is determined entirely by the policy value. For example, if the default value is effective and only unenforced licenses are in use, if the policy states that reporting is not required, then RUM reports are not sent.
utility [**customer_info** { **city** *city* | **country** *country* | **postalcode** *postalcode* | **state** *state* | **street** *street* }]	Although visible on the CLI, this option is not supported.

Command Default   Cisco IOS XE Amsterdam 17.3.1 or earlier: Smart Licensing is enabled by default.

Cisco IOS XE Amsterdam 17.3.2a and later: Smart Licensing Using Policy is enabled by default.

Command Modes   Global config (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Release	Modification
Cisco IOS XE Amsterdam 17.3.2a	The following keywords and variables were introduced with Smart Licensing Using Policy: • Under the **url** keyword, these options were introduced: { **cslu** *cslu_url* | **smart** *smart_url* } • Under the **transport** keyword, these options were introduced: { **cslu** | **off** } Further, the default transport type was changed from **callhome**, to **cslu**. • **usage** { **customer-tags** { **tag1** | **tag2** | **tag3** | **tag4** } *tag_value* | **interval** *interval_in_days* } The following keywords and variables under the **license smart** command are deprecated and no longer available on the CLI: **enable** and **conversion automatic**.
Cisco IOS XE Amsterdam 17.3.3	SSM On-Prem support was introduced. For product instance-initiated communication in an SSM On-Prem deployment, the existing [**no**]**license smart url cslu** *cslu_or_on-prem_url* command supports the configuration of a URL for SSM On-Prem as well. But the required URL format for SSM On-Prem is: `http://<ip>/cslu/v1/pi/<tenant ID>`. The corresponding transport mode that must be configured is also an existing command (**license smart transport cslu**).
Cisco IOS XE Cupertino 17.7.1	If version privacy is disabled (**no license smart privacy version** global configuration command), the Cisco IOS-XE software version running on the product instance and the Smart Agent version is *included* in the RUM report. To exclude version information from the RUM report, version privacy must be enabled (**license smart privacy version**).
Cisco IOS XE Cupertino 17.9.1	• A new mechanism to send all data privacy related information was introduced. This information is no longer included in a RUM report. If data privacy is disabled (**no license smart privacy** {**all** | **hostname** | **version**} global configuration command), data privacy related information is sent in a separate sync message or offline file. • Support for sending hostname information was introduced. If the privacy setting for the hostname is disabled (**no license smart privacy hostname** global configuration command), hostname information is sent from the product instance, in a separate sync message, or offline file. Depending on the topology you have implemented, the hostname information is received by CSSM, CSLU, or SSM On-Prem. It is also displayed on the corresponding user interface.

Usage Guidelines   **Data Privacy Settings**

When you disable a privacy setting, the topology you have implemented determines the recipient and how the information reaches its destination:

- The recipient of the information may be one or more of the following: CSSM, CSLU, and SSM On-Prem. The privacy setting has no effect on a controller (Cisco DNA Center).

  In case of the **hostname** keyword, after the hostname information is received by CSSM, CSLU, or SSM On-Prem, it is also displayed on the corresponding UIs – as applicable. If you then *enable* privacy the corresponding UIs revert to displaying the UDI of the product instance.

- How the information is sent.

  - In case of a topology where the product instance initiates communication, the product instance initiates the sending of this information in a message, to CSSM, or CSLU, or SSM On-Prem.

    The product instance sends the hostname sent every time one of the following events occur: the product instance boots up, the hostname changes, there is a switchover in a High Availability set-up.

  - In case of a topology where CSLU or SSM On-Prem initiate communication, the corresponding component initiates the retrieval of privacy information from the product instance.

    The hostname is retrieved at the frequency you configure in CSLU or SSM On-Prem, to retrieve information.

  - In case of a topology where the product instance is in an air-gapped network, privacy information is included in the offline file that is generated when you enter the **license smart save usage** privileged EXEC command.

> **Note** For all topologies, data privacy related information is *not* included in the RUM report.

Data privacy related information it is not stored by the product instance *prior* to sending or saving. This ensures that if and when information is sent, it is consistent with the data privacy setting at the time of sending or saving.

Communication failures and reporting

The reporting interval that you configure (**license smart usage interval** *interval_in_days* command), determines the date and time at which the product instance sends out the RUM report. If the scheduled interval coincides with a communication failure, the product instance attempts to send out the RUM report for up to four hours after the scheduled time has expired. If it is still unable to send out the report (because the communication failure persists), the system resets the interval to 15 minutes. Once the communication failure is resolved, the system reverts the reporting interval to the value that you last configured.

The system message you may see in case of a communicatin failure is %SMART_LIC-3-COMM_FAILED. For information about resolving this error and restoring the reporting interval value, in the software configuration guide of the required release (17.3.x onwards), see *System Configuration > Smart Licensing Using Policy > Troubleshooting Smart Licensing Using Policy*.

Proxy server acceptance

When configuring the **license smart proxy** {**address** *address_hostname* | **port***port*} command, note the change in the criteria for the acceptance of proxy servers, starting with Cisco IOS XE Bengaluru 17.6.1: only the status code of the proxy server response is verified by the system and not the reason phrase. The RFC

format is `status-line = HTTP-version SP status-code SP reason-phrase CRLF`, where the status code is a three-digit numeric code. For more information about the status line, see section 3.1.2 of RFC 7230.

Examples

Examples for Data Privacy

The following examples show how to configure data privacy related information using **license smart privacy** command in global configuration mode. The accompanying **show license status** output displays configured information.

> **Note** The output of the **show** command only tells you if a particular option is enabled or disabled.

Here, no data privacy related information information is sent:

```
Device# configure terminal
Device(config)# license smart privacy all
Device(config)# exit
Device# show license status
<output truncated>
Data Privacy:
  Sending Hostname: no
    Callhome hostname privacy: ENABLED
    Smart Licensing hostname privacy: ENABLED
  Version privacy: ENABLED

Transport:
  Type: Callhome
<output truncated>
```

Here, the software version running on the product instance is Cisco IOS XE Cupertino 17.9.1. Version privacy is disabled, and the Cisco IOS-XE software version running on the product instance and the Smart Agent version is included in the RUM report:

```
Device# configure terminal
Device(config)# license smart privacy hostname
Device(config)# no license smart privacy version
Device(config)# exit

Device# show license all
<output truncated>

Data Privacy:
  Sending Hostname: no
    Callhome hostname privacy: DISABLED
    Smart Licensing hostname privacy: ENABLED
  Version privacy: DISABLED

Transport:
  Type: Smart
  URL: https://smartreceiver.cisco.com/licservice/license
```

```
  Proxy:
    Not Configured
  VRF:
    Not Configured

<output truncated>
```

Here, the software version running on the product instance is Cisco IOS XE Cupertino 17.9.1. The hostname is included and version information is excluded in the message initiated from the product instance. The product instance is directly connected to CSSM (transport type is **smart**, with the corresponding URL).

```
Device# configure terminal
Device(config)# license smart privacy version
Device(config)# no license smart privacy hostname
Device(config)# exit

Device# show license all
<output truncated>

Data Privacy:
  Sending Hostname: no
    Callhome hostname privacy: DISABLED
    Smart Licensing hostname privacy: ENABLED
  Version privacy: DISABLED

Transport:
  Type: Smart
  URL: https://smartreceiver.cisco.com/licservice/license
  Proxy:
    Not Configured
  VRF:
    Not Configured

<output truncated>
```

Examples for Transport Type and URL

The following examples show how to configure some of the transport types using the **license smart transport** and the **license smart url** commands in global configuration mode. The accompanying **show license all** output displays configured information.

Transport **cslu**:

```
Device# configure terminal
Device(config)# license smart transport cslu
Device(config)# license smart url default
Device(config)# exit
Device# show license all
<output truncated>
Transport:
  Type: cslu
  Cslu address: http://192.168.0.1:8182/cslu/v1/pi
  Proxy:
    Not Configured
<output truncated>
```

Transport **smart**:

```
Device# configure terminal
Device(config)# license smart transport smart
Device(config)# license smart url smart https://smartreceiver.cisco.com/licservice/license
```

```
Device(config)# exit
Device# show license all
<output truncated>
Transport:
  Type: Smart
  URL: https://smartreceiver-stage.cisco.com/licservice/license
  Proxy:
    Not Configured
<output truncated>
```

Examples for Usage Reporting Options

The following examples show how to configure some of the usage reporting settings using the **license smart usage** command in global configuration mode. The accompanying **show running-config** output displays configured information.

Configuring the **customer-tag** option:

```
Device# configure terminal
Device(config)# license smart usage customer-tags tag1 SA/VA:01
Device(config)# exit
Device# show running-config | include tag1
license smart usage customer-tags tag1 SA/VA:01
```

Configuring a narrower reporting interval than the currently applied policy:

```
Device# show license status
<output truncated>
Usage Reporting:
Last ACK received: Sep 22 13:49:38 2020 PST
Next ACK deadline: Dec 21 12:02:21 2020 PST
Reporting push interval: 30 days
Next ACK push check: Sep 22 12:20:34 2020 PST
Next report push: Oct 22 12:05:43 2020 PST
Last report push: Sep 22 12:05:43 2020 PST
Last report file write: <none>
<output truncated>

Device# configure terminal
Device(config)# license smart usage interval 20
Device(config)# exit
Device# show license status
<output truncated>

Usage Reporting:
Last ACK received: Sep 22 13:49:38 2020 PST
Next ACK deadline: Nov 22 12:02:21 2020 PST
Reporting push interval: 20 days
Next ACK push check: Sep 22 12:20:34 2020 PST
Next report push: Oct 12 12:05:43 2020 PST
Last report push: Sep 22 12:05:43 2020 PST
Last report file write: <none>
<output truncated>
```

license smart (privileged EXEC)

To configure licensing functions such as requesting or returning authorization codes, saving Resource Utilization Measurement reports (RUM reports), importing a file on to a product instance, establishing trust with Cisco Smart Software Manager (CSSM), synchronizing the product instance with CSSM, or Cisco Smart License Utility (CSLU), or Smart Software Manager On-Prem (SSM On-Prem), and removing licensing information from the product instance, enter the **license smart** command in privileged EXEC mode with the corresponding keyword or argument.

license smart { **authorization** { **request** { **add** | **replace** | **save** *filepath_filename* } *feature_name* { **all** | **local** } | **return** { **all** | **local** } { **offline** [*filepath_filename*] | **online** } } | **clear eventlog** | **export return** { **all** | **local** } *feature_name* | **factory reset** | **import** *filepath_filename* | **save** { **trust-request** *filepath_filename* | **usage** { **all** | **days** *days* | **rum-id** *rum-ID* | **unreported** } { **file** *filepath_filename* } } | **sync** { **all** | **local** } | **trust idtoken** *id_token_value* { **local** | **all** } [**force**] }

Syntax Description	**smart**	Provides options for Smart Licensing.
	authorization	Provides the option to request for, or return, authorization codes.
		Authorization codes are required *only* if you use licenses with enforcement type: export-controlled or enfored.
	request	Requests an authorization code from CSSM, CSLU (CSLU in-turn fetches it from CSSM), or SSM On-Prem and installs it on the product instance.
	add	Adds the requested license to the existing authorization code. The new authorization code will contain all the licenses of the existing authorization code and the requested license.
	replace	Replaces the existing authorization code. The new authorization code will contain only the requested license. All licenses in the current authorization code are returned.
		When you enter this option, the product instance verifies if licenses that correspond to the authorization codes that will be removed, are in-use. If licenses are being used, an error message tells you to first disable the corresponding features.
	save*filepath_filename*	Saves the authorization code request to a file.
		For *filepath_filename*, specify the absolute path to the file, including the filename.
	feature_name	Name of the license for which you are requesting an authorization code.
	all	Performs the action for all product instances in a High Availability configuration.
	local	Performs the action for the *active* product instance. This is the default option.
	return	Returns an authorization code back to the license pool in CSSM.

offline *filepath_filename*	Means the product instance is not connected to CSSM. The authorization code is returned offline. This option requires you to print the return code to a file. Optionally, you can also specify a path to save the file. The file format can be any readable format, such as `.txt` If you choose the offline option, you must complete the additional step of copying the return code from the CLI or the saved file and entering it in CSSM.
online	Means that the product instance is in a connected mode. The authorization code is returned to CSLU or CSSM directly.
clear eventlog	Clears all event log files from the product instance.
export return	Returns the authorization key for an export-controlled license.
factory reset	Clears all saved licensing information from the product instance.
import *filepath_filename*	Imports a file on to the product instance. The file may be that of an authorization code, a trust code, or, or a policy. For *filepath_filename*, specify the location, including the filename.
save	Provides options to save RUM reports or trust code requests.
trust-request *filepath_filename*	Saves the trust code request for the active product instance in the specified location. For *filepath_filename*, specify the absolute path to the file, including the filename.
usage { **all** | **days** *days* | **rum-id** *rum-ID* | **unreported** } { **file** *file_path* }	Saves RUM reports (license usage information) in the specified location. You must specify one of these options: • **all**: Saves all RUM reports. • **days** *days*: Saves RUM report for the last *n* number of days (excluding the current day). Enter a number. The valid range is 0 to 4294967295. For example, if you enter 3, RUM reports of the last three days are saved. • **rum-Id** *rum-ID*: Saves a specified RUM ID. The valid value range is 0 to 18446744073709551615. • **unreported**: Saves all unreported RUM reports. **file** *filepath_filename*: Saves the specified usage information to a file. Specify the absolute path to the file, including the filename.

sync { **all** | **local** }	Synchronizes with CSSM or CSLU, or SSM On-Prem, to send and receive any pending data. This includes uploading pending RUM reports, downloading the ACK response, any pending authorization codes, trust codes, and policies for the product instance.	
	Specify the product instance by entering one of these options:	
	• **all**: Performs synchronization for all the product instances in a High Availability set-up. If you choose this option, the product instance also sends the list of all the UDIs in the synchronization request.	
	• **local**: Performs synchronization only for the active product instance sending the request, that is, its own UDI. This is the default option.	
trust idtoken *id_token_value*	Establishes a trusted connection with CSSM.	
	To use this option, you must first generate a token in the CSSM portal. Provide the generated token value for *id_token_value*.	
force	Submits a trust code request even if a trust code already exists on the product instance.	
	A trust code is node-locked to the UDI of a product instance. If the UDI is already registered, CSSM does not allow a new registration for the same UDI. Entering the **force** keyword overrides this behavior.	

Command Default	Cisco IOS XE Amsterdam 17.3.1 or earlier: Smart Licensing is enabled by default.
	Cisco IOS XE Amsterdam 17.3.2a and later: Smart Licensing Using Policy is enabled by default.
Command Modes	Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Release	Modification
Cisco IOS XE Amsterdam 17.3.2a	The following keywords and variables were introduced with Smart Licensing Using Policy: • **authorization** { **request** { **add** | **replace** } *feature_name* { **all** | **local** } | **return** { **all** | **local** } { **offline** [*path*] | **online** } } • **import** *file_path* • **save** { **trust-request** *filepath_filename* | **usage** { **all** | **days** *days* | **rum-id** *rum-ID* | **unreported** } { **file** *file_path* } } • **sync** { **all** | **local** } • **trust idtoken** *id_token_value* { **local** | **all** } [**force**] The following keywords and variables under the **license smart** command are deprecated and no longer available on the CLI: • **register idtoken** *token_id* [**force**] • **renew id** { **ID** | **auth** } • **debug** { **error** | **debug** | **trace** | **all** } • **reservation** { **cancel** [**all** | **local**] | **install** [**file**] *key* | **request** { **all** | **local** | **universal** } | **return** [**all** | **authorization** { *auth_code* | **file** *filename* } | **Local**] *key* } • **mfg reservation** { **request** | **install** | **install file** | **cancel** } • **conversion** { **start** | **stop** }
Cisco IOS XE Amsterdam 17.3.3	Support for SSM On-Prem was introduced. You can perform licensing-related tasks such as saving Resource Utilization Measurement reports (RUM reports), importing a file on to a product instance, synchronizing the product instance, returning authorization codes, and removing licensing information from the product instance in an SSM On-Prem deployment.
Cisco IOS XE Cupertino 17.7.1	The following enhancements were introduced in this release: • The **save** *filepath_filename* keyword and variable was added to the **license smart authorization request** string. Although visible on the CLI, the new keywords are not applicable, because there are no export-controlled or enforced licenses on any of the Cisco Catalyst Wireless Controllers. • The existing **license smart save usage** command was enhanced to include a trust code request in applicable topologies.

Usage Guidelines

Overwriting a Trust Code

Use case for the **force** option when configuring the **license smart trust idtoken** command: You use same token for all the product instances that are part of one Virtual Account. If the product instance has moved

from one account to another (for instance, because it was added to a High Availability set-up, which is part of another Virtual Account), then there may be an existing trust code you have to overwrite.

Removing Licensing Information

Entering the **licence smart factory reset** command removes all licensing information (except the licenses in-use) from the product instance, including any authorization codes, RUM reports etc. Therefore, we recommend the use of this command only if the product instance is being returned (Return Material Authrization, or RMA), or being decommissioned permanently. We also recommend that you send a RUM report to CSSM, before you remove licensing information from the product instance - this is to ensure that CSSM has up-to-date usage information.

Authorization Codes and License Reservations:

Options relating to authorization codes and license reservations:

- Since there are no export-controlled or enforced licenses on any of the Cisco Catalyst Wireless Controllers, and the notion of reserved licenses is not applicable in the Smart Licensing Using Policy environment, the following commands are not applicable:

  - { { **license smart authorization request** { **add** | **replace** | **save** *path* } *feature_name* { **all** | **local** } *request_count* } }

  - **license smart export return**

- The following option is applicable and required for any SLR authorization codes you may want to return:

  license smart authorization return { **all** | **local** } { **offline** [*path*] | **online** }

Examples

- Example for Saving Licensing Usage Information, on page 557

- Example for Installing a Trust Code, on page 558

- Example for Returning an SLR Authorization Code, on page 558

Example for Saving Licensing Usage Information

The following example shows how you can save license usage information on the product instance. You can use this option to fulfil reporting requirements in an air-gapped network. In the example, the file is first save to flash memory and then copied to a TFTP location:

```
 Device> enable
Device# license smart save usage unreported file flash:RUM-unrep.txt
Device# dir
Directory of bootflash:/

33      -rw-           5994  Nov 2 2020 03:58:04 +05:00  RUM-unrep.txt

Device# copy flash:RUM-unrep.txt tftp://192.168.0.1//auto/tftp-user/user01/
Address or name of remote host [192.168.0.1]?
Destination filename [//auto/tftp-user/user01/RUM-unrep.txt]?
!!
15128 bytes copied in 0.161 secs (93963 bytes/sec)
```

After you save RUM reports to a file, you must upload it to CSSM (from a workstation that has connectivity to the internet, and Cisco).

Example for Installing a Trust Code

The following example shows how to install a trust code even if one is already installed on the product instance. This requires connectivity to CSSM. The accompanying **show license status** output shows sample output after successful installation:

Before you can install a trust code, you must generate a token and download the corresponding file from CSSM.

Use the **show license status** command (`Trust Code Installed:`) to verify results.

```
Device> enable
Device# license smart trust idtoken
NGMwMjk5mYtNZaxMS00NzMZmtgWm local force

Device# show license status
<output truncated>
Trust Code Installed:
  Active: PID:C9800-CL-K9,SN:93BBAH93MGS
    INSTALLED on Nov 02 05:19:05 2020 IST
  Standby: PID:C9800-CL-K9,SN:9XECPSUU4XN
    INSTALLED on Nov 02 05:19:05 2020 IST
<output truncated>
```

Example for Returning an SLR Authorization Code

The following example shows how to remove and return an SLR authorization code. Here the code is returned offline (no connectivity to CSSM). The accompanying **show license all** output shows sample output after successful return:

```
Device> enable
Device# show license all
<output truncated>
License Authorizations
======================
Overall status:
  Active: PID:C9800-CL-K9,SN:93BBAH93MGS
      Status: SPECIFIC INSTALLED on Nov 02 03:16:01 2020 IST
      Last Confirmation code: 102fc949
  Standby: PID:C9800-CL-K9,SN:9XECPSUU4XN
      Status: SPECIFIC INSTALLED on Nov 02 03:15:45 2020 IST
      Last Confirmation code: ad4382fe
<output truncated>

Device# license smart authorization return local offlline
Enter this return code in Cisco Smart Software Manager portal:
UDI: PID:C9800-CL-K9,SN:93BBAH93MGS
    Return code: CqaUPW-WSPYiq-ZNU2ci-SnWydS-hBCXHP-MuyPqy-PJ1GiG-tPTGQj-S2h
UDI: PID:C9800-CL-K9,SN:9XECPSUU4XN
    Return code: CNLwxR-eWiAEJ-XaTEQg-j4rrYW-dSRz9j-37VpcP-imjuLD-mNeA4k-TXA

Device# show license all
<output truncated>
License Authorizations
======================
Overall status:
```

```
  Active: PID:C9800-CL-K9,SN:93BBAH93MGS
      Status: NOT INSTALLED
      Last return code: CqaUPW-WSPYiq-ZNU2ci-SnWydS-hBCXHP-MuyPqy-PJ1GiG-tPTGQj-S2h
  Standby: PID:C9800-CL-K9,SN:9XECPSUU4XN
      Status: NOT INSTALLED
      Last return code: CNLwxR-eWiAEJ-XaTEQg-j4rrYW-dSRz9j-37VpcP-imjuLD-mNeA4k-TXA
<output truncated>
```

If you choose the **offline** option, you must complete the additional step of copying the return code from the CLI or the saved file and entering it in CSSM.

license wireless high-performance

To upgrade the scale and capacity of a Cisco Catalyst C9800-L-K9 Wireless Controller, use the **license wireless high-performance** command. To unconfigure the high-performance license, use the **no** form of this command.

license wireless high-performance

no license wireless high-performance

Syntax Description	This command has no keywords or arguments
Command Default	High-performance license is not configured
Command Modes	Global(config)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced.
Cisco IOS XE Amsterdam 17.3.2	This command continues to be available and applicable with the introduction of Smart Licensing Using Policy in this release.

Usage Guidelines   This command is synchronized with the standby controller. However, the standby controller should also have a performance license to get the upgraded capacity.

The license can be released back to the license pool by unconfiguring the high-performance license. This releases the license to the license pool so that another controller can make use of it, if needed.

In the case of RMA, the customer should call Cisco Technical Assistance Center (TAC) to remove the product instances from the customer's virtual account so that all the licenses used by the controller are returned to the license pool and can be used on the new hardware.

Reboot the device before configuring the **license wireless high-performance** command.

Example

To upgrade the scale and capacity of a controller, use the following command:

```
Device# configure terminal
Device(config#) license wireless high-performance
```

line vty

To identify a specific line for configuration and begin the command in line configuration mode in a virtual terminal for remote console access, use the **line vty** command.

line vty *line_number*

Syntax Description

line_number	First line number. Valid values range from 0 to 530.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples   The following example shows how to identify a specific line for configuration in a virtual terminal:

```
Device# line vty 10
```

link-local-bridging

To enable the link local bridging for each policy profile, use the **link-local-bridging** command. Use the **no** form of this command to disable the feature.

link-local-bridging

no link-local-bridging

Syntax Description	**link-local-bridging** Enables link-local bridging for each policy profile.

Command Default   None

Command Modes   Wireless policy configuration mode

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to enable link-local bridging for each policy profile:

```
Device# configure terminal
Device(config)# wireless profile policy default-policy-profile
Device(config-wireless-policy)# link-local-bridging
```

local-admin-mac deny

To deny association of clients using Locally Administered Addresses, use the **local-admin-mac deny** command. Use the **no** form of this command to disable the feature.

local-admin-mac deny

no local-admin-mac deny

Syntax Description	**local-admin-mac**	Specifies the locally administered MAC addresses.
	deny	Denies the association of clients using Locally Administered Addresses

Command Default   None

Command Modes   WLAN configuration mode (config-wlan)

Command History	**Release**	**Modification**
	Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Example

The following example shows how to deny association of clients using Locally Administered Addresses:

```
Device# configure terminal
Device(config)# wlan wlan-test 3 ssid-test
Device(config-wlan)# shutdownDevice(config-wlan)# [no] local-admin-mac deny
Device(config-wlan)# no shutdown
```

local-auth ap eap-fast

To configure Flex policy local authentication using EAP Fast method, use the **local-auth ap eap-fast** command.

local-auth ap eap-fast *profile-name*

Syntax Description	*profile-name* Enter eap-fast profile name.

Command Default None

Command Modes config-wireless-flex-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure EAP Fast method authentication on a Flex policy:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile flex profile-name
Device(config-wireless-flex-profile)# local-auth ap eap-fast eap-fast-profile-name
```

local-site

To configure the site as local site, use the **local-site** command.

local-site

Syntax Description

local-site	Configure this site as local site.

Command Default   None

Command Modes   config-site-tag

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to set the current site as local site:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless tag site tag-name
Device(config-site-tag)# local-site
```

location expiry

To configure the location expiry duration, use the **location expiry** command in global configuration mode.

location expiry { **calibrating-client** | **client** | **tags** } *timeout-duration*

Syntax Description		
calibrating-client	Timeout value for calibrating clients.
client	Timeout value for clients.
tags	Timeout value for RFID tags.
timeout-duration	Timeout duration, in seconds.

Command Default   Timeout value is not configured.

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

This example shows how to configure the location expiry duration:

```
Device(config)# location expiry tags 50
```

location notify-threshold

To configure the NMSP notification threshold for RSSI measurements, use the **location notify-threshold** command in global configuration mode. To remove the NMSP notification threshold for RSSI measurements, use the **no** form of this command.

location **notify-threshold** {**client** | **rogue-aps** | **tags** } *db*
no **location** **notify-threshold** {**client** | **rogue-aps** | **tags** }

Syntax Description	**client**	Specifies the NMSP notification threshold (in dB) for clients and rogue clients.
		The valid range for the threshold parameter is 0 to 10 dB, and the default value is 0 dB.
	rogue-aps	Specifies the NMSP notification threshold (in dB) for rogue access points.
		The valid range for the threshold parameter is 0 to 10 dB, and the default value is 0 dB.
	tags	Specifies the NMSP notification threshold (in dB) for RFID tags.
		The valid range for the threshold parameter is 0 to 10 dB, and the default value is 0 dB.
	db	The valid range for the threshold parameter is 0 to 10 dB, and the default value is 0 dB.

Command Default	No default behavior or values.

Command Modes	Global configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure the NMSP notification threshold to 10 dB for clients. A notification NMSP message is sent to MSE as soon as the client RSSI changes by 10 dB:

```
Device# configure terminal
Device(config)# location notify-threshold client 10
Device(config)# end
```

login authentication

To configure login authentication parameters, use the **login authentication** command.

login authentication *word* **default**

Syntax Description

word	Authentication list with a name.
default	Uses the default authentication list.

Command Default None

Command Modes Line configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples The following example shows how to configure login authentication :

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# line console 0
Device(config-line)# login authentication NO_LOGIN
```

login block-for

To configure the login security on the Cisco controller and to set the duration for which the controller has to block further login attempts after a specified number of consecutive failed login attempts within a certain time frame, use the **login block-for** command.

login block-for *duration* **attempts** *attempts* **within** *time-frame*

Syntax Description		
	duration	Specifies the duration in seconds for which the device will block login attempts
	attempts	Number of consecutive failed login attempts
	attempts	Specifies the maximum number of failed attempts
	within	Time frame within which the specified number of consecutive failed login attempts must occur to trigger the blocking
	time-frame	Specifies the time period in seconds

Command Default   None

Command Modes   Global Configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the login security on the controller to set the duration of 60 seconds for which the controller has to block further login attempts after 3 unsuccessful login attempts within a period of 10 seconds.:

```
Device# login block-for 60 attempts 3 within 10
```

lsc-only-auth (mesh)

To configure mesh security to Locally Significant Certificate (LSC) only MAP authentication, use the **lsc-only-auth** command.

lsc-only-auth

Syntax Description   This command has no keywords or arguments.

Command Default   LSC only authentication is enabled.

Command Modes   config-wireless-mesh-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to configure mesh security to LSC only MAP authentication:

```
Device # configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device (config)# wireless profile mesh mesh-profile
Device (config-wireless-mesh-profile)# lsc-only-auth
```

mac-filtering

To enable MAC filtering on a WLAN, use the **mac-filtering** command.

mac-filtering [*mac-authorization-list*]

Syntax Description	*mac-authorization-list*	Name of the Authorization list.

Command Default   None

Command Modes   config-wlan

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to enable MAC filtering on a WLAN:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wlan wlan-name wlan-index SSID-name
Device(config-wlan)# mac-filtering
```

mab request format attribute

To configure the delimiter while configuring MAC filtering on a WLAN, use the **mab request format attribute** command in global configuration mode. To disable the delimiter while configuring MAC filtering on a WLAN, use the **no** form of this command.

mab request format attribute { **1 groupsize** *size* **separator** *separator* [**lowercase** | **uppercase**] | **2** { **0** | **7** | **LINE** } **LINE** *password* | **32 vlan access-vlan** }

no mab request format attribute { **1 groupsize** *size* **separator** *separator* [**lowercase** | **uppercase**] | **2** { **0** | **7** | **LINE** } **LINE** *password* | **32 vlan access-vlan** }

Syntax Description	
1	Specifies the username format used for MAB requests.
groupsize *size*	Specifies the number of hex digits per group.
	The valid values range from 1 to 12.
separator *separator*	Specifies how to separate groups.
	The separators are hyphen (-), colon (:), and full stop (.)
	For more information about the groupsize and separator, refer to the Overview of the Configurable MAB Username and Password.
lowercase	Specifies the username in lowercase format.
uppercase	Specifies the username in uppercase format.
2	Specifies the global password used for all the MAB requests.
0	Specifies the unencrypted password.
7	Specifies the hidden password.
LINE	Specifies the encrypted or unencrypted password.
password	LINE password.
32	Specifies the NAS-Identifier attribute.
vlan	Specifies a VLAN.
access-vlan	Specifies the configured access VLAN.

Command Default   None

Command Modes   Global configuration (config)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Example:

The following example shows how to configure the delimiter while configuring MAC filtering:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# mab request format attribute 1 groupsize 4 separator -
```

mbo

To configure WiFi Alliance Agile Multiband (MBO) on WLAN, use the **mbo** command.

mbo

Syntax Description	This command has no arguments or keywords.
Command Default	MBO is not enabled.
Command Modes	WLAN configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines

This example shows how to configure WiFi Alliance Agile Multiband (MBO) on WLAN:

```
Device# configure terminal
Device(config)# wlan wlan-demo 1 ssid-demo
Device(config-wlan)# mbo
Device(config-wlan)# end
```

Note If you use WPA2 WLAN while configuring MBO for WLAN, you need to enable PMF in your configuration.

management gateway-failover enable

To enable gateway monitoring, use the **management gateway-failover enable** command. To disable gateway monitoring, use the **no** form of this command.

management gateway-failover enable
no management gateway-failover enable

Syntax Description This command has no arguments or keywords.

Command Default None

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced.

This example shows how to enable gateway monitoring:

```
Device# configure terminal
Device(config)# management gateway-failover enable
Device(config)# end
```

management gateway-failover interval

To configure the gateway monitoring interval, use the **management gateway-failover interval** command.

management gateway-failover interval *interval-value*

Syntax Description	*interval-value* Refers to the gateway monitoring interval. The valid range is from 6 to 12. Default value is 8.

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.4.1	This command was introduced.

Usage Guidelines

This example shows how to configure the gateway monitoring interval:

```
Device# configure terminal
Device(config)# management gateway-failover interval 6
Device(config)# end
```

match activated-service-template

To create a condition that evaluates true based on the service template activated on a session, use the **match activated-service-template** command in control class-map filter configuration mode. To create a condition that evaluates true if the service template activated on a session does not match the specified template, use the **no-match activated-service-template** command in control class-map filter configuration mode. To remove the condition, use the **no** form of this command.

match **activated-service-template** *template-name*
no-match **activated-service-template** *template-name*
no {**match** | **no-match**} **activated-service-template** *template-name*

Syntax Description	*template-name*	Name of a configured service template as defined by the **service-template** command.

Command Default The control class does not contain a condition based on the service template.

Command Modes Control class-map filter configuration (config-filter-control-classmap)

Command History

Release	Modification
Cisco IOS XE Release 3.2SE	This command was introduced.

Usage Guidelines The **match activated-service-template** command configures a match condition in a control class based on the service template applied to a session. A control class can contain multiple conditions, each of which will evaluate as either true or false. The control class defines whether all, any, or none of the conditions must evaluate true for the actions of the control policy to be executed.

The **no-match** form of this command specifies a value that results in an unsuccessful match. All other values of the specified match criterion result in a successful match. For example, if you configure the **no-match activated-service-template SVC_1** command, all template values except SVC_1 are accepted as a successful match.

The **class** command associates a control class with a control policy.

Examples The following example shows how to configure a control class that evaluates true if the service template named VLAN_1 is activated on the session:

```
class-map type control subscriber match-all CLASS_1
 match activated-service-template VLAN_1
```

Related Commands

Command	Description
activate (policy-map action)	Activates a control policy or service template on a subscriber session.
class	Associates a control class with one or more actions in a control policy.
match service-template	Creates a condition that evaluates true based on an event's service template.

Command	Description
service-template	Defines a template that contains a set of service policy attributes to apply to subscriber sessions.

match any

To perform a match on any protocol that passes through the device, use the **match any** command.

match any

Command Default

None

Command Modes

config-cmap

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to match any packet passing through the device:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# class-map cmap-name
Device(config-cmap)# match any
```

match application name

To configure the use of the application name as a key field for a flow record, use the **match application name** command in flow record configuration mode. To disable the use of the application name as a key field for a flow record, use the **no** form of this command.

match application name
no match application name

Syntax Description

This command has no arguments or keywords.

Command Default

The application name is not configured as a key field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
15.0(1)M	This command was introduced.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

A flow record requires at least one key field before it can be used in a flow monitor. The key fields differentiate flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

Examples

The following example configures the application name as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match application name
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the application name as a key field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match application name
```

	Command	Description
Related Commands	**collect application name**	Configures the use of application name as a nonkey field for a Flexible NetFlow flow record.
	flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
	flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match day

To perform a match using day, days, or a generic grouping of days (weekends or weekdays), use the **match day** command.

match day *day-string*

Command Default   None

Command Modes   Filter Control Classmap Configuration (config-filter-control-classmap)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Usage Guidelines   You should also disable AAA override for this command to work.

Examples

The following example shows how to perform a match using day:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# class-map type control subscriber match-all class-map-name
Device(config-filter-control-classmap)# match day day-string
```

match device-type

To perform a match using device type, use the **match device-type** command.

match device-type*device-type*

Command Default	None

Command Modes	Filter Control Classmap Configuration (config-filter-control-classmap)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Usage Guidelines You should enable device classifier for the device list to be populated.

Examples

The following example shows how to perform a match using device type:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# class-map type control subscriber match-allclass-map-name
Device(config-filter-control-classmap)# match device-type device-type
```

match eap-type

To perform a match using Extensible Authentication Protocol (EAP), use the **match eap-type** command.

match eap-type {**fast** | **gtc** | **leap** | **md5** | **mschapv2** | **peap** | **tls**}

Syntax Description		
	fast	Flexible authentication through secure tunneling.
	gtc	Generic token card.
	leap	Lightweight extensible authentication protocol.
	md5	MD5-tunneled authentication protocol.
	mschapv2	MSCHAPV2 authentication mechanism.
	peap	Protected extensible authentication protocol.
	tls	Transport layer security.

Command Default None

Command Modes Filter Control Classmap Configuration (config-filter-control-classmap)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Usage Guidelines You should also disable AAA override for this command to work.

Examples

The following example shows how to perform a match using the eap-type PEAP:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# class-map type control subscriber match-all class-map-name
Device(config-filter-control-classmap)# match eap-type  peap
```

match interface

To configure the input and output interfaces as key fields for a flow record, use the **match interface** command in flow record configuration mode. To disable the use of the input and output interfaces as key fields for a flow record, use the **no** form of this command.

match interface {**input** | **output**}
no **match interface** {**input** | **output**}

Syntax Description		
	input	Configures the input interface as a key field.
	output	Configures the output interface as a key field.

Command Default The input and output interfaces are not configured as key fields.

Command Modes Flow record configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

The following example configures the input interface as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match interface input
```

The following example configures the output interface as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match interface output
```

match ipv4

To configure one or more of the IPv4 fields as a key field for a flow record, use the **match ipv4** command in flow record configuration mode. To disable the use of one or more of the IPv4 fields as a key field for a flow record, use the **no** form of this command.

match ipv4 {**destination address** | **protocol** | **source address** | **tos** | **version**}
no match ipv4 {**destination address** | **protocol** | **source address** | **tos** | **version**}

Syntax Description

destination address	Configures the IPv4 destination address as a key field. For more information see match ipv4 destination address, on page 588.
protocol	Configures the IPv4 protocol as a key field.
source address	Configures the IPv4 destination address as a key field. For more information see match ipv4 source address, on page 590.
tos	Configures the IPv4 ToS as a key field.
version	Configures the IP version from IPv4 header as a key field.

Command Default   The use of one or more of the IPv4 fields as a key field for a user-defined flow record is not enabled.

Command Modes   Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

The following example configures the IPv4 protocol as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match ipv4 protocol
```

match ipv4

To configure one or more of the IPv4 fields as a key field for a flow record, use the **match ipv4** command in flow record configuration mode. To disable the use of one or more of the IPv4 fields as a key field for a flow record, use the **no** form of this command.

match ipv4 {**destination address** | **protocol** | **source address** | **tos** | **version**}
no match ipv4 {**destination address** | **protocol** | **source address** | **tos** | **version**}

Syntax Description	**destination address**	Configures the IPv4 destination address as a key field. For more information see match ipv4 destination address, on page 588.
	protocol	Configures the IPv4 protocol as a key field.
	source address	Configures the IPv4 destination address as a key field. For more information see match ipv4 source address, on page 590.
	tos	Configures the IPv4 ToS as a key field.
	version	Configures the IP version from IPv4 header as a key field.

Command Default	The use of one or more of the IPv4 fields as a key field for a user-defined flow record is not enabled.

Command Modes	Flow record configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines	A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

The following example configures the IPv4 protocol as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match ipv4 protocol
```

match ipv4 destination address

To configure the IPv4 destination address as a key field for a flow record, use the **match ipv4 destination address** command in flow record configuration mode. To disable the IPv4 destination address as a key field for a flow record, use the **no** form of this command.

match ipv4 destination address
no match ipv4 destination address

Syntax Description	This command has no arguments or keywords.
Command Default	The IPv4 destination address is not configured as a key field.
Command Modes	Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

To return this command to its default settings, use the **no match ipv4 destination address** or **default match ipv4 destination address** flow record configuration command.

The following example configures the IPv4 destination address as a key field for a flow record:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match ipv4 destination address
```

match ipv4 destination address

To configure the IPv4 destination address as a key field for a flow record, use the **match ipv4 destination address** command in flow record configuration mode. To disable the IPv4 destination address as a key field for a flow record, use the **no** form of this command.

match ipv4 destination address
no match ipv4 destination address

Syntax Description	This command has no arguments or keywords.
Command Default	The IPv4 destination address is not configured as a key field.
Command Modes	Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

To return this command to its default settings, use the **no match ipv4 destination address** or **default match ipv4 destination address** flow record configuration command.

The following example configures the IPv4 destination address as a key field for a flow record:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match ipv4 destination address
```

match ipv4 source address

To configure the IPv4 source address as a key field for a flow record, use the **match ipv4 source address** command in flow record configuration mode. To disable the use of the IPv4 source address as a key field for a flow record, use the **no** form of this command.

match ipv4 source address
no match ipv4 source address

Syntax Description	This command has no arguments or keywords.
Command Default	The IPv4 source address is not configured as a key field.
Command Modes	Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

To return this command to its default settings, use the **no match ipv4 source address** or **default match ipv4 source address** flow record configuration command.

The following example configures the IPv4 source address as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match ipv4 source address
```

match ipv4 source address

To configure the IPv4 source address as a key field for a flow record, use the **match ipv4 source address** command in flow record configuration mode. To disable the use of the IPv4 source address as a key field for a flow record, use the **no** form of this command.

match ipv4 source address
no match ipv4 source address

Syntax Description	This command has no arguments or keywords.
Command Default	The IPv4 source address is not configured as a key field.
Command Modes	Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

To return this command to its default settings, use the **no match ipv4 source address** or **default match ipv4 source address** flow record configuration command.

The following example configures the IPv4 source address as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match ipv4 source address
```

match ipv4 ttl

To configure the IPv4 time-to-live (TTL) field as a key field for a flow record, use the **match ipv4 ttl** command in flow record configuration mode. To disable the use of the IPv4 TTL field as a key field for a flow record, use the **no** form of this command.

match ipv4 ttl
no match ipv4 ttl

Syntax Description	This command has no arguments or keywords.
Command Default	The IPv4 time-to-live (TTL) field is not configured as a key field.
Command Modes	Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match ipv4 ttl** command.

The following example configures IPv4 TTL as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match ipv4 ttl
```

match ipv4 ttl

To configure the IPv4 time-to-live (TTL) field as a key field for a flow record, use the **match ipv4 ttl** command in flow record configuration mode. To disable the use of the IPv4 TTL field as a key field for a flow record, use the **no** form of this command.

match ipv4 ttl
no match ipv4 ttl

Syntax Description	This command has no arguments or keywords.
Command Default	The IPv4 time-to-live (TTL) field is not configured as a key field.
Command Modes	Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match ipv4 ttl** command.

The following example configures IPv4 TTL as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match ipv4 ttl
```

match ipv6

To configure one or more of the IPv6 fields as a key field for a flow record, use the **match ipv6** command in flow record configuration mode. To disable the use of one or more of the IPv6 fields as a key field for a flow record, use the **no** form of this command.

match ipv6   {**destination address** | **protocol** | **source address** | **traffic-class** | **version**}
no match ipv6   {**destination address** | **protocol** | **source address** | **traffic-class** | **version**}

Syntax Description	**destination address**	Configures the IPv4 destination address as a key field. For more information see match ipv6 destination address, on page 596.
	protocol	Configures the IPv6 protocol as a key field.
	source address	Configures the IPv4 destination address as a key field. For more information see match ipv6 source address, on page 600.

Command Default   The IPv6 fields are not configured as a key field.

Command Modes   Flow record configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

The following example configures the IPv6 protocol field as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match ipv6 protocol
```

match ipv6

To configure one or more of the IPv6 fields as a key field for a flow record, use the **match ipv6** command in flow record configuration mode. To disable the use of one or more of the IPv6 fields as a key field for a flow record, use the **no** form of this command.

match ipv6 {**destination address** | **protocol** | **source address** | **traffic-class** | **version**}
no match ipv6 {**destination address** | **protocol** | **source address** | **traffic-class** | **version**}

Syntax Description	**destination address**	Configures the IPv4 destination address as a key field. For more information see match ipv6 destination address, on page 596.
	protocol	Configures the IPv6 protocol as a key field.
	source address	Configures the IPv4 destination address as a key field. For more information see match ipv6 source address, on page 600.

Command Default	The IPv6 fields are not configured as a key field.

Command Modes	Flow record configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

The following example configures the IPv6 protocol field as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match ipv6 protocol
```

match ipv6 destination address

To configure the IPv6 destination address as a key field for a flow record, use the **match ipv6 destination address** command in flow record configuration mode. To disable the IPv6 destination address as a key field for a flow record, use the **no** form of this command.

match ipv6 destination address
no match ipv6 destination address

Syntax Description	This command has no arguments or keywords.
Command Default	The IPv6 destination address is not configured as a key field.
Command Modes	Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

To return this command to its default settings, use the **no match ipv6 destination address** or **default match ipv6 destination address** flow record configuration command.

The following example configures the IPv6 destination address as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match ipv6 destination address
```

match ipv6 destination address

To configure the IPv6 destination address as a key field for a flow record, use the **match ipv6 destination address** command in flow record configuration mode. To disable the IPv6 destination address as a key field for a flow record, use the **no** form of this command.

match ipv6 destination address
no match ipv6 destination address

Syntax Description	This command has no arguments or keywords.
Command Default	The IPv6 destination address is not configured as a key field.
Command Modes	Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

To return this command to its default settings, use the **no match ipv6 destination address** or **default match ipv6 destination address** flow record configuration command.

The following example configures the IPv6 destination address as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match ipv6 destination address
```

match ipv6 hop-limit

To configure the IPv6 hop limit as a key field for a flow record, use the **match ipv6 hop-limit** command in flow record configuration mode. To disable the use of a section of an IPv6 packet as a key field for a flow record, use the **no** form of this command.

match ipv6 hop-limit
no match ipv6 hop-limit

Syntax Description	This command has no arguments or keywords.
Command Default	The use of the IPv6 hop limit as a key field for a user-defined flow record is not enabled by default.
Command Modes	Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

The following example configures the hop limit of the packets in the flow as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match ipv6 hop-limit
```

match ipv6 hop-limit

To configure the IPv6 hop limit as a key field for a flow record, use the **match ipv6 hop-limit** command in flow record configuration mode. To disable the use of a section of an IPv6 packet as a key field for a flow record, use the **no** form of this command.

match ipv6 hop-limit
no match ipv6 hop-limit

Syntax Description	This command has no arguments or keywords.
Command Default	The use of the IPv6 hop limit as a key field for a user-defined flow record is not enabled by default.
Command Modes	Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

The following example configures the hop limit of the packets in the flow as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match ipv6 hop-limit
```

match ipv6 source address

To configure the IPv6 source address as a key field for a flow record, use the **match ipv6 source address** command in flow record configuration mode. To disable the use of the IPv6 source address as a key field for a flow record, use the **no** form of this command.

match ipv6 source address
no match ipv6 source address

Syntax Description This command has no arguments or keywords.

Command Default The IPv6 source address is not configured as a key field.

Command Modes Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

To return this command to its default settings, use the **no match ipv6 source address** or **default match ipv6 source address** flow record configuration command.

The following example configures a IPv6 source address as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match ipv6 source address
```

match ipv6 source address

To configure the IPv6 source address as a key field for a flow record, use the **match ipv6 source address** command in flow record configuration mode. To disable the use of the IPv6 source address as a key field for a flow record, use the **no** form of this command.

match ipv6 source address
no match ipv6 source address

Syntax Description	This command has no arguments or keywords.
Command Default	The IPv6 source address is not configured as a key field.
Command Modes	Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

To return this command to its default settings, use the **no match ipv6 source address** or **default match ipv6 source address** flow record configuration command.

The following example configures a IPv6 source address as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match ipv6 source address
```

match join-time-of-day

To perform a match using time of the day, use the **match join-time-of-day** command.

match join-time-of-day *start-time end-time*

Command Default	None
Command Modes	Filter Control Classmap Configuration (config-filter-control-classmap)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Usage Guidelines Join time is considered for matching. For example, if the match filter is set from 11:00 a.m. to 2:00 p.m., a device joining at 10:59 a.m. is not considered, even if it acquires credentials after 11:00 a.m.

You should also disable AAA override for the command to work.

Examples

The following example shows how to perform a match using the joining time:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# class-map type control subscriber match-all class-map-name
Device(config-filter-control-classmap)# match join-time-of-day start-time end-time
```

match message-type

To set a message type to match a service list, use the **match message-type** command.

match message-type {**announcement** | **any** | **query**}

Syntax Description	**announcement**	Allows only service advertisements or announcements for the Device.
	any	Allows any match type.
	query	Allows only a query from the client for a certain Device in the network.

Command Default	None

Command Modes	Service list configuration.

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   Multiple service maps of the same name with different sequence numbers can be created, and the evaluation of the filters will be ordered on the sequence number. Service lists are an ordered sequence of individual statements, with each one having a permit or deny result. The evaluation of a service list consists of a list scan in a predetermined order, and an evaluation of the criteria of each statement that matches. A list scan is stopped once the first statement match is found and a permit/deny action associated with the statement match is performed. The default action after scanning through the entire list is to deny.

Note   It is not possible to use the **match** command if you have used the **service-list mdns-sd** *service-list-name* **query** command. The **match** command can be used only for the **permit** or **deny** option.

Example

The following example shows how to set the announcement message type to be matched:

```
Device(config-mdns-sd-sl)# match message-type announcement
```

match non-client-nrt

To match non-client NRT (non-real-time), use the **match non-client-nrt** command in class-map configuration mode. Use the **no** form of this command to return to the default setting.

match non-client-nrt
no match non-client-nrt

Syntax Description	This command has no arguments or keywords.
Command Default	None
Command Modes	Class-map

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines None

This example show how you can configure non-client NRT:

```
Device(config)# class-map test_1000
Device(config-cmap)# match non-client-nrt
```

match protocol

To configure the match criterion for a class map on the basis of a specified protocol, use the **match protocol** command in class-map configuration or policy inline configuration mode. To remove the protocol-based match criterion from the class map, use the **no** form of this command. For more information about the **match protocol** command, refer to the *Cisco IOS Quality of Service Solutions Command Reference*.

match protocol {*protocol-name* | **attribute category** *category-name* | **attribute sub-category** *sub-category-name* | **attribute application-group** *application-group-name*}

Syntax Description	*protocol-name*	Name of the protocol (for example, bgp) used as a matching criterion.
	category-name	Name of the application category used as a matching criterion.
	sub-category-name	Name of the application subcategory used as a matching criterion.
	application-group-name	Name of the application group as a matching criterion. When the application name is specified, the application is configured as the match criterion instead of the application group.

Command Default	No match criterion is configured.

Command Modes	Class-map configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to create class maps with apply match protocol filters for application name, category, and sub category:

```
Device# configure terminal
Device(config)# class-map cat-browsing
Device(config-cmap)# match protocol attribute category browsing
Device(config-cmap)#end

Device# configure terminal
Device(config)# class-map cat-fileshare
Device(config-cmap)# match protocol attribute category file-sharing
Device(config-cmap)#end

Device# configure terminal
Device(config)# class-map match-any subcat-terminal
Device(config-cmap)# match protocol attribute sub-category terminal
Device(config-cmap)#end

Device# configure terminal
Device(config)# class-map match-any webex-meeting
Device(config-cmap)# match protocol webex-meeting
Device(config-cmap)#end
```

This example shows how to create policy maps and define existing class maps for upstream QoS:

```
Device# configure terminal
Device(config)# policy-map test-avc-up
Device(config-pmap)# class cat-browsing
Device(config-pmap-c)# police 150000
Device(config-pmap-c)# set dscp 12
Device(config-pmap-c)#end


Device# configure terminal
Device(config)# policy-map test-avc-up
Device(config-pmap)# class cat-fileshare
Device(config-pmap-c)# police 1000000
Device(config-pmap-c)# set dscp 20
Device(config-pmap-c)#end


Device# configure terminal
Device(config)# policy-map test-avc-up
Device(config-pmap)# class subcat-terminal
Device(config-pmap-c)# police 120000
Device(config-pmap-c)# set dscp 15
Device(config-pmap-c)#end

Device# configure terminal
Device(config)# policy-map test-avc-up
Device(config-pmap)# class webex-meeting
Device(config-pmap-c)# police 50000000
Device(config-pmap-c)# set dscp 21
Device(config-pmap-c)#end
```

This example shows how to create policy maps and define existing class maps for downstream QoS:

```
Device# configure terminal
Device(config)# policy-map test-avc-down
Device(config-pmap)# class cat-browsing
Device(config-pmap-c)# police 200000
Device(config-pmap-c)# set dscp 10
Device(config-pmap-c)#end


Device# configure terminal
Device(config)# policy-map test-avc-up
Device(config-pmap)# class cat-fileshare
Device(config-pmap-c)# police 300000
Device(config-pmap-c)# set wlan user-priority 2
Device(config-pmap-c)# set dscp 20
Device(config-pmap-c)#end


Device# configure terminal
Device(config)# policy-map test-avc-up
Device(config-pmap)# class subcat-terminal
Device(config-pmap-c)# police 100000
Device(config-pmap-c)# set dscp 25
Device(config-pmap-c)#end

Device# configure terminal
Device(config)# policy-map test-avc-up
Device(config-pmap)# class webex-meeting
Device(config-pmap-c)# police 60000000
```

```
Device(config-pmap-c)# set dscp 41
Device(config-pmap-c)#end
```

This example shows how to apply defined QoS policy on a WLAN:

```
Device# configure terminal
Device(config)#wlan  alpha
Device(config-wlan)#shut
Device(config-wlan)#end
Device(config-wlan)#service-policy client input test-avc-up
Device(config-wlan)#service-policy client output test-avc-down
Device(config-wlan)#no shut
Device(config-wlan)#end
```

match service-instance

To set a service instance to match a service list, use the **match service-instance** command.

match service-instance *line*

Syntax Description

line	Regular expression to match the service instance in packets.

Command Default   None

Command Modes   Service list configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   It is not possible to use the **match** command if you have used the **service-list mdns-sd** *service-list-name* **query** command. The **match** command can be used only for the **permit** or **deny** option.

Example

The following example shows how to set the service instance to match:

```
Device(config-mdns-sd-sl)# match service-instance servInst 1
```

match service-type

To set the value of the mDNS service type string to match, use the **match service-type** command.

match service-type *line*

Syntax Description

line	Regular expression to match the service type in packets.

Command Default   None

Command Modes   Service list configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   It is not possible to use the **match** command if you have used the **service-list mdns-sd** *service-list-name* **query** command. The **match** command can be used only for the **permit** or **deny** option.

Example

The following example shows how to set the value of the mDNS service type string to match:

```
Device(config-mdns-sd-sl)# match service-type _ipp._tcp
```

match transport

To configure one or more of the transport fields as a key field for a flow record, use the **match transport** command in flow record configuration mode. To disable the use of one or more of the transport fields as a key field for a flow record, use the **no** form of this command.

Syntax Description	**destination-port**	Configures the transport destination port as a key field.
	source-port	Configures the transport source port as a key field.

Command Default The transport fields are not configured as a key field.

Command Modes Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

The following example configures the destination port as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match transport destination-port
```

The following example configures the source port as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match transport source-port
```

match transport

To configure one or more of the transport fields as a key field for a flow record, use the **match transport** command in flow record configuration mode. To disable the use of one or more of the transport fields as a key field for a flow record, use the **no** form of this command.

Syntax Description

destination-port	Configures the transport destination port as a key field.
source-port	Configures the transport source port as a key field.

Command Default   The transport fields are not configured as a key field.

Command Modes   Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

The following example configures the destination port as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match transport destination-port
```

The following example configures the source port as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match transport source-port
```

match transport icmp ipv4

To configure the ICMP IPv4 type field and the code field as key fields for a flow record, use the **match transport icmp ipv4** command in flow record configuration mode. To disable the use of the ICMP IPv4 type field and code field as key fields for a flow record, use the **no** form of this command.

match transport icmp ipv4 {**code** | **type**}
no match transport icmp ipv4 {**code** | **type**}

Syntax Description

code	Configures the IPv4 ICMP code as a key field.
type	Configures the IPv4 ICMP type as a key field.

Command Default
The ICMP IPv4 type field and the code field are not configured as key fields.

Command Modes
Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines
A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

The following example configures the IPv4 ICMP code field as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match transport icmp ipv4 code
```

The following example configures the IPv4 ICMP type field as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match transport icmp ipv4 type
```

match transport icmp ipv4

To configure the ICMP IPv4 type field and the code field as key fields for a flow record, use the **match transport icmp ipv4** command in flow record configuration mode. To disable the use of the ICMP IPv4 type field and code field as key fields for a flow record, use the **no** form of this command.

match transport icmp ipv4   {**code** | **type**}
no match transport icmp ipv4   {**code** | **type**}

Syntax Description

code	Configures the IPv4 ICMP code as a key field.
type	Configures the IPv4 ICMP type as a key field.

Command Default

The ICMP IPv4 type field and the code field are not configured as key fields.

Command Modes

Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

The following example configures the IPv4 ICMP code field as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match transport icmp ipv4 code
```

The following example configures the IPv4 ICMP type field as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match transport icmp ipv4 type
```

match transport icmp ipv6

To configure the ICMP IPv6 type field and the code field as key fields for a flow record, use the **match transport icmp ipv6** command in flow record configuration mode. To disable the use of the ICMP IPv6 type field and code field as key fields for a flow record, use the **no** form of this command.

match transport icmp ipv6   {**code** | **type**}
no match transport icmp ipv6   {**code** | **type**}

Syntax Description

code	Configures the IPv6 ICMP code as a key field.
type	Configures the IPv6 ICMP type as a key field.

Command Default

The ICMP IPv6 type field and the code field are not configured as key fields.

Command Modes

Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

The following example configures the IPv6 ICMP code field as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match transport icmp ipv6 code
```

The following example configures the IPv6 ICMP type field as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match transport icmp ipv6 type
```

match transport icmp ipv6

To configure the ICMP IPv6 type field and the code field as key fields for a flow record, use the **match transport icmp ipv6** command in flow record configuration mode. To disable the use of the ICMP IPv6 type field and code field as key fields for a flow record, use the **no** form of this command.

match transport icmp ipv6   {**code** | **type**}
no match transport icmp ipv6   {**code** | **type**}

Syntax Description	**code** Configures the IPv6 ICMP code as a key field.
	type Configures the IPv6 ICMP type as a key field.

Command Default The ICMP IPv6 type field and the code field are not configured as key fields.

Command Modes Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

The following example configures the IPv6 ICMP code field as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match transport icmp ipv6 code
```

The following example configures the IPv6 ICMP type field as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match transport icmp ipv6 type
```

match user-role

To configure the class-map attribute filter criteria, use the **match user-role** command.

match user-role *user-role*

| **Command Default** | None |

| **Command Modes** | config-filter-control-classmap |

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure a class-map attribute filter criteria:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# class-map type control subscriber match-any map-name
Device(config-filter-control-classmap)# match user-role user-role
```

match username

To create a condition that evaluates true based on an event's username, use the **match username** command in control class-map filter configuration mode. To create a condition that evaluates true if an event's username does not match the specified username, use the **no-match username** command in control class-map filter configuration mode. To remove the condition, use the **no** form of this command.

match **username** *username*
no-match **username** *username*
no {**match** | **no-match**} **username** *username*

Syntax Description

| *username* | Username. |

Command Default

The control class does not contain a condition based on the event's username.

Command Modes

Control class-map filter configuration (config-filter-control-classmap)

Command History

Release	Modification
Cisco IOS XE Release 3.2SE	This command was introduced.

Usage Guidelines

The **match username** command configures a match condition in a control class based on the username. A control class can contain multiple conditions, each of which will evaluate as either true or false. The control class defines whether all, any, or none of the conditions must evaluate true to execute the actions of the control policy.

The **no-match** form of this command specifies a value that results in an unsuccessful match. All other values of the specified match criterion result in a successful match. For example, if you configure the **no-match username josmithe** command, the control class accepts any username value except josmithe as a successful match.

The **class** command associates a control class with a control policy.

Examples

The following example shows how to configure a control class that evaluates true if the username is josmithe:

```
class-map type control subscriber match-all CLASS_1
 match username josmithe
```

Related Commands

Command	Description
class	Associates a control class with one or more actions in a control policy.
policy-map type control subscriber	Defines a control policy for subscriber sessions

match wireless ssid (wireless)

To configure the SSID of the wireless network as a key field for a flow record, use the **match wireless ssid** command in flow record configuration mode. To disable the use of the SSID of the wireless network as a key field for a flow record, use the **no** form of this command

match wireless ssid
no   match wireless ssid

Syntax Description   This command has no arguments or keywords.

Command Default   The SSID of the wireless network is not configured as a key field.

Command Modes   Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   A flow record requires at least one key field before it can be used in a flow monitor. The key fields differentiate flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

The following example configures the SSID of the wireless network as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match wireless ssid
```

match wireless ssid (wireless)

To configure the SSID of the wireless network as a key field for a flow record, use the **match wireless ssid** command in flow record configuration mode. To disable the use of the SSID of the wireless network as a key field for a flow record, use the **no** form of this command

match wireless ssid
no match wireless ssid

Syntax Description	This command has no arguments or keywords.
Command Default	The SSID of the wireless network is not configured as a key field.
Command Modes	Flow record configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines A flow record requires at least one key field before it can be used in a flow monitor. The key fields differentiate flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

The following example configures the SSID of the wireless network as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match wireless ssid
```

match (access-map configuration)

To set the VLAN map to match packets against one or more access lists, use the **match** command in access-map configuration mode. Use the **no** form of this command to remove the match parameters.

{**match ip address** {*namenumber*} [*namenumber*] [*namenumber*]... | **mac address** *name* [*name*] [*name*]...}

{**no match ip address** {*namenumber*} [*namenumber*] [*namenumber*]... | **mac address** *name* [*name*] [*name*]...}

Syntax Description		
ip address	Set the access map to match packets against an IP address access list.
mac address	Set the access map to match packets against a MAC address access list.
name	Name of the access list to match packets against.
number	Number of the access list to match packets against. This option is not valid for MAC access lists.

Command Default The default action is to have no match parameters applied to a VLAN map.

Command Modes Access-map configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines You enter access-map configuration mode by using the **vlan access-map** global configuration command.

You must enter one access list name or number; others are optional. You can match packets against one or more access lists. Matching any of the lists counts as a match of the entry.

In access-map configuration mode, use the **match** command to define the match conditions for a VLAN map applied to a VLAN. Use the **action** command to set the action that occurs when the packet matches the conditions.

Packets are matched only against access lists of the same protocol type; IP packets are matched against IP access lists, and all other packets are matched against MAC access lists.

Both IP and MAC addresses can be specified for the same map entry.

Examples This example shows how to define and apply a VLAN access map *vmap4* to VLANs 5 and 6 that will cause the interface to drop an IP packet if the packet matches the conditions defined in access list *al2*.

```
Device(config)# vlan access-map vmap4
Device(config-access-map)# match ip address al2
Device(config-access-map)# action drop
Device(config-access-map)# exit
```

```
Device(config)# vlan filter vmap4 vlan-list 5-6
```

You can verify your settings by entering the **show vlan access-map** privileged EXEC command.

match (class-map configuration)

To define the match criteria to classify traffic, use the **match** command in class-map configuration mode. Use the **no** form of this command to remove the match criteria.

Cisco IOS XE Everest 16.5.x and Earlier Releases

match {**access-group** {**name**_acl-name acl-index_} | **class-map** _class-map-name_ | **cos** _cos-value_ | **dscp** _dscp-value_ | [**ip**] **dscp** _dscp-list_ | [**ip**] **precedence** _ip-precedence-list_ | **precedence** _precedence-value1...value4_ | **qos-group** _qos-group-value_ | **vlan** _vlan-id_}
no match {**access-group** {**name**_acl-name acl-index_} | **class-map** _class-map-name_ | **cos** _cos-value_ | **dscp** _dscp-value_ | [**ip**] **dscp** _dscp-list_ | [**ip**] **precedence** _ip-precedence-list_ | **precedence** _precedence-value1...value4_ | **qos-group** _qos-group-value_ | **vlan** _vlan-id_}

Cisco IOS XE Everest 16.6.x and Later Releases

match {**access-group** {**name** _acl-name acl-index_} | **cos** _cos-value_ | **dscp** _dscp-value_ | [**ip**] **dscp** _dscp-list_ | [**ip**] **precedence** _ip-precedence-list_ | **mpls** _experimental-value_ | **non-client-nrt** | **precedence** _precedence-value1...value4_ | **protocol** _protocol-name_ | **qos-group** _qos-group-value_ | **vlan** _vlan-id_ | **wlan** _wlan-id_}
no match {**access-group** {**name** _acl-name acl-index_} | **cos** _cos-value_ | **dscp** _dscp-value_ | [**ip**] **dscp** _dscp-list_ | [**ip**] **precedence** _ip-precedence-list_ | **mpls** _experimental-value_ | **non-client-nrt** | **precedence** _precedence-value1...value4_ | **protocol** _protocol-name_ | **qos-group** _qos-group-value_ | **vlan** _vlan-id_ | **wlan** _wlan-id_}

Syntax Description		
access-group	Specifies an access group.
name _acl-name_	Specifies the name of an IP standard or extended access control list (ACL) or MAC ACL.
acl-index	Specifies the number of an IP standard or extended access control list (ACL) or MAC ACL. For an IP standard ACL, the ACL index range is 1 to 99 and 1300 to 1999. For an IP extended ACL, the ACL index range is 100 to 199 and 2000 to 2699.
class-map _class-map-name_	Uses a traffic class as a classification policy and specifies a traffic class name to use as the match criterion.
cos _cos-value_	Matches a packet on the basis of a Layer 2 class of service (CoS)/Inter-Switch Link (ISL) marking. The cos-value is from 0 to 7. You can specify up to four CoS values in one **match cos** statement, separated by a space.
dscp _dscp-value_	Specifies the parameters for each DSCP value. You can specify a value in the range 0 to 63 specifying the differentiated services code point value.

ip dscp *dscp-list*	Specifies a list of up to eight IP Differentiated Services Code Point (DSCP) values to match against incoming packets. Separate each value with a space. The range is 0 to 63. You also can enter a mnemonic name for a commonly used value.
ip precedence *ip-precedence-list*	Specifies a list of up to eight IP-precedence values to match against incoming packets. Separate each value with a space. The range is 0 to 7. You also can enter a mnemonic name for a commonly used value.
precedence *precedence-value1...value4*	Assigns an IP precedence value to the classified traffic. The range is 0 to 7. You also can enter a mnemonic name for a commonly used value.
qos-group *qos-group-value*	Identifies a specific QoS group value as a match criterion. The range is 0 to 31.
vlan *vlan-id*	Identifies a specific VLAN as a match criterion. The range is 1 to 4094.
mpls *experimental-value*	Specifies Multi Protocol Label Switching specific values.
non-client-nrt	Matches a non-client NRT (non-real-time).
protocol *protocol-name*	Specifies the type of protocol.
wlan *wlan-id*	Identifies 802.11 specific values.

Command Default No match criteria are defined.

Command Modes Class-map configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was intro...

Usage Guidelines The **match** command is used to specify which fields in the incoming packets are examined to classify the packets. Only the IP access group or the MAC access group matching to the Ether Type/Len are supported.

If you enter the **class-map match-any***class-map-name* global configuration command, you can enter the following **match** commands:

- **match access-group name** *acl-name*

Note The ACL must be an extended named ACL.

- **match ip dscp** *dscp-list*

- **match ip precedence** *ip-precedence-list*

The **match access-group** *acl-index* command is not supported.

To define packet classification on a physical-port basis, only one **match** command per class map is supported. In this situation, the **match-any** keyword is equivalent.

For the **match ip dscp** *dscp-list* or the **match ip precedence** *ip-precedence-list* command, you can enter a mnemonic name for a commonly used value. For example, you can enter the **match ip dscp af11** command, which is the same as entering the **match ip dscp 10** command. You can enter the **match ip precedence critical** command, which is the same as entering the **match ip precedence 5** command. For a list of supported mnemonics, enter the **match ip dscp ?** or the **match ip precedence ?** command to see the command-line help strings.

Use the **input-interface** *interface-id-list* keyword when you are configuring an interface-level class map in a hierarchical policy map. For the *interface-id-list*, you can specify up to six entries.

Examples

This example shows how to create a class map called class2, which matches all the incoming traffic with DSCP values of 10, 11, and 12:

```
Device(config)# class-map class2
Device(config-cmap)# match ip dscp 10 11 12
Device(config-cmap)# exit
```

This example shows how to create a class map called class3, which matches all the incoming traffic with IP-precedence values of 5, 6, and 7:

```
Device(config)# class-map class3
Device(config-cmap)# match ip precedence 5 6 7
Device(config-cmap)# exit
```

This example shows how to delete the IP-precedence match criteria and to classify traffic using acl1:

```
Device(config)# class-map class2
Device(config-cmap)# match ip precedence 5 6 7
Device(config-cmap)# no match ip precedence
Device(config-cmap)# match access-group acl1
Device(config-cmap)# exit
```

This example shows how to specify a list of physical ports to which an interface-level class map in a hierarchical policy map applies:

```
Device(config)# class-map match-any class4
Device(config-cmap)# match cos 4
Device(config-cmap)# exit
```

This example shows how to specify a range of physical ports to which an interface-level class map in a hierarchical policy map applies:

```
Device(config)# class-map match-any class4
Device(config-cmap)# match cos 4
Device(config-cmap)# exit
```

You can verify your settings by entering the **show class-map** privileged EXEC command.

match wlan user-priority

To match 802.11 specific values, use the **match wlan user-priority** command in class-map configuration mode. Use the **no** form of this command to return to the default setting.

match wlan user-priority *wlan-value* [*wlan-value*] [*wlan-value*] [*wlan-value*]
no match wlan user-priority *wlan-value* [*wlan-value*] [*wlan-value*] [*wlan-value*]

Syntax Description

wlan-value	The 802.11-specific values. Enter the user priority 802.11 TID user priority (0-7). (Optional) Enter up to three user priority values separated by white-spaces.

Command Default   None

Command Modes   Class-map configuration (config-cmap)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   None

This example show how you can configure user-priority values:

```
Device(config)# class-map test_1000
Device(config-cmap)# match wlan user-priority 7
```

max-bandwidth

To configure the wireless media-stream's maximum expected stream bandwidth in Kbps, use the **max-bandwidth** command.

max-bandwidth *bandwidth*

Syntax Description	*bandwidth* Maximum Expected Stream Bandwidth in Kbps. Valid range is 1 to 35000 Kbps.
Command Default	None
Command Modes	media-stream

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure wireless media-stream bandwidth in Kbps:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless media-stream group doc-grp 224.0.0.0 224.0.0.223
Device(config-media-stream)# max-bandwidth 3500
```

max-through

To limit multicast router advertisements (RAs) per VLAN per throttle period, use the **max-through** command in IPv6 RA throttle policy configuration mode. To reset the command to its defaults, use the **no** form of this command.

max-through {*mt-value* | **inherit** | **no-limit**}

Syntax Description	

mt-value	Number of multicast RAs allowed on the VLAN before throttling occurs. The range is from 0 through 256.
inherit	Merges the setting between target policies.
no-limit	Multicast RAs are not limited on the VLAN.

Command Default   10 RAs per VLAN per 10 minutes

Command Modes   IPv6 RA throttle policy configuration (config-nd-ra-throttle)

Command History

Release	Modification
Cisco IOS XE Release 3.2XE	This command was introduced.

Usage Guidelines   The **max-through** command limits the amount of multicast RAs that are passed through to the VLAN per throttle period. This command can be configured only on a VLAN.

Example

```
Device(config)# ipv6 nd ra-throttle policy policy1
Device(config-nd-ra-throttle)# max-through 25
```

mdns-sd

To configure the mDNS service discovery gateway, use the **mdns-sd** command. To disable the configuration, use the **no** form of this command.

mdns-sd { **gateway** | **service-definition** *service-definition-name* | **service-list** *service-list-name* { **IN** | **OUT** } | **service-policy** *service-policy-name* }

no mdns-sd { **gateway** | **service-definition** *service-definition-name* | **service-list** *service-list-name* { **IN** | **OUT** } | **service-policy** *service-policy-name* }

Syntax Description	mdns-sd	Configures the mDNS service discovery gateway.
	gateway	Configures mDNS gateway.
	service-definition	Configures mDNS service definition.
	service-definition-name	Specifies the mDNS service definition name.
	service-list	Configures mDNS service list.
	service-list-name	Specifies the mDNS service definition name.
	IN	Specifies the inbound filtering.
	OUT	Specifies the outbound filtering.
	service-policy	Configures mDNS service policy.
	service-policy-name	Specifies the mDNS service policy name.

Command Default	None
Command Modes	Global configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows how to configure the mDNS service discovery gateway:

```
Device(config)# mdns-sd gateway
```

mdns-sd flex-profile

To configure the mDNS service discovery flex profile, use the **mdns-sd flex-profile** command. To disable the command, use the **no** form of this command.

mdns-sd flex-profile *flex-profile-name*

no mdns-sd flex-profile *flex-profile-name*

Syntax Description	**mdns-sd flex-profile**	Configures the mDNS service discovery flex profile.
	flex-profile-name	Specifies the mDNS flex profile name.

Command Default	None

Command Modes	Global configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Usage Guidelines	None

Example

The following example shows how to configure the mDNS service discovery flex profile:

```
Device(config)# mdns-sd flex-profile mdns-flex-profile
```

mdns-sd profile

To apply the mDNS flex profile to the wireless flex profile, use the **mdns-sd profile** command in the wireless flex profile mode. To disable the command, use the **no** form of this command.

mdns-sd profile *flex-profile-name*

no mdns-sd profile *flex-profile-name*

Syntax Description	**mdns-sd profile**	Configures the mDNS flex profile in the wireless flex profile.
	flex-profile-name	Specifies the mDNS flex profile name.

Command Default	None

Command Modes	Wireless flex profile configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Usage Guidelines	None

Example

The following example shows how to apply the mDNS flex profile to the wireless flex profile:

```
Device(config-wireless-flex-profile)# mdns-sd profile mdns-flex-profile
```

mdns-sd wired-filter

To configure an mDNS wired filter, use the **mdns-sd wired-filter** command.

mdns-sd wired-filter *wired-filter-name*

Syntax Description	*wired-filter-name*	Is the wired filter name.

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.8.1	This command was introduced.

Usage Guidelines

This example shows how to configure an mDNS wired filter:

```
Device# enable
Device# configure terminal
Device(config)# mdns-sd wired-filter WIRED_FILTER_APPLE_TV
Device(config-mdns-wired-filter)# match mac a886.ddb2.05e9
Device(config-mdns-wired-filter)# match vlan 100
Device(config-mdns-wired-filter)# exit
```

method

To configure the primary and secondary supported Online Sign-Up (OSU) method of an OSU operator, use the **method** command. To to remove the OSU method, use the **no** form of the command.

method {**oma-dm** | **soap-xml-sp**}

Syntax Description	**oma-dm**	Sets OMA-DM as the primary or secondary OSU method for an OSU operator.
	soap-xml-sp	Sets SOAP or XML-SPP as the primary or secondary OSU method for an OSU operator.

Command Default	None

Command Modes	ANQP OSU Provider Configuration (config-anqp-osu-provider)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure the primary and secondary supported OSU method of the OSU operator:

```
Device(config-wireless-anqp-server)# osu-provider my-osu
Device(config-anqp-osu-provider)# method soap-xml-spp oma-dm
```

method (mesh)

To configure authentication and authorization method for a mesh AP profile, use the **method** command.

method { **authentication** | **authorization** } *method*

Syntax Description	**authentication**	AAA method for mesh AP authentication.
	authorization	AAA method for mesh AP authorization.
	method	Named method list.

Command Default	Authentication and authorization method is not configured.

Command Modes	config-wireless-mesh-profile

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to configure authentication for a mesh AP profile:

```
Device # configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device (config)# wireless profile mesh mesh-profile
Device (config-wireless-mesh-profile)# method authentication auth1
```

method fast

To configure EAP profile to support EAP-FAST method, use the **method fast** command.

method fast [**profile** *profile-name*]

Syntax Description	*profile-name* Specify the method profile.

Command Default None

Command Modes config-eap-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to enable EAP Fast method on a EAP profile:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# eap profile profile-name
Device(config-eap-profile)# method fast
```

mesh backhaul

To enable mesh backhaul in the radio profile configuration mode, use the **mesh backhaul** command. Use the **no** form of this command to disable the feature.

mesh backhaul

no mesh backhaul

Syntax Description	This command has no keywords or arguments.

Command Default	None

Command Modes	Wireless Radio Profile Configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Usage Guidelines Mesh backhaul can be disabled on specific slot. Mesh backhaul is disabled to stop the specific slot from being the backhaul candidate.

Example

The following example shows you how to enable mesh backhaul in the radio profile configuration mode:

```
Device# configure terminal
Device(config)# wireless radio profile radio-profile-name
Device(config-wireless-radio-profile)# mesh backhaul
```

mesh designated downlink

To enable the radio slot as a designated mesh downlink in the radio profile configuration mode, use the **mesh designated downlink** command. Use the **no** form of this command to disable the feature.

mesh designated downlink

no mesh designated downlink

| Syntax Description | This command has no keywords or arguments. |

Command Default By default this command is disabled. By default all the radio slots are mesh-enabled and not designated as downlink.

Command Modes Wireless Radio Profile Configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Usage Guidelines This command is enabled only for slot 2 of the mesh APs. If a slot other than slot 2 is designated downlink configured as the designated downlink, the following warning message is displayed: Designated downlink is supported only on slot 2 of mesh APs. Associate in the RF tag accordingly.

Example

This example shows how to enable the radio slot as a designated mesh downlink:

```
Device# configure terminal
Device(config)# wireless radio profile radio-profile-name
Device(config-wireless-radio-profile)# mesh designated downlink
```

mgmtuser username

To set a username and password for AP management, use the **mgmtuser username** command. To disable this feature, use the **no** form of this command.

mgmtuser username *username* **password {0 | 8}** *password*

Syntax Description	*username*	Enter a username for AP management.
	0	Specifies an UNENCRYPTED password.
	8	Specifies an AES encrypted password.
	password	Configures the encryption password (key).

Command Default	None

Command Modes	AP Profile Configuration (config-ap-profile)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 17.6.1	This command was introduced.

Examples

The following example shows how to set a username and password for AP management:

```
Device# enable
Device# configure terminal
Device(config)# ap profile default-ap-profile
Device(config-ap-profile)# mgmtuser username myusername password 0
Device(config-ap-profile)# end
```

mobility anchor

To configure mobility sticky anchoring, use the **mobility anchor** command. To disable the mobility anchoring, use the **no** form of the command.

To configure guest anchoring, use the **mobility anchor** *ip-address* command. To delete the guest anchor, use the **no** form of the command.

To configure the device as an auto-anchor, use the **mobility anchor** command.

mobility anchor *ip-address*
no mobility anchor *ip-address*

Syntax Description	*ip-address* Configures the IP address for the guest anchor.

Command Default	None

Command Modes	Wireless policy configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure guest anchoring:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy default-policy-profile
Device(config-wireless-policy)# mobility anchor 209.165.200.224
```

This example shows how to configure the device as an auto-anchor:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy default-policy-profile
Device(config-wireless-policy)# mobility anchor
```

monitor capture (access list/class map)

To configure a monitor capture specifying an access list or a class map as the core filter for the packet capture, use the **monitor capture** command in privileged EXEC mode. To disable the monitor capture with the specified access list or class map as the core filter, use the **no** form of this command.

monitor capture *capture-name* { **access-list** *access-list-name* | **class-map** *class-map-name* }

no monitor capture *capture-name* { **access-list** *access-list-name* | **class-map** *class-map-name* }

Syntax Description	*capture-name*	The name of the capture.
	access-list *access-list-name*	Configures an access list with the specified name.
	class-map *class-map-name*	Configures a class map with the specified name.

Command Default A monitor capture with the specified access list or a class map as the core filter for the packet capture is not configured.

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Release 3.7S	This command was introduced.

Usage Guidelines Configure the access list using the **ip access-list** command or the class map using the **class-map** command before using the **monitor capture** command. You can specify a class map, or an access list, or an explicit inline filter as the core filter. If you have already specified the filter when you entered the **monitor capture match** command, the command replaces the existing filter.

Examples The following example shows how to define a core system filter using an existing access control list:

```
Device> enable
Device# configure terminal
Device(config)# ip access-list standard acl1
Device(config-std-nacl)# permit any
Device(config-std-nacl)# exit
Device(config)# exit
Device# monitor capture mycap access-list acl1
Device# end
```

The following example shows how to define a core system filter using an existing class map:

```
Device> enable
Device# configure terminal
Device(config)# ip access-list standard acl1
Device(config-std-nacl)# permit any
Device(config-std-nacl)# exit
Device(config)# class-map match-all cmap
Device(config-cmap)# match access-group name acl
Device(config-cmap)# exit
```

```
Device(config)# exit
Device# monitor capture mycap class-map classmap1
Device# end
```

monitor capture export

To store captured packets in a file, use the **monitor capture export** command in privileged EXEC mode.

monitor capture *capture-name* **export** *filelocation | file-name*

Syntax Description	*capture-name*	Name of the capture.
	export	Stores all the packets in capture buffer to a file of type .PCAP.
	file-location/file-name	Destination file location and name.

Command Default   The captured packets are not stored.

Command Modes   Privileged EXEC (#)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines   Use the **monitor capture export** command only when the storage destination is a capture buffer. The file may be stored either remotely or locally. Use this command either during capture or after the packet capture has stopped. The packet capture could have stopped because one or more end conditions has been met or you entered the **monitor capture stop** command.

Examples   The following example shows how to export capture buffer contents:

```
Device> enable
Device# monitor capture mycap export tftp://10.1.88.9/mycap.pcap
Device# end
```

monitor capture (interface/control plane)

To configure monitor capture specifying an attachment point and the packet flow direction, use the **monitor capture** command in privileged EXEC mode. To disable the monitor capture with the specified attachment point and the packet flow direction, use the **no** form of this command.

monitor capture *capture-name* { **interface** *type number* | **control-plane** } { **in** | **out** | **both** }

no monitor capture *capture-name* { **interface** *type number* | **control-plane** } { **in** | **out** | **both** }

Syntax Description		
	capture-name	Name of the capture.
	interface *type number*	Configures an interface with the specified type and number as an attachment point.
	control-plane	Configures a control plane as an attachment point.
	in	Specifies the inbound traffic direction.
	out	Specifies the outbound traffic direction.
	both	Specifies both inbound and outbound traffic directions.

Command Default   The monitor packet capture filter specifying is not configured.

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines   Repeat the **monitor capture** command as many times as required to add multiple attachment points.

Examples   The following example shows how to add an attachment point to an interface:

```
Device> enable
Device# monitor capture mycap interface GigabitEthernet 0/0/1 in
Device# end
```

The following example shows how to add an attachment point to a control plane:

```
Device> enable
Device# monitor capture mycap control-plane out
Device# end
```

monitor capture limit

To configure capture limits, use the **monitor capture limit** command in privileged EXEC mode. To remove the capture limits, use the **no** form of this command.

monitor capture *capture-name* **limit** [**duration** *seconds*] [**every** *number*] [**packet-length** *size*] [**packets** *number*] [**pps** *number*]
no monitor capture *name* **limit** [**duration**] [**every**] [**packet-length**] [**packets**] [**pps**]

Syntax Description	*capture-name*	Name of the packet capture.
	duration *seconds*	(Optional) Specifies the duration of the capture, in seconds. The range is from 1 to 1000000.
	every *number*	(Optional) Specifies that, in a series of packets, the packet whose numerical order is denoted by the *number* argument should be captured. The range is from 2 to 100000.
	packet-length *bytes*	(Optional) Specifies the packet length, in bytes. If the actual packet is longer than the specified length, only the first set of bytes whose number is denoted by the *bytes* argument is stored.
	packets *packets-number*	(Optional) Specifies the number of packets to be processed for capture.
	pps *pps-number*	(Optional) Specifies the number of packets to be captured per second. The range is from 1 to 1000000.

Command Default   No capture limits are configured.

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines   If no duration is specified, the capture does not stop until it is manually interrupted. The entire packet is processed if the **packet-length** *bytes* keyword-argument pair is not specified. All matched packets are captured, if the **every** *number* keyword-argument pair is not specified. All matched packets are captured if the **packets** *packets-number* keyword-argument pair is not specified. The incoming packets are captured at the rate of 1 million packets per second if the **pps** *number* keyword-argument pair is not specified.

Examples   The following example shows how to specify capture limits:

```
Device> enable
Device# monitor capture mycap limit duration 10
Device# monitor capture mycap limit packet-length 128
Device# monitor capture mycap limit packets 100
Device# monitor capture mycap limit pps 1000
```

```
Device# monitor capture mycap limit duration 10 packet-length 128 packets 100
Device# end
```

monitor capture match

To define an explicit inline core filter, use the **monitor   capture   match** command in privileged EXEC mode. To remove this filter, use the **no** form of this command.

monitor   capture   *capture-name*   **match**
{ **any** | { **ipv4** | **ipv6** }   { *source-prefix/length* | **any** | **host** }   *source-ip-address*   { { *destination-prefix/length* | **any** | **host** }   *destination-ip-address* } | **protocol**   { **tcp** | **udp** }   { { *source-prefix/length* | **any** | **host** }   { { *destination-prefix/length* | **any** | **host** } | [[**eq** | **gt** | **lt** | **neg**]   *port-number*] | **range**   *start-port-number end-port-number* | [**eq** | **gt** | **lt** | **neg**] *port-number* | **range**   *start-port-number end-port-number* } } | **mac**   { *source-mac-address* | { **any** | **host** }   *source-mac-address* }   *source-mac-address-mask*   { *destination-mac-address* | { **any** | **host** } *destination-mac-address* }   *destination-mac-address-mask* }
no   **monitor   capture**   *capture-name*   **match**

Syntax Description

epc-capture-name	Name of the capture.
any	Specifies all packets.
ipv4	Specifies IPv4 packets.
ipv6	Specifies IPv6 packets.
source-prefix/length	The network prefix and length of the IPv4 or IPv6 source address.
any	Specifies network prefix of any source IPv4 or IPv6 address.
host	Specifies the source host.
source-ip-address	Source IPv4 or IPv6 address.
destination-prefix/length	Destination IPv4 or IPv6 address.
any	Specifies the network prefix and length of any IPv4 or IPv6 destination address.
host	Specifies the destination host.
destination-ip-address	Destination IPv4 or IPv6 address.
protocol	Specifies the protocol.
tcp	Specifies the TCP protocol.
udp	Specifies the UDP protocol.
eq	(Optional) Specifies that only packets with a port number that is equal to the port number associated with the IP address are matched.

gt	(Optional) Specifies that only packets with a port number that is greater than the port number associated with the IP address are matched.
lt	(Optional) Specifies that only packets with a port number that is lower than the port number associated with the IP address are matched.
neq	(Optional) Specifies that only packets with a port number that is not equal to the port number associated with the IP address are matched.
port-number	(Optional) The port number associated with the IP address. The range is from 0 to 65535.
range	(Optional) Specifies the range of port numbers.
start-port-number	(Optional) The start of the range of port numbers. The range is from 0 to 65535.
end-port-number	(Optional) The end of the range of port numbers. The range is from 0 to 65535.
mac	Specifies a Layer 2 packet.
source-mac-address	The source MAC address.
any	Specifies the network prefix of any source MAC address.
host	Specifies the MAC source host.
source-mac-address-mask	The source MAC address mask.
destination-mac-address	The destination MAC address.
any	Specifies the network prefix of any destination MAC address.
host	Specifies the MAC source host.
destination-mac-address-mask	The destination MAC address mask.

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 17.12.1	This command was introduced.

Usage Guidelines   Use the **monitor capture** command to specify the core filter as a class map, access list, or explicit inline filter. Any filter has already specified before you enter the **monitor capture match** command is replaced.

Examples

The following example shows how to set various explicit filters:

```
Device> enable
Device# monitor capture mycap match any
Device# monitor capture mycap match mac any any
Device# monitor capture mycap match ipv4 any any
Device# monitor capture mycap match ipv4 protocol udp 198.51.100.0/24 eq 20001 any
Device# end
```

The following example shows how to set a filter for MAC addresses:

```
Device> enable
Device# monitor capture match mycap mac 0030.9629.9f84 0000.0000.0000 0030.7524.9f84
0000.0000.0000
Device# end
```

The following example shows how to set a filter for IPv4 traffic:

```
Device> enable
Device# monitor capture match mycap ipv4 198.51.100.0/24 198.51.100.1 203.0.113.0/24
203.0.113.254
Device# end
```

monitor capture start

To start the capture of packet data at a traffic trace point into a buffer, use the **monitor capture start** command in privileged EXEC mode.

monitor capture *epc-capture-name* **start**

Syntax Description

epc-capture-name	Name of the capture.

Command Default Data packets are not captured into a buffer.

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines Use the **monitor capture start** command to enable the packet data capture after the capture point is defined. To stop the capture of packet data, use the **monitor capture stop** command.

Ensure that system resources such as CPU and memory are available before starting a capture.

Examples The following example shows how to start capture buffer contents:

```
Device> enable
Device# monitor capture mycap start
Device# monitor capture mycap export tftp://10.1.88.9/mycap.pcap
Device# monitor capture mycap limit packets 100 duration 60
Device# monitor capture mycap start
Device# end
```

monitor capture stop

To stop the capture of packet data at a traffic trace point, use the **monitor   capture   stop** command in privileged EXEC mode.

monitor   capture *epc-capture-name* **stop**

Syntax Description

epc-capture-name	Name of the capture.

Command Default   The packet data capture is ongoing.

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines   Use the **monitor   capture   start** command to start the capture of packet data that you started by using the **monitor   capture   start** command. You can configure two types of capture buffers: linear and circular. When the linear buffer is full, data capture stops automatically. When the circular buffer is full, data capture starts from the beginning and the data is overwritten.

Examples   The following example shows how to stop capture buffer contents:

```
Device> enable
Device# monitor capture mycap stop
Device# end
```

mop enabled

To enable an interface to support the Maintenance Operation Protocol (MOP), use the **mopenabled** command in interface configuration mode. To disable MOP on an interface, use the **no** form of this command.

mop enabled
no mop enabled

Syntax Description

This command has no arguments or keywords.

Command Default

Enabled on Ethernet interfaces and disabled on all other interfaces.

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following example enables MOP for serial interface 0:

```
Router(config)# interface serial 0
Router(config-if)# mop enabled
```

Related Commands

Command	Description
mop retransmit-timer	Configures the length of time that the Cisco IOS software waits before sending boot requests again to a MOP server.
mop retries	Configures the number of times the Cisco IOS software will send boot requests again to a MOP server.
mop sysid	Enables an interface to send out periodic MOP system identification messages.

mop sysid

To enable an interface to send out periodic Maintenance Operation Protocol (MOP) system identification messages, use the **mopsysid** command in interface configuration mode. To disable MOP message support on an interface, use the **no** form of this command.

mop sysid
no mop sysid

Syntax Description	This command has no arguments or keywords.

Command Default Enabled

Command Modes Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines You can still run MOP without having the background system ID messages sent. This command lets you use the MOP remote console, but does not generate messages used by the configurator.

Examples The following example enables serial interface 0 to send MOP system identification messages:

```
Router(config)# interface serial 0
Router(config-if)# mop sysid
```

Related Commands

Command	Description
mop device-code	Identifies the type of device sending MOP sysid messages and request program messages.
mop enabled	Enables an interface to support the MOP.

multicast

To configure mesh multicast mode, use the **multicast** command.

multicast { **in-only** | **in-out** | **regular** }

Syntax Description	**in-only** Configures mesh multicast In Mode.
	in-out Configures mesh multicast In-Out Mode.
	regular Configures mesh multicast Regular Mode.

Command Default   in-out

Command Modes   config-wireless-mesh-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the multicast In Mode for a mesh AP profile:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile mesh mesh-profile
Device(config-wireless-mesh-profile)# multicast in-only
```

multicast vlan

To configure multicast on a single VLAN, use the **multicast vlan** command. To remove the multicast, use the **no** form of the command.

multicast   vlan *vlan-id*
no   multicast   vlan *vlan-id*

Syntax Description	*vlan-id* Specifies the VLAN ID.

Command Default   Disabled.

Command Modes   Wireless policy configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure multicast:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy policy-test
Device(config-wireless-policy)# multicast vlan 12
```

multicast filter

To configure multicast filters, use the **multicast filter** command. To disable the feature, use the **no** form of the command.

multicast filter

Syntax Description	**multicast filter**	Configures multicast filters.

Command Default   None

Command Modes   Wireless policy configuration

Command History

Release	**Modification**
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Example

This example shows how to configure multicast filters:

```
Device(config-wireless-policy)# multicast filter
```

name

To configure the name of the Online Sign-Up (OSU) operator in a given language, use the **name** command. To remove the name of the OSU operator, use the **no** form of the command.

name *operator-name language-code* [*service-description*]

Syntax Description	*operator-name*	OSU operator name.
	language-code	A three character language code for the operator. Use only the first three letters of the language, in lower case, for the language code. For example, use *eng* for English.
		To see the full list of language codes, go to: http://www.loc.gov/standards/iso639-2/php/code_list.php.
	service-description	Service description for the OSU operator.

Command Default	None

Command Modes	ANQP OSU Provider Configuration (config-anqp-osu-provider)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure the name of an OSU operator in a given language:

```
Device(config-wireless-anqp-server)# osu-provider my-osu
Device(config-anqp-osu-provider)# name xxy eng
```

nac

To enable RADIUS Network Admission Control (NAC) support, use the **nac** command. To disable NAC support, use the **no** form of this command.

nac [**ise** | **xwf**]
no nac

Syntax Description	**ise**	Configures Radius NAC support (Identity Service Engine)
	xwf	Configures Express Wi-Fi NAC support.

Command Default NAC is disabled.

Command Modes Wireless policy configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure RADIUS NAC:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy default-policy-profile
Device(config-wireless-policy)# nac
```

nai-realm

To configure the 802.11u Network Access Identifier (NAI) realm, use the **nai-realm** command. To remove the realm, use the **no** form of the command.

nai-realm *nai-realm*

Syntax Description	*nai-realm*	NAI realm name.
		The realm name should not exceed 220 characters.

Command Default   None

Command Modes   Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure the 802.11u NAI realm:

```
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# nai-realm cisco.com
```

nai-realm

To configure the Network Access Identifier (NAI) realm for advice of charge, use the **nai-realm** command. To remove the NAI realm for advice of charge, use the **no** form of this command.

nai-realm *realm-name*

Syntax Description

realm-name	NAI realm name for advice of charge.

Command Default NAI realm is not configured.

Command Modes Wireless ANQP Advice Charge Configuration (config-anqp-advice-charge)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

The following example shows how to configure the NAI realm for advice of charge:

```
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# advice-charge unlimited
Device(config-anqp-advice-charge)# nai-realm cisco
```

nai-realm (OSU Provider)

To configure the Network Access Identifier (NAI) realm of the OSU operator, use the **nai-realm** command. To remove the realm of the OSU operator, use the **no** form of the command.

nai-realm *nai-realm*

Syntax Description

nai-realm	NAI realm name.
	The realm name should not exceed 220 characters.

Command Default   None

Command Modes   ANQP OSU Provider Configuration (config-anqp-osu-provider)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure the NAI realm of the OSU operator:

```
Device(config-anqp-osu-provider)# nai-realm cisco.com
```

nas-id

To configure option parameters for a NAS ID, use the **nas-id** command.

nas-id { **option1** | **option2** | **option3** } { **ap-eth-mac** | **ap-ip** | **ap-location** | **ap-mac** | **ap-name** | **ap-policy-tag** | **ap-site-tag** | **custom-string** *custom-string* | **ssid** | **sys-ip** | **sys-mac** | **sys-name** }

Syntax Description	**ap-eth-mac**	Ethernet MAC address of the AP.
	ap-ip	IP address of the AP.
	ap-location	Location of the AP.
	ap-mac	MAC address of the AP.
	ap-name	Name of the AP.
	ap-policy-tag	Policy tag of the AP.
	ap-site-tag	Site tag of the AP.
	custom-string*custom-string*	Custom string, with various combinations of option1, option2 and option3.
	ssid	SSID.
	sys-ip	IP address of the system.
	sys-mac	MAC address of the system.
	sys-name	Name of the system.

Command Default   None

Command Modes   config-aaa-policy

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.
	Cisco IOS XE Cupertino 17.7.1	This command was modified by adding the following keyword and variable:
		• **custom-string**
		• *custom-string*

Examples

The following example shows how to configure the system IP address for the NAS-ID:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
```

```
Device(config)# wireless aaa policy profile-name
Device(config-aaa-policy)# nas-id option2 sys-ip
```

The following example shows how to configure a custom string for the NAS-ID:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless aaa policy profile-name
Device(config-aaa-policy)# nas-id option2 custom-string test
```

nas-id option2

To configure option 2 parameters for a NAS-ID, use the **nas-id option2** command.

nas-id option2 {**sys-ip** | **sys-name** | **sys-mac** }

Syntax Description	**sys-ip** System IP Address.
	sys-name System Name.
	sys-mac System MAC address.

Command Default None

Command Modes config-aaa-policy

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the system IP address for the NAS-ID:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless aaa policy profile-name
Device(config-aaa-policy)# nas-id option2 sys-ip
```

ndp-mode

To configure the NDP mode for an AP under the RF profile, use the **ndp-mode** command in the RF profile configuration.

ndp-mode { **auto** | **off-channel** }

Syntax Description	**ndp-mode**	Configures operating mode for 802.11a neighbor discovery.
	auto	Enables the auto mode.
	off-channel	Enables NDP packets on RF ASIC radio.

Command Modes   RF profile configuration (config-rf-profile)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Example

The following example shows how to configure the operating mode for 802.11a neighbor discovery:

```
Device# configure terminal
Device(config)# ap dot11 24ghz rf-profile rf-profile-name
Device(config-rf-profile)# ndp-mode auto
```

network

To configure the network number in decimal notation, use the **network** command.

network *network-number* [*network-mask* | **secondary**]

Syntax Description	*ipv4-address*	Network number in dotted-decimal notation.
	network-mask	Network mask or prefix length.
	secondary	Configure as secondary subnet.

Command Default	None

Command Modes	dhcp-config

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure network number and the mask address:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ip dhcp pool name
Device(dhcp-config)# network 209.165.200.224 255.255.255.0
```

network-type

To configure the 802.11u network type, use the **network-type** command. To remove the network type, use the **no** form of the command.

network-type { **chargeable-public**
| **emergency** | **free-public** | **guest-private** | **personal-device** | **private** | **test** | **wildcard** } **internet-access**
{ **allowed** | **forbidden** }

Syntax Description		
	chargeable-public	Sets as chargeable public network.
	emergency	Sets as emergency network.
	free-public	Sets as free public network.
	guest-private	Sets as guest private network.
	personal-device	Sets as personal device network.
	private	Sets as private network.
	test	Sets as test network.
	wildcard	Sets as wildcard network.
	internet-access	Configures network ability to access the internet.
	allowed	Enables internet access.
	disabled	Disables internet access.

Command Default None

Command Modes Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure 802.11u network type:

```
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# network-type wildcard internet-access allowed
```

nmsp cloud-services enable

To configure NMSP cloud services, use the **nmsp cloud-services enable** command.

nmsp cloud-services enable

Command Default	None
Command Modes	Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to enable NMSP cloud services:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# nmsp cloud-services enable
```

nmsp cloud-services http-proxy

To configure the proxy for NMSP cloud server, use the **nmsp cloud-services http-proxy** command.

nmsp cloud-services http-proxy *proxy-server port*

Syntax Description	*proxy-server*	Enter the hostname or the IP address of the proxy server for NMSP cloud services.
	port	Enter the proxy server port number for NMSP cloud services.

Command Default   None

Command Modes   Global configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the proxy for NMSP cloud server:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# nmsp cloud-services http-proxy host-name port-number
```

nmsp cloud-services server token

To configure the NMSP cloud services server parameters, use the **nmsp cloud-services server token** command.

nmsp cloud-services server token *token*

Syntax Description	*token* Authentication token for the NMSP cloud services.

Command Default None

Command Modes config

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the for the NMSP cloud services server parameters:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# nmsp cloud-services server token authentication-token
```

nmsp cloud-services server url

To configure NMSP cloud services server URL, use the **nmsp cloud-services server url** command.

nmsp cloud-services server url *url*

Syntax Description	*url* URL of the NMSP cloud services server.

Command Default None

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure a URL for NMSP cloud services server:

```
Device(config)# nmps cloud-services server url http://www.example.com
```

nmsp notification interval

To modify the Network Mobility Services Protocol (NMSP) notification interval value on the controller to address latency in the network, use the **nmsp notification interval** command in global configuration mode.

nmsp notification interval { **attachment** | **location** | **rssi** {**clients** | **rfid** | **rogues** {**ap** | **client** } } }

Syntax Description		
	attachment	Specifies the time used to aggregate attachment information.
	location	Specifies the time used to aggregate location information.
	rssi	Specifies the time used to aggregate RSSI information.
	clients	Specifies the time interval for clients.
	rfid	Specifies the time interval for rfid tags.
	rogues	Specifies the time interval for rogue APs and rogue clients .
	ap	Specifies the time used to aggregate rogue APs .
	client	Specifies the time used to aggregate rogue clients.

Command Default No default behavior or values.

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to set the NMSP notification interval for the active RFID tags to 25 seconds:

```
Device# configure terminal
Device(config)# nmsp notification-interval rfid 25
Device(config)# end
```

This example shows how to modify NMSP notification intervals for device attachment (connecting to the network or disconnecting from the network) every 10 seconds:

```
Device# configure terminal
Device(config)# nmsp notification-interval attachment 10
Device(config)# end
```

This example shows how to configure NMSP notification intervals for location parameters (location change) every 20 seconds:

```
Device# configure terminal
Device(config)# nmsp notification-interval location 20
Device(config)# end
```

nmsp strong-cipher

To enable the new ciphers, use the **nmsp strong-cipher** command in global configuration mode. To disable, use the **no** form of this command.

nmsp strong-cipher
no nmsp strong-cipher

Syntax Description   This command has no arguments or keywords.

Command Default   The new ciphers are not enabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
15.2(2)E	This command was introduced.

Usage Guidelines   The **nmsp strong-cipher** command enables strong ciphers for new Network Mobility Service Protocol (NMSP) connections.

Note   The existing NMSP connections will use the default cipher.

Examples   The following example shows how to enable a strong-cipher for NMSP:

```
Device> enable
Device> configure terminal
Device(config)# nmsp strong-cipher
```

Related Commands

Command	Description
show nmsp status	Displays the status of active NMSP connections.

no redun-management fast-switchover

To disable explicit fast switchover notification, use the **no redun-management fast-switchover** command.

Note	Configure this in the primary controller. This configuration is not required in the secondary controller.

no redun-management fast-switchover

Syntax Description This command has no arguments or keywords.

Command Default None

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Examples

The following example shows how to disable explicit fast switchover notification:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# no redun-management fast-switchover
```

no redun-management garp-retransmit initial

To disable the initial GARP, use the **no redun-management garp-retransmit initial** command.

no redun-management garp-retransmit initial

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Examples

The following example shows how to disable the initial GARP:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# no redun-management garp-retransmit initial
```

no accounting-interim

To disable Interim accounting, use the **no accounting-interim** command.

no accounting-interim

Syntax Description   This command has no arguments or keywords.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Examples

The following example shows how to disable Interim accounting:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy <default-policy-profile>
Device(config-wireless-policy)# no accounting-interim
```

ntp auth-key

To configure the Network Time Protocol (NTP) server authentication key information on an AP profile, use the **ntp auth-key** command. To remove the NTP server authentication key information from an AP profile, use the **no ntp auth-key** command.

ntp auth-key index *key-index* **type** { **md5** | **sha1** } **format** { **ascii** | **hex** } **key** { **0** | **8** } *server-key*

Syntax Description		
key-index	Key index. Valid range is from 1 to 65535.
md5	Specifies that a Message Digest 5 (MD5) authentication key will follow.
sha1	Specifies that a Secure Hash Algorithm 1 (SHA1) authentication key will follow.
format	Defines the key format—ASCII or HEX..
ascii	Specifies that an ASCII key will follow.
hex	Specifies that a hex key will follow.
key	Defines the NTP server key—unencrypted or encrypted.
0	Specifies that an UNENCRYPTED password will follow.
8	Specifies that an AES encrypted password will follow.
server-key	NTP server key. For ASCII key, ensure that the length is less than 21 bytes. For HEX key, the length should be less than 41, using only numbers between 0-9 and characters from a-f.

Command Default NTP server authentication is not set.

Command Modes AP profile configuration (config-ap-profile)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Examples The following example shows how to configure NTP server authentication key information on an AP profile:

```
Device# configure terminal
Device(config)# ap profile test
Device(config-ap-profile)# ntp ip 198.51.100.5
Device(config-ap-profile)# ntp auth-key index 12 type
md5 format ascii key 0 test
```

office-extend

To enable the OfficeExtend AP mode for a FlexConnect AP, use the **office-extend** command.

office-extend

Command Default	None

Command Modes	config-wireless-flex-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to enable the OfficeExtend AP mode for a FlexConnect AP:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile flex flex-profile-name
Device(config-wireless-flex-profile)# office-extend
```

okc

To enable Opportunistic Key Caching (OKC), if it is not already enabled, use the **okc** command. To disable the feature, use the **no** form of the command.

okc

[no] okc

Syntax Description	**okc**	Enables or disables Opportunistic Key Caching (OKC). OKC is enabled by default.

Command Default None

Command Modes WLAN configuration

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Example

The following example helps to show how OKC is enabled:

```
Device(config-wlan)# okc
```

open-roaming-oi

To set open roaming element alias, use the **open-roaming-oi** command. To remove the open roaming element alias, use the **no** form of the command.

open-roaming-oi *alias*

Syntax Description

| *alias* | Roaming organizational identifier alias. |

Command Default   Roaming organizational identifier alias is not configured.

Command Modes   Wireless ANQP Server Configuration (config-wireless-anqp-server)#

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Example

The following example shows how to set open roaming element alias:

```
Device# configure terminal
Device(config)# wireless hotspot anqp-server my_server
Device(config-wireless-anqp-server)# open-roaming-oi allow-all
```

operator

To configure a Hotspot 2.0 operator-friendly name in a given language, use the **operator** command. To remove the operator name, use the **no** form of the command.

operator *operator-name language-code*

Syntax Description		
	operator-name	Name of the operator.
	language-code	A three character language code for the operator. Use only the first three letters of the language, in lower case, for the language code. For example, use *eng* for English.
		To see the full list of language codes, go to: http://www.loc.gov/standards/iso639-2/php/code_list.php.

Command Default None

Command Modes Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure an operator-friendly name:

```
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# operator XYZ-operator eng
```

operating-class

To configure a Hotspot 2.0 operating class identifier, use the **operating-class** command. To remove the operating class, use the **no** form of the command.

operating-class *class-id*

Syntax Description	*class-id*	Operating class ID number.

Command Default   None

Command Modes   Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure an operating class identifier:

```
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# operating-class 25
```

option

To configure optional data parameters for a flow exporter for , use the **option** command in flow exporter configuration mode. To remove optional data parameters for a flow exporter, use the **no** form of this command.

option {**exporter-stats** | **interface-table** | **sampler-table**} [**timeout** *seconds*]
no option {**exporter-stats** | **interface-table** | **sampler-table**}

Syntax Description		
exporter-stats	Configures the exporter statistics option for flow exporters.
interface-table	Configures the interface table option for flow exporters.
sampler-table	Configures the export sampler table option for flow exporters.
timeout *seconds*	(Optional) Configures the option resend time in seconds for flow exporters. The range is 1 to 86400. The default is 600.

Command Default The timeout is 600 seconds. All other optional data parameters are not configured.

Command Modes Flow exporter configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines The **option exporter-stats** command causes the periodic sending of the exporter statistics, including the number of records, bytes, and packets sent. This command allows the collector to estimate packet loss for the export records it receives. The optional timeout alters the frequency at which the reports are sent.

The **option interface-table** command causes the periodic sending of an options table, which allows the collector to map the interface SNMP indexes provided in the flow records to interface names. The optional timeout can alter the frequency at which the reports are sent.

The **option sampler-table** command causes the periodic sending of an options table, which details the configuration of each sampler and allows the collector to map the sampler ID provided in any flow record to a configuration that it can use to scale up the flow statistics. The optional timeout can alter the frequency at which the reports are sent.

To return this command to its default settings, use the **no option** or **default option** flow exporter configuration command.

The following example shows how to enable the periodic sending of the sampler option table, which allows the collector to map the sampler ID to the sampler type and rate:

```
Device(config)# flow exporter FLOW-EXPORTER-1
Device(config-flow-exporter)# option sampler-table
```

The following example shows how to enable the periodic sending of the exporter statistics, including the number of records, bytes, and packets sent:

```
Device(config)# flow exporter FLOW-EXPORTER-1
Device(config-flow-exporter)# option exporter-stats
```

The following example shows how to enable the periodic sending of an options table, which allows the collector to map the interface SNMP indexes provided in the flow records to interface names:

```
Device(config)# flow exporter FLOW-EXPORTER-1
Device(config-flow-exporter)# option interface-table
```

osu-provider

To configure a Hotspot 2.0 online sign up (OSU) provider, use the **osu-provider** command. Use the **no** form of the command to remove the OSU provider.

osu-provider *provider-name*

Syntax Description	*provider-name*	Name of the OSU provider.

Command Default None

Command Modes Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure an OSU provider:

```
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# osu-provider yyy
```

osu-ssid

To configure the service set Identifier (SSID) for the wireless client to use for online sign-up (OSU), use the **osu-ssid** command. To remove the SSID, use the **no** form of the command.

osu-ssid *ssid*

Syntax Description	*ssid*	Name of the SSID for the wireless client.
		The SSID length can be up to 32 characters.

Command Default   None

Command Modes   Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure the SSID for the wireless client to use during OSU:

```
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# osu-ssid cisco
```

packet-capture

To enable packet capture on the AP profile, use the **packet-capture** command.

packet-capture *profile-name*

Command Default   None

Command Modes   config-ap-profile

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure packet capture on the AP profile:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap profile demo-profile-name
Device(config-ap-profile)# packet capture demo-profile
```

parameter-map type subscriber attribute-to-service

To configure parameter map type and name, use the **parameter-map type subscriber attribute-to-service** command.

parameter-map type subscriber attribute-to-service *parameter-map-name*

Syntax Description	**attribute-to-service** Name the attribute to service.
	parameter-map-name Name of the parameter map. The map name is limited to 33 characters.

Command Default	None
Command Modes	Global configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure parameter map type and name:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# parameter-map type subscriber attribute-to-service parameter-map-name
```

pae

To enable product telemetry collection, use the **pae** command. To disable product telemetry collection, use the **no** form of this command.

pae

no pae

Command Default   Product telemetry is enabled.

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Dublin 17.10.1	This command was introduced.

Examples   The following example shows how to disable product telemetry collection:

```
Device# configure terminal
Device(config)# no pae
```

parameter-map type webauth

To configure the webauth parameter type for a specific parameter map or all the parameter maps, use the **parameter-map type webauth** command.

parameter-map type webauth { *parameter-map-name* | **global** }

Syntax Description

parameter-map-name	Name of the parameter map. The map name is limited to 99 characters.
global	Applies the configuration to all the parameter maps.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the webauth parameter type for a parameter map named *parameter-map1*:

```
Device# configure terminal
Device(config)# parameter-map type webauth parameter-map1
```

password encryption aes

To enable strong (AES) password encryption, use the **password encryption aes** command. To disable this feature, use the **no** form of this command.

password   encryption aes
no password   encryption aes

Syntax Description	**password**	Configures the encryption password (key).
	encryption	Encrypts system passwords.
	aes	Enables stronger (AES) password encryption.

Command Default None

Command Modes Global configuration mode.

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.2s	This command was introduced.

Example

The following example shows how to enable AES password encryption :

```
Device(config)#password encryption aes
```

peer-blocking

To configure peer-to-peer blocking on a WLAN, use the **peer-blocking** command. To disable peer-to-peer blocking, use the **no** form of this command.

peer-blocking {**allow-private-group** | **drop** | **forward-upstream**}
no peer-blocking

Syntax Description	**allow-private-group**	Specifies the device to allow a private group.
		Note The **allow-private-group** peer-to-peer blocking WLAN configuration works only with the Identity PSK (iPSK) WLAN.
	drop	Specifies the device to discard the packets.
	forward-upstream	Specifies the packets to be forwarded on the upstream VLAN. The device next in the hierarchy to the device decides what action to take regarding the packets.
		Note The **forward-upstream** option is not supported for Flex local switching. Traffic is dropped even if this option is configured. Also, peer to peer blocking for local switching SSIDs are available only for the clients on the same AP.

Command Default Peer blocking is disabled.

Command Modes WLAN configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines You must disable the WLAN before using this command. See Related Commands section for more information on how to disable a WLAN.

This example shows how to enable the drop, forward, and private group options for peer-to-peer blocking:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wlan wlan1
Device(config-wlan)# peer-blocking  allow-private-group
Device(config-wlan)# peer-blocking  drop
Device(config-wlan)# peer-blocking forward-upstream
```

This example shows how to disable the drop, forward, and private group options for peer-to-peer blocking:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wlan wlan1
Device(config-wlan)# no peer-blocking  allow-private-group
```

```
Device(config-wlan)# no peer-blocking  drop
Device(config-wlan)# no peer-blocking forward-upstream
```

plan

To configure the plan information for advice of charge, use the **plan** command. To remove the plan information for advice of charge, use the **no** form of this command.

plan {*language-code* | *currency-code* | **info** {**bootflash** | **flash**} *file-name*}

Syntax Description	*filename*	Plan details, such as file name, in the form of bootflash:filename or flash:filename.
	language-code	First three letters of the language code (ISO 639) for this Advice of Charge, in lower case, for example, *eng* for English.
	currency-code	First three letters of the currency code (ISO 4217) for this Advice of Charge, for example, *EUR* for Euros.

Command Default Plan information is not configured.

Command Modes Wireless ANQP Advice Charge Configuration (config-anqp-advice-charge)

Command History	Release	Modification
	Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

The following example shows how to configure the plan information for advice of charge:

```
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# advice-charge unlimited
Device(config-anqp-advice-charge)# plan eng EUR info bootflash:plan-a
```

pmk propagate

To propogate the (PMK) information to other APs in the site, use the **pmk propagate** command.

pmk propagate

Syntax Description   This command has no arguments or keywords.

Command Default   None

Command Modes   config-wireless-flex-profile

Command History

Release	Modification
Cisco IOS XE Cupertino 17.8.1	This command was introduced.

Examples   The following example shows how to propagate the PMK information to the other APs in the site:

```
Device# configure terminal
Device(config)# wireless profile flex test-flex-profile
Device(config-wireless-flex-profile)# pmk propogate
```

no platform sudi cmca3

To disable the SUDI99 migration and revert to certificate mapping as per older release, use the **no platform sudi cmca3** command.

no platform sudi cmca3

Syntax Description	This command has no keywords or arguments.
Command Default	SUDI99 is set as trustpoint.
Command Modes	Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Usage Guidelines   For high-availability (HA) topology, form the HA pair before running the command. Afterwards, save the configuration and reload the controller to disable the SUDI certificate.

Examples   The following example shows how to disable the SUDI99 migration and revert to certificate mapping as per the earlier release:

```
Device# configure terminal
Device(config)# no platform sudi cmca3
```

policy

To configure media stream admission policy, use the **policy** command.

policy {**admit** | **deny**}

Syntax Description

admit	Allows traffic for a media stream group.
deny	Denies traffic for a media stream group.

Command Default None

Command Modes media-stream

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to allow traffic for a media stream group:

```
Device # configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless media-stream group ms-group 224.0.0.0 224.0.0.223
Device(media-stream)# policy admit
```

police

To define a policer for classified traffic, use the **police** command in policy-map class configuration mode. Use the **no** form of this command to remove an existing policer.

police *rate-bps* *burst-byte* [**conform-action transmit**]
no police rate-bps *burst-byte* [**conform-action transmit**]

Syntax Description		
rate-bps	Specify the average traffic rate in bits per second (b/s). The range is 1000000 to 1000000000.
burst-byte	Specify the normal burst size in bytes. The range is 8000 to 1000000.
conform-action transmit	(Optional) When less than the specified rate, specify that the switch transmits the packet.

Command Default	No policers are defined.

Command Modes	Policy-map class configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines A policer defines a maximum permissible rate of transmission, a maximum burst size for transmissions, and an action to take if either maximum is exceeded.

When configuring hierarchical policy maps, you can only use the **police** policy-map command in a secondary interface-level policy map.

The port ASIC device, which controls more than one physical port, supports 256 policers on the switch (255 user-configurable policers plus 1 policer reserved for internal use). The maximum number of configurable policers supported per port is 63. Policers are allocated on demand by the software and are constrained by the hardware and ASIC boundaries. You cannot reserve policers per port. There is no guarantee that a port will be assigned to any policer.

To return to policy-map configuration mode, use the **exit** command. To return to privileged EXEC mode, use the **end** command.

Examples This example shows how to configure a policer that transmits packets if traffic is less than 1 Mb/s average rate with a burst size of 20 KB. There is no packet modification.

```
Device(config)# class-map class1
Device(config-cmap)# exit
Device(config)# policy-map policy1
Device(config-pmap)# class class1
Device(config-pmap-c)# police 1000000 20000 conform-action transmit
Device(config-pmap-c)# exit
```

This example shows how to configure a policer that transmits packets if traffic is less than 1 Mb/s average rate with a burst size of 20 KB. There is no packet modification. This example uses an abbreviated syntax:

```
Device(config)# class-map class1
Device(config-cmap)# exit
Device(config)# policy-map policy1
Device(config-pmap)# class class1
Device(config-pmap-c)# police 1m 20000 conform-action transmit
Device(config-pmap-c)# exit
```

This example shows how to configure a policer, which marks down the DSCP values with the values defined in policed-DSCP map and sends the packet:

```
Device(config)# policy-map policy2
Device(config-pmap)# class class2
Device(config-pmap-c)# police 1000000 20000 exceed-action policed-dscp-transmit
Device(config-pmap-c)# exit
```

You can verify your settings by entering the **show policy-map** privileged EXEC command.

police cir

To set the policing of committed information rate, use the **police cir** command.

police cir *<target bit rate>*

Syntax Description	**police cir**	Polices committed information rate.
	8000-10000000000	Sets the target bit rate at bits per second. The range is between 8000 and 10000000000.

Command Default   None

Command Modes   Policy map class configuration

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Example

This example shows how to set the committed information rate:

```
Device(config-pmap-c)#police cir 8000
```

policy-tag

To map a policy tag to the AP, use the **policy-tag**command.

policy-tag *policy-tag-name*

Syntax Description

policy-tag-name	Name of the policy tag.

Command Default None

Command Modes config-ap-tag

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines The AP will disconnect and rejoin after running this command.

Example

The following example shows how to configure a policy tag:

```
Device(config-ap-tag)# policy-tag policytag1
```

policy-map

To create or modify a policy map that can be attached to multiple physical ports or switch virtual interfaces (SVIs) and to enter policy-map configuration mode, use the **policy-map** command in global configuration mode. Use the **no** form of this command to delete an existing policy map and to return to global configuration mode.

policy-map *policy-map-name*
no policy-map *policy-map-name*

Syntax Description	*policy-map-name* Name of the policy map.

Command Default	No policy maps are defined.

Command Modes	Global configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines After entering the **policy-map** command, you enter policy-map configuration mode, and these configuration commands are available:

- **class**—Defines the classification match criteria for the specified class map.

- **description**—Describes the policy map (up to 200 characters).

- **exit**—Exits policy-map configuration mode and returns you to global configuration mode.

- **no**—Removes a previously defined policy map.

- **sequence-interval**—Enables sequence number capability.

To return to global configuration mode, use the **exit** command. To return to privileged EXEC mode, use the **end** command.

Before configuring policies for classes whose match criteria are defined in a class map, use the **policy-map** command to specify the name of the policy map to be created, added to, or modified. Entering the **policy-map** command also enables the policy-map configuration mode in which you can configure or modify the class policies for that policy map.

You can configure class policies in a policy map only if the classes have match criteria defined for them. To configure the match criteria for a class, use the **class-map** global configuration and **match** class-map configuration commands. You define packet classification on a physical-port basis.

Only one policy map per ingress port is supported. You can apply the same policy map to multiple physical ports.

You can apply a nonhierarchical policy maps to physical ports. A nonhierarchical policy map is the same as the port-based policy maps in the device.

A hierarchical policy map has two levels in the format of a parent-child policy. The parent policy cannot be modified but the child policy (port-child policy) can be modified to suit the QoS configuration.

In VLAN-based QoS, a service policy is applied to an SVI interface.

Note   Not all MQC QoS combinations are supported for wired ports. For information about these restrictions, see chapters "Restrictions for QoS on Wired Targets" in the QoS configuration guide.

Examples

This example shows how to create a policy map called policy1. When attached to the ingress port, it matches all the incoming traffic defined in class1, sets the IP DSCP to 10, and polices the traffic at an average rate of 1 Mb/s and bursts at 20 KB. Traffic less than the profile is sent.

```
Device(config)# policy-map policy1
Device(config-pmap)# class class1
Device(config-pmap-c)# set dscp 10
Device(config-pmap-c)# police 1000000 20000 conform-action transmit
Device(config-pmap-c)# exit
```

This example show you how to configure hierarchical polices:

```
Device# configure terminal
Device(config)# class-map c1
Device(config-cmap)# exit

Device(config)# class-map c2
Device(config-cmap)# exit

Device(config)# policy-map child
Device(config-pmap)# class c1
Device(config-pmap-c)# priority level 1
Device(config-pmap-c)# police rate percent 20 conform-action transmit exceed action drop
Device(config-pmap-c-police)# exit
Device(config-pmap-c)# exit

Device(config-pmap)# class c2
Device(config-pmap-c)# bandwidth 20000
Device(config-pmap-c)# exit

Device(config-pmap)# class class-default
Device(config-pmap-c)# bandwidth 20000
Device(config-pmap-c)# exit
Device(config-pmap)# exit

Device(config)# policy-map parent
Device(config-pmap)# class class-default
Device(config-pmap-c)# shape average 1000000
Device(config-pmap-c)# service-policy child
Deviceconfig-pmap-c)# end
```

This example shows how to delete a policy map:

```
Device(config)# no policy-map policymap2
```

You can verify your settings by entering the **show policy-map** privileged EXEC command.

policy-map

To create or modify a policy map that can be attached to multiple physical ports or switch virtual interfaces (SVIs) and to enter policy-map configuration mode, use the **policy-map** command in global configuration mode. Use the **no** form of this command to delete an existing policy map and to return to global configuration mode.

policy-map *policy-map-name*
no policy-map *policy-map-name*

Syntax Description	*policy-map-name*	Name of the policy map.

Command Default No policy maps are defined.

Command Modes Global configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines After entering the **policy-map** command, you enter policy-map configuration mode, and these configuration commands are available:

- **class**—Defines the classification match criteria for the specified class map.

- **description**—Describes the policy map (up to 200 characters).

- **exit**—Exits policy-map configuration mode and returns you to global configuration mode.

- **no**—Removes a previously defined policy map.

- **sequence-interval**—Enables sequence number capability.

To return to global configuration mode, use the **exit** command. To return to privileged EXEC mode, use the **end** command.

Before configuring policies for classes whose match criteria are defined in a class map, use the **policy-map** command to specify the name of the policy map to be created, added to, or modified. Entering the **policy-map** command also enables the policy-map configuration mode in which you can configure or modify the class policies for that policy map.

You can configure class policies in a policy map only if the classes have match criteria defined for them. To configure the match criteria for a class, use the **class-map** global configuration and **match** class-map configuration commands. You define packet classification on a physical-port basis.

Only one policy map per ingress port is supported. You can apply the same policy map to multiple physical ports.

You can apply a nonhierarchical policy maps to physical ports. A nonhierarchical policy map is the same as the port-based policy maps in the device.

A hierarchical policy map has two levels in the format of a parent-child policy. The parent policy cannot be modified but the child policy (port-child policy) can be modified to suit the QoS configuration.

In VLAN-based QoS, a service policy is applied to an SVI interface.

Note Not all MQC QoS combinations are supported for wired ports. For information about these restrictions, see chapters "Restrictions for QoS on Wired Targets" in the QoS configuration guide.

Examples This example shows how to create a policy map called policy1. When attached to the ingress port, it matches all the incoming traffic defined in class1, sets the IP DSCP to 10, and polices the traffic at an average rate of 1 Mb/s and bursts at 20 KB. Traffic less than the profile is sent.

```
Device(config)# policy-map policy1
Device(config-pmap)# class class1
Device(config-pmap-c)# set dscp 10
Device(config-pmap-c)# police 1000000 20000 conform-action transmit
Device(config-pmap-c)# exit
```

This example show you how to configure hierarchical polices:

```
Device# configure terminal
Device(config)# class-map c1
Device(config-cmap)# exit

Device(config)# class-map c2
Device(config-cmap)# exit

Device(config)# policy-map child
Device(config-pmap)# class c1
Device(config-pmap-c)# priority level 1
Device(config-pmap-c)# police rate percent 20 conform-action transmit exceed action drop
Device(config-pmap-c-police)# exit
Device(config-pmap-c)# exit

Device(config-pmap)# class c2
Device(config-pmap-c)# bandwidth 20000
Device(config-pmap-c)# exit

Device(config-pmap)# class class-default
Device(config-pmap-c)# bandwidth 20000
Device(config-pmap-c)# exit
Device(config-pmap)# exit

Device(config)# policy-map parent
Device(config-pmap)# class class-default
Device(config-pmap-c)# shape average 1000000
Device(config-pmap-c)# service-policy child
Deviceconfig-pmap-c)# end
```

This example shows how to delete a policy map:

```
Device(config)# no policy-map policymap2
```

You can verify your settings by entering the **show policy-map** privileged EXEC command.

port

To configure the port number to use when configuring the custom application, use the **port** command.

port *port-no*

Syntax Description	*port-no*	Port number.

Command Default None

Command Modes config-custom

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the port number to use when configuring the custom application:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ip nbar custom custom-protocol http host host-string
Device(config-custom)# http host hostname
Device(config-custom)# port port-no
```

priority priority-value

To configure media stream priority, use the **priority** *priority-value* command.

priority *priority-value*

Syntax Description	*priority-value*	Media stream priority value. Valid range is 1 to 8, with 1 being lowest priority and 8 being highest priority.

Command Default   None

Command Modes   config-media-stream

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to set the media stream priority value to the highest, that is 8:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless media-stream group my-media-group 224.0.0.0 224.0.0.223
Device(config-media-stream)# priority 8
```

priority-queue

To enable the egress expedite queue on a port, use the **priority-queue** command in interface configuration mode. Use the **no** form of this command to return to the default setting.

priority-queue out
no priority-queue out

Syntax Description	**out** Enable the egress expedite queue.

Command Default	The egress expedite queue is disabled.

Command Modes	Interface configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

When you configure the **priority-queue out** command, the shaped round robin (SRR) weight ratios are affected because there is one fewer queue participating in SRR. This means that *weight1* in the **srr-queue bandwidth shape** or the **srr-queue bandwidth shape** interface configuration command is ignored (not used in the ratio calculation). The expedite queue is a priority queue, and it is serviced until empty before the other queues are serviced.

Follow these guidelines when the expedite queue is enabled or the egress queues are serviced based on their SRR weights:

- If the egress expedite queue is enabled, it overrides the SRR shaped and shared weights for queue 1.
- If the egress expedite queue is disabled and the SRR shaped and shared weights are configured, the shaped mode overrides the shared mode for queue 1, and SRR services this queue in shaped mode.
- If the egress expedite queue is disabled and the SRR shaped weights are not configured, SRR services the queue in shared mode.

Examples

This example shows how to enable the egress expedite queue when the SRR weights are configured. The egress expedite queue overrides the configured SRR weights.

```
Device(config)# interface gigabitethernet1/0/2
Device(config-if)# srr-queue bandwidth shape 25 0 0 0
Device(config-if)# srr-queue bandwidth share 30 20 25 25
Device(config-if)# priority-queue out
```

This example shows how to disable the egress expedite queue after the SRR shaped and shared weights are configured. The shaped mode overrides the shared mode.

```
Device(config)# interface gigabitethernet1/0/2
Device(config-if)# srr-queue bandwidth shape 25 0 0 0
Device(config-if)# srr-queue bandwidth share 30 20 25 25
```

```
Device(config-if)# no priority-queue out
```

You can verify your settings by entering the **show mls qos interface** *interface-id* **queueing** or the **show running-config** privileged EXEC command.

	Command	Description
Related Commands	**show mls qos interface queueing**	Displays the queueing strategy (SRR, priority queueing), the weights corresponding to the queues, and the CoS-to-egress-queue map.
	srr-queue bandwidth shape	Assigns the shaped weights and enables bandwidth shaping on the four egress queues mapped to a port.
	srr-queue bandwidth share	Assigns the shared weights and enables bandwidth sharing on the four egress queues mapped to a port.

priority

To assign priority to a class of traffic belonging to a policy map, use the **priority** command in policy-map class configuration mode. To remove a previously specified priority for a class, use the **no** form of this command.

priority [*Kbps* [*burst -in-bytes*] | **level** *level-value* [*Kbps* [*burst -in-bytes*]] | **percent** *percentage* [*Kb/s* [*burst -in-bytes*]]]

no priority [*Kb/s* [*burst -in-bytes*] | **level** *level value* [*Kb/s* [*burst -in-bytes*]] | **percent** *percentage* [*Kb/s* [*burst -in-bytes*]]]

Syntax Description

Command Default No priority is set.

Command Modes Policy-map class configuration (config-pmap-c)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines The priority command allows you to set up classes based on a variety of criteria (not just User Datagram Ports [UDP] ports) and assign priority to them, and is available for use on serial interfaces and permanent virtual circuits (PVCs). A similar command, the **ip rtp priority** command, allows you to stipulate priority flows based only on UDP port numbers and is not available for PVCs.

The bandwidth and priority commands cannot be used in the same class, within the same policy map. However, these commands can be used together in the same policy map.

Within a policy map, you can give one or more classes priority status. When multiple classes within a single policy map are configured as priority classes, all traffic from these classes is queued to the same, single, priority queue.

When the policy map containing class policy configurations is attached to the interface to stipulate the service policy for that interface, available bandwidth is assessed. If a policy map cannot be attached to a particular interface because of insufficient interface bandwidth, the policy is removed from all interfaces to which it was successfully attached.

Example

The following example shows how to configure the priority of the class in policy map policy1:

```
Device(config)# class-map cm1
Device(config-cmap)#match precedence 2
Device(config-cmap)#exit

Device(config)#class-map cm2
Device(config-cmap)#match dscp 30
Device(config-cmap)#exit

Device(config)# policy-map policy1
Device(config-pmap)# class cm1
Device(config-pmap-c)# priority level 1
Device(config-pmap-c)# police 1m
```

```
Device(config-pmap-c-police)#exit
Device(config-pmap-c)#exit
Device(config-pmap)#exit

Device(config)#policy-map policy1
Device(config-pmap)#class cm2
Device(config-pmap-c)#priority level 2
Device(config-pmap-c)#police 1m
```

profile (prime filter)

To apply an access point (AP) filter priming profile, use the **profile** command. To disable profile, use the **no** form of this command.

profile *profile-name*

no profile *profile-name*

<table>
<tr><td>**Syntax Description**</td><td>*profile-name*</td><td>AP priming profile name.</td></tr>
</table>

Syntax Description	This command has no arguments or keywords.
Command Default	None
Command Modes	AP prime filter configuration (config-ap-pr-filter)

Command History	**Release**	**Modification**
	Cisco IOS XE Cupertino 17.9.2	This command was introduced.

Examples

The following example shows how to apply a priming profile:

```
Device# configure terminal
Device(config)# ap filter name test-filter type priming
Device(config-ap-pr-filter)# profile Prime-FX
```

protocol (IPv6 snooping)

To specify that addresses should be gleaned with Dynamic Host Configuration Protocol (DHCP) or Neighbor Discovery Protocol (NDP), or to associate the protocol with an IPv6 prefix list, use the **protocol** command. To disable address gleaning with DHCP or NDP, use the **no** form of the command.

protocol {**dhcp** | **ndp**}
no protocol {**dhcp** | **ndp**}

Syntax Description		
	dhcp	Specifies that addresses should be gleaned in Dynamic Host Configuration Protocol (DHCP) packets.
	ndp	Specifies that addresses should be gleaned in Neighbor Discovery Protocol (NDP) packets.

Command Default   Snooping and recovery are attempted using both DHCP and NDP.

Command Modes   IPv6 snooping configuration mode

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   If an address does not match the prefix list associated with DHCP or NDP, then control packets will be dropped and recovery of the binding table entry will not be attempted with that protocol.

- Using the **no protocol** {**dhcp** | **ndp**} command indicates that a protocol will not be used for snooping or gleaning.

- If the **no protocol dhcp** command is used, DHCP can still be used for binding table recovery.

- Data glean can recover with DHCP and NDP, though destination guard will only recovery through DHCP.

This example shows how to define an IPv6 snooping policy name as policy1, place the switch in IPv6 snooping policy configuration mode, and configure the port to use DHCP to glean addresses:

```
Device(config)# ipv6 snooping policy policy1
Device(config-ipv6-snooping)# protocol dhcp
```

primary (ap prime)

To configure the primary controller for access point (AP) fallback, use the **primary** command. To remove the primary controller from being used for AP priming, use the **no** form of this command.

primary *controller-name ip-address*

no primary *controller-name ip-address*

Syntax Description		
	controller-name	Name of the primary controller.
	ip-address	IPv4 or IPv6 address of the controller.

Command Default   None

Command Modes   AP prime configuration (config-priming)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.2	This command was introduced.

Examples

The following example shows how to configure the primary controller for AP fallback:

```
Device# configure terminal
Device(config)# wireless profile ap priming Prime-FX
Device(config-priming)# primary aaaa 209.165.201.2
```

priming-override

To override the existing access point (AP) priming configurations, use the **priming-override** command. To disable priming override, use the **no** form of this command.

priming-override

no priming-override

Syntax Description	This command has no arguments or keywords.
Command Default	Priming override is disabled.
Command Modes	AP prime configuration (config-priming)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.2	This command was introduced.

Usage Guidelines

- When priming override is disabled, information stored in the AP priming profile is not sent to the APs.

- N+1 upgrade may not work properly when priming override is enabled. Before using N+1 upgrade, ensure that priming override is disabled using the **no priming-override** command.

Examples

The following example shows how to override the existing AP priming configurations:

```
Device# configure terminal
Device(config)# wireless profile ap priming Prime-FX
Device(config-priming)# priming-override
```

public-ip

To configure the NAT public IP address of the controller, use the **public-ip** command.

public-ip{*ipv4-address* | *ipv6-address*}

Syntax Description		
	ipv4-address	Sets IPv4 address.
	ipv6-address	Sets IPv6 address.

Command Default   None

Command Modes   Management Interface Configuration(config-mgmt-interface)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines

Example

The following example shows how to configure the NAT public IP address of the controller:

```
Device# configure terminal
Device(config)# wireless management interface Vlan1
Device(config-mgmt-interface)# public-ip 192.168.172.100
```

qbss-load

To enable QoS enhanced basic service set (QBSS) IE, use the **qbss-load** command. To disable the feature, use the **no** form of the command.

qbss-load

[no] qbss-load

Syntax Description	**qbss-load**	Enables QoS enhanced basis service set (QBSS) IE.

Command Default   None

Command Modes   Wireless policy configuration

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Example

The following example shows how QBSS-load is configured:

```
Device(config-wireless-policy)#qbss-load
```

qos-map

To configure a quality of service (QoS) map, use the **qos-map** command in ap profile configuration mode.

Use the **no** form of the command to disable the configuration.

qos-map { **action-frame** | **dscp-to-up-exception** *dscp-value user-priority* | **dscp-to-up-range** *user-priority dscp-value lower-dscp-range upper-dscp-range* | **trust-dscp-upstream** }

Syntax Description	**action-frame**	Sends the 802.11 QoS map action frame when the QoS map configuration is changed.
	dscp-to-up-exception	Provides DSCP-to-user priority mapping exception.
	dscp-to-up-range	Provides DSCP-to-user priority mapping.
		To delete all the custom mapping, use the **no dscp-to-up-range** command.
	dscp-value	User priority-to-DSCP upstream. Valid range is from 0-63.
	user-priority	User priority. Valid range is from 1-7.
	lower-dscp-range	Lower-end of the DSCP range. Valid range is from 0-63.
	upper-dscp-range	Upper-end of the DSCP range. Valid range is from 0-63.
	trust-dscp-upstream	Instructs an access point (AP) to trust upstream DSCP instead of user priority.

Command Default None

Command Modes AP Profile Configuration (config-ap-profile)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines For internetworking with IP networks, a mapping is devised between the 802.11e user priorities and IP DSCP.

The mapping is specified as DSCP ranges to individual UP values, and as a set of exceptions with one-to-one mapping between DSCP values and UP values. If the QoS Map is enabled and user configurable mappings are not added, then the default values are used.

You can configure up to eight configuration entries for *user-priority*; one for each *user-priority* value. If you do not configure a custom value, a non-configured value (0xFF) is sent to the corresponding AP and the wireless clients.

For **dscp-to-up-exception**, you can configure a maximum of 21 entries.

The following table shows a QoS map where the corresponding AP provides a wireless client with the required mapping from IP DSCP to 802.11e user priorities.

Table 10: Default DSCP-range to UP Mapping

IP DSCP Range	802.11e User Priority
0-7	0
8-15	1
16-23	2
24-31	3
32-39	4
40-47	5
48-55	6
56-63	7

The following table shows the set of exceptions with one-to-one mapping between DSCP values and user priority values.

Table 11: Default DSCP-range to UP Mapping Exceptions

IP DSCP	802.11e User Priority
0	0
2	1
4	1
6	1
10	2
12	2
14	2
18	3
20	3
22	3
26	4
34	5
46	6
48	7
56	7

Example

The following example shows how to configure a QoS map:

```
Device(config)# ap profile hotspot
Device(config-ap-profile)# qos-map dscp-to-up-range 6 52 23 62
```

qos queue-softmax-multiplier

To increase the value of softmax buffer, use the **qos queue-softmax-multiplier** command in the global configuration mode.

qos queue-softmax-multiplier *range-of-multiplier*
no **qos queue-softmax-multiplier** *range-of-multiplier*

Syntax Description

range-of-multiplier	You can specify a value in the range of 100 to 1200. The default value is 100.

Command Default None

Command Modes Global configuration (config)

Command History

Release	Modification
	This command was introduced.

Usage Guidelines

Note This command would take effect only on the ports where a policy-map is attached. If configured as 1200, the softmax for non-priority queues and non-primary priority queue (!=level 1) are multiplied by 12 with their default values. This command is not applicable for priority queue level 1.

qos video

To configure over-the-air QoS class to video only, use the **qos video** command.

qos video

Command Default   None

Command Modes   config-media-stream

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure over-the-air QoS class to video only:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless media-stream group my-media-group 224.0.0.0 224.0.0.223
Device(config-media-stream)# qos video
```

qos wireless-default untrust

To configure the default trust behavior to untrust wireless packets, use the **qos wireless-default untrust** command. To configure the default trust behavior of wireless traffic to trust, use the **no** form of the command.

qos wireless-default-untrust
no qos wireless-default-untrust

Syntax Description	This command has no arguments or keywords.
Command Default	To check the trust behavior on the device, use the **show running-config**	**sec qos** or the **show run**	**include untrust** command.
Command Modes	Configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

The following command changes the default behavior for trusting wireless traffic to untrust.

```
Device(config)# qos wireless-default-untrust
```

queue-buffers ratio

To configure the queue buffer for the class, use the **queue-buffers ratio** command in policy-map class configuration mode. Use the **no** form of this command to remove the ratio limit.

queue-buffers ratio *ratio limit*
no queue-buffers ratio *ratio limit*

Syntax Description	*ratio limit* (Optional) Configures the queue buffer for the class. Enter the queue buffers ratio limit (0-100).

Command Default	No queue buffer for the class is defined.

Command Modes	Policy-map class configuration (config-pmap-c)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines
Either the **bandwidth**, **shape**, or **priority** command must be used before using this command. For more information about these commands, see *Cisco IOS Quality of Service Solutions Command Reference* available on Cisco.com

The allows you to allocate buffers to queues. If buffers are not allocated, then they are divided equally amongst all queues. You can use the queue-buffer ratio to divide it in a particular ratio. The buffers are soft buffers because Dynamic Threshold and Scaling (DTS) is active on all queues by default.

Example

The following example sets the queue buffers ratio to 10 percent:

```
Device(config)# policy-map policy_queuebuf01
Device(config-pmap)# class-map class_queuebuf01
Device(config-cmap)# exit
Device(config)# policy policy_queuebuf01
Device(config-pmap)# class class_queuebuf01
Device(config-pmap-c)# bandwidth percent 80
Device(config-pmap-c)# queue-buffers ratio 10
Device(config-pmap)# end
```

You can verify your settings by entering the **show policy-map** privileged EXEC command.

queue-limit

To specify or modify the maximum number of packets the queue can hold for a class policy configured in a policy map, use the **queue-limit** policy-map class configuration command. To remove the queue packet limit from a class, use the **no** form of this command.

queue-limit *queue-limit-size* [**packets**] {**cos** *cos-value* | **dscp** *dscp-value*} **percent** *percentage-of-packets*
no queue-limit *queue-limit-size* [**packets**] {**cos** *cos-value* | **dscp** *dscp-value*} **percent**
percentage-of-packets

Syntax Description	*queue-limit-size*	The maximum size of the queue. The maximum varies according to the optional unit of measure keyword specified (bytes, ms, us, or packets).
	cos *cos-value*	Specifies parameters for each cos value. CoS values are from 0 to 7.
	dscp *dscp-value*	Specifies parameters for each DSCP value. You can specify a value in the range 0 to 63 specifying the differentiated services code point value for the type of queue limit .
	percent *percentage-of-packets*	A percentage in the range 1 to 100 specifying the maximum percentage of packets that the queue for this class can accumulate.

Command Default	None

Command Modes	Policy-map class configuration (policy-map-c)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines Although visible in the command line help-strings, the **packets** unit of measure is not supported; use the **percent** unit of measure.

✎

Note   This command is supported only on wired ports in the egress direction.

Weighted fair queuing (WFQ) creates a queue for every class for which a class map is defined. Packets satisfying the match criteria for a class accumulate in the queue reserved for the class until they are sent, which occurs when the queue is serviced by the fair queuing process. When the maximum packet threshold you defined for the class is reached, queuing of any further packets to the class queue causes tail drop.

You use queue limits to configure Weighted Tail Drop (WTD). WTD ensures the configuration of more than one threshold per queue. Each class of service is dropped at a different threshold value to provide for QoS differentiation.

You can configure the maximum queue thresholds for the different subclasses of traffic, that is, DSCP and CoS and configure the maximum queue thresholds for each subclass.

Example

The following example configures a policy map called port-queue to contain policy for a class called dscp-1. The policy for this class is set so that the queue reserved for it has a maximum packet limit of 20 percent:

```
Device(config)# policy-map policy11
Device(config-pmap)# class dscp-1
Device(config-pmap-c)# bandwidth percent 20
Device(config-pmap-c)# queue-limit dscp 1 percent 20
```

queue-set

To map a port to a queue set, use the **queue-set** command in interface configuration mode. Use the **no** form of this command to return to the default setting.

queue-set *qset-id*
no queue-set *qset-id*

Syntax Description	*qset-id* Queue-set ID. Each port belongs to a queue set, which defines all the characteristics of the four egress queues per port. The range is 1 to 2.

Command Default	The queue set ID is 1.

Command Modes	Interface configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples

This example shows how to map a port to queue-set 2:

```
Device(config)# interface gigabitethernet2/0/1
Device(config-if)# queue-set 2
```

You can verify your settings by entering the **show mls qos interface** [*interface-id*] **buffers** privileged EXEC command.

Related Commands	**Command**	**Description**
	mls qos queue-set output buffers	Allocates buffers to a queue set.
	mls qos queue-set output threshold	Configures the weighted tail-drop (WTD) thresholds, guarantees the availability of buffers, and configures the maximum memory allocation to a queue set.

radio policy dot11 5ghz slot

To configure a WLAN radio policy on a specific 5-GHz slot, use the **radio policy dot11 5ghz slot** command.

radio policy dot11 5ghz slot *slot_id*

Syntax Description		
	0	Configures the WLAN on 5-GHz radio with radio slot 0.
	1	Configures the WLAN on 5-GHz radio with radio slot 1.
	2	Configures the WLAN on 5-GHz radio with radio slot 2 (if present).
	Note	You will be able to configure WLAN on the specified 5 GHz radiof slot only.

Command Default

Radio policy is enabled on all the bands.

Command Modes

WLAN configuration

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines

You can choose a specific radio and a slot to broadcast the WLAN. This option is only available on a 5GHz radio.

Examples

This example shows how to configure a radio policy on a specific WLAN slot:

```
Device# configure terminal
Device(config)#wlan test4
Device(config-wlan)# radio policy dot11 5ghz
Device(config-wlan-radio-5ghz)# slot 1
Device(config-wlan)# end
```

radius server

To configure the RADIUS server, use the **radius server** command in global configuration mode.

radius server *server-name*

Syntax Description

server-name	RADIUS server name.

Command Default None

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines None

The following example shows how to configure a radius server:

```
Device(config)# radius server ISE
```

radius-server deadtime

To improve RADIUS response times when some servers might be unavailable, use the **radius-server deadtime** command to cause the unavailable servers to be skipped immediately. To set dead-time to the default value of 0, use the **no** form of this command.

radius-server deadtime *time-in-minutes*

no radius-server deadtime

Syntax Description	*time-in-minutes*	Length of time, in minutes, for which a RADIUS server is skipped over by transaction requests, up to a maximum of 1440 minutes (24 hours).

Command Default	Dead time is set to 0.

Command Modes	Global configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines Use this command to mark as "dead" any RADIUS servers that fail to respond to authentication requests, thus avoiding the wait for the request to time out before trying the next configured server. A RADIUS server marked as "dead" is skipped by additional requests for the duration of minutes or unless there are no servers not marked "dead."

Example

The following example shows how to set deadtime for RADIUS servers that fail to respond to authentication requests:

```
Device(config)# radius-server deadtime 5
```

radius-server attribute wireless accounting call-station-id

To configure call station identifier sent in the RADIUS accounting messages, use the **radius-server attribute wireless accounting call-station-id** command. To remove the call station identifier from the radius accounting messages, use the **no** form of the command.

radius-server attribute wireless authentication call-station-id { **ap-ethmac-only** | **ap-ethmac-ssid** | **ap-ethmac-ssid-flexprofilename** | **ap-ethmac-ssid-policytagname** | **ap-ethmac-ssid-sitetagname** | **ap-group-name** | **ap-label-address** | **ap-label-address-ssid** | **ap-location** | **ap-macaddress** | **ap-macaddress-ssid** | **ap-macaddress-ssid-flexprofilename** | **ap-macaddress-ssid-policytagname** | **ap-macaddress-ssid-sitetagname** | **ap-name** | **ap-name-ssid** | **flex-profile-name** | **ipaddress** | **macaddress** | **policy-tag-name** | **site-tag-name** | **vlan-id** }

Syntax Description		
ap-ethmac-only	Sets the call station identifier type to be AP's radio MAC address.
ap-ethmac-ssid	Sets the call station identifier type AP's radio MAC address with SSID.
ap-ethmac-ssid-flexprofilename	Sets the call station identifier type AP's radio MAC address with SSID and flex profile name.
ap-ethmac-ssid-policytagname	Sets the call station identifier type AP's radio MAC address with SSID and policy tag name.
ap-ethmac-ssid-sitetagname	Sets the call station identifier type AP's radio MAC address with SSID and site tag name.
ap-group-name	Sets the call station identifier type to use the AP group name.
ap-label-address	Sets the call station identifier type to the AP's radio MAC address that is printed on the AP label.
ap-label-address-ssid	Sets the call station identifier type to the AP's radio MAC address and SSID that is printed on the AP label.
ap-location	Sets the call station identifier type to the AP location.
ap-macaddress	Sets the call station identifier type to the AP's radio MAC address.
ap-macaddress-ssid	Sets the call station identifier type to the AP's radio MAC address with SSID.
ap-macaddress-ssid-flexprofilename	Sets the call station identifier type to the AP's radio MAC address with SSID and flex profile name.
ap-macaddress-ssid-policytagname	Sets the call station identifier type to the AP's radio MAC address with SSID and policy tag name.
ap-macaddress-ssid-sitetagname	Sets the call station identifier type to the AP's radio MAC address with SSID and site tag name.
ap-name	Sets the call station identifier type to the AP name.

ap-name-ssid	Sets the call station identifier type to the AP name with SSID.
flex-profile-name	Sets the call station identifier type to the flex profile name.
ipaddress	Sets the call station identifier type to the IP address of the system.
macaddress	Sets the call station identifier type to the MAC address of the system.
policy-tag-name	Sets the call station identifier type to the policy tag name.
site-tag-name	Sets the call station identifier type to the site tag name.
vlan-id	Sets the call station identifier type to the system's VLAN ID.

Command Default Call station identifier is not configured.

Command Modes Global Configuration(config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.
Cisco IOS XE Bengaluru 17.4.1	This command was modified. The **policy-tag-name**, **flex-profile-name**, **ap-macaddress-ssid-flexprofilename**, **ap-macaddress-ssid-policytagname**, **ap-macaddress-ssid-sitetagname**, **ap-ethmac-ssid-flexprofilename**, **ap-ethmac-ssid-policytagname**, and **ap-ethmac-ssid-sitetagname** keywords were introduced.

Usage Guidelines

Example

The following example shows how to configure a call station identifier sent in the RADIUS accounting messages:

```
Device(config)# radius-server attribute wireless accounting call-station-id site-tag-name
```

radius-server attribute wireless authentication call-station-id

To configure call station identifier sent in the RADIUS authentication messages, use the **radius-server attribute wireless authentication call-station-id** command. To remove the call station identifier from the radius accounting messages, use the **no** form of the command.

radius-server attribute wireless authentication call-station-id { **ap-ethmac-only** | **ap-ethmac-ssid** | **ap-ethmac-ssid-flexprofilename** | **ap-ethmac-ssid-policytagname** | **ap-ethmac-ssid-sitetagname** | **ap-group-name** | **ap-label-address** | **ap-label-address-ssid** | **ap-location** | **ap-macaddress** | **ap-macaddress-ssid** | **ap-macaddress-ssid-flexprofilename** | **ap-macaddress-ssid-policytagname** | **ap-macaddress-ssid-sitetagname** | **ap-name** | **ap-name-ssid** | **flex-profile-name** | **ipaddress** | **macaddress** | **policy-tag-name** | **site-tag-name** | **vlan-id** }

Syntax Description

ap-ethmac-only	Sets the call station identifier type to be AP's radio MAC address.
ap-ethmac-ssid	Sets the call station identifier type AP's radio MAC address with SSID.
ap-ethmac-ssid-flexprofilename	Sets the call station identifier type AP's radio MAC address with SSID and flex profile name.
ap-ethmac-ssid-policytagname	Sets the call station identifier type AP's radio MAC address with SSID and policy tag name.
ap-ethmac-ssid-sitetagname	Sets the call station identifier type AP's radio MAC address with SSID and site tag name.
ap-group-name	Sets the call station identifier type to use the AP group name.
ap-label-address	Sets the call station identifier type to the AP's radio MAC address that is printed on the AP label.
ap-label-address-ssid	Sets the call station identifier type to the AP's radio MAC address and SSID that is printed on the AP label.
ap-location	Sets the call station identifier type to the AP location.
ap-macaddress	Sets the call station identifier type to the AP's radio MAC address.
ap-macaddress-ssid	Sets the call station identifier type to the AP's radio MAC address with SSID.
ap-macaddress-ssid-flexprofilename	Sets the call station identifier type to the AP's radio MAC address with SSID and flex profile name.
ap-macaddress-ssid-policytagname	Sets the call station identifier type to the AP's radio MAC address with SSID and policy tag name.
ap-macaddress-ssid-sitetagname	Sets the call station identifier type to the AP's radio MAC address with SSID and site tag name.
ap-name	Sets the call station identifier type to the AP name.

ap-name-ssid	Sets the call station identifier type to the AP name with SSID.
flex-profile-name	Sets the call station identifier type to the flex profile name.
ipaddress	Sets the call station identifier type to the IP address of the system.
macaddress	Sets the call station identifier type to the MAC address of the system.
policy-tag-name	Sets the call station identifier type to the policy tag name.
site-tag-name	Sets the call station identifier type to the site tag name.
vlan-id	Sets the call station identifier type to the system's VLAN ID.

Command Default   Call station identifier is not configured.

Command Modes   Global Configuration(config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.
Cisco IOS XE Bengaluru 17.4.1	This command was modified. The **policy-tag-name**, **flex-profile-name**, **ap-macaddress-ssid-flexprofilename**, **ap-macaddress-ssid-policytagname**, **ap-macaddress-ssid-sitetagname**, **ap-ethmac-ssid-flexprofilename**, **ap-ethmac-ssid-policytagname**, and **ap-ethmac-ssid-sitetagname** keywords were introduced.

Usage Guidelines

Example

The following example shows how to configure a call station identifier sent in the RADIUS authentication messages:

```
Device(config)# radius-server attribute wireless authentication call-station-id site-tag-name
```

range

To configure range from MAP to RAP bridge, use the **range** command.

range *range-in-feet*

Syntax Description	*range-in-feet* Configure the range value in terms of feet. Valid range is from 150 feet to 132000 feet.

Command Default	1200

Command Modes	config-wireless-mesh-profile

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure range from MAP to RAP bridge for a mesh AP profile:

```
Device # configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device (config)# wireless profile mesh mesh-profile
Device (config-wireless-mesh-profile)# range 300
```

reanchor class

To configure classmap with protocols for the selective reanchoring feature, use the **reanchor class** command.

reanchor class *class-name*

Syntax Description	*class-name*	AVC reanchor class name.

Command Default None

Command Modes config-wireless-policy

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure an AVC reanchor classname:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy default-policy-profile
Device(config-wireless-policy)# reanchor class AVC-Reanchor-Class
```

record wireless avc basic

To apply the *wireless avc basic* AVC flow record to a flow monitor, use the **record wireless avc basic** command.

record wireless avc basic

Command Default	None
Command Modes	config-flow-monitor

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines

This command specifies the basic wireless AVC template. When you are configuring AVC, you will need to create a flow monitor using the **record wireless avc basic** command.

Examples

The following example shows how to apply the *wireless avc basic* AVC flow record to a flow monitor named *test-flow*:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# flow monitor test-flow
Device(config-flow-monitor)# record wireless avc basic
```

redundancy revertive

To set redundancy model as revertive, use the **redundancy revertive** command.

redundancy revertive

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   EoGRE domain configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to set redundancy model as revertive:

```
Device(config-eogre-domain)# redundancy revertive
```

redun-management interface Vlan

To configure Redundancy Management Interface (RMI), use the **redun-management interface Vlan** command.

redun-management interface Vlan *vlan-interface-no* **chassis** *chassis-number* **address** *ip-address* **chassis** *chassis-number* **address** *ip-address*

Syntax Description		
vlan-interface-no	Is the VLAN interface number. The valid range is from 1 to 4094.	
	Note	Here, the *vlan-interface-no* is the same VLAN as the Management VLAN. That is, both must be on the same subnet.
chassis-number	Is the chassis number. The valid range is from 1 to 2.	
ip-address	Are the RMI IPs.	

Command Default None

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced.

This example shows how to configure Redundancy Management Interface (RMI):

```
Device# chassis redundancy ha-interface GigabitEthernet 3
Device# configure terminal
Device(config)# redun-management interface Vlan 200 chassis 1 address 9.10.90.147 chassis
2 address
9.10.90.149
Device(config)# end
```

redun-management garp-retransmit

To determine the rate at which the GARP resend is performed, use the **redun-management garp-retransmit** command.

redun-management garp-retransmit burst *packet-burst-size* **interval** *time-interval*

Syntax Description	*packet-burst-size*	The valid range is from 0 to 1000. The value 0 refers to the disabled retransmit.
	time-interval	Refers to the time interval in seconds. The valid range is from 0 to 5 seconds. The value 0 refers to the disabled retransmit.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Examples

The following example shows how to determine the rate at which the GARP resend is performed:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# redun-management garp-retransmit burst packet-burst-size interval
time-interval
```

redirect

To configure a redirect to an external portal, use the **redirect** command.

redirect {**for-login** | **on-failure** | **on-success** }*redirect-url-name*

Syntax Description	**for-login**	To login, redirect to this URL.
	on-failure	If login fails, redirect to this URL.
	on-success	If login is sucessful, redirect to this URL.
	redirect-url-name	Redirect URL name.

Command Default	None

Command Modes	config-params-parameter-map

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure an redirect to an external IPv4 URL to login:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# parameter-map type webauth parameter-name
Device(config-params-parameter-map)# redirect for-login cisco.com
```

redirect portal

To configure external IPv4 or IPv6 portal, use the **redirect portal** command.

redirect portal {**ipv4** | **ipv6** }*ip-addr*

Syntax Description	**ipv4**	IPv4 portal address
	ipv6	IPv6 portal address

Command Default	None

Command Modes	config-params-parameter-map

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure an external IPv4 portal address:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# parameter-map type webauth parameter-name
Device(config-params-parameter-map)# redirect portal ipv4 192.168.1.100
```

remote-span

To configure a VLAN as a Remote Switched Port Analyzer (RSPAN) VLAN, use the **remote-span** command in VLAN configuration mode on the switch stack or on a standalone switch. To remove the RSPAN designation from the VLAN, use the **no** form of this command.

remote-span
no   remote-span

Syntax Description	This command has no arguments or keywords.
Command Default	No RSPAN VLANs are defined.
Command Modes	VLAN configuration (config-VLAN)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

If VLAN Trunking Protocol (VTP) is enabled, the RSPAN feature is propagated by VTP for VLAN IDs that are lower than 1005. If the RSPAN VLAN ID is in the extended range, you must manually configure intermediate switches (those in the RSPAN VLAN between the source switch and the destination switch).

Before you configure the RSPAN **remote-span** command, use the **vlan** (global configuration) command to create the VLAN.

The RSPAN VLAN has these characteristics:

  • No MAC address learning occurs on it.

  • RSPAN VLAN traffic flows only on trunk ports.

  • Spanning Tree Protocol (STP) can run in the RSPAN VLAN, but it does not run on RSPAN destination ports.

When an existing VLAN is configured as an RSPAN VLAN, the VLAN is first deleted and then recreated as an RSPAN VLAN. Any access ports are made inactive until the RSPAN feature is disabled.

This example shows how to configure a VLAN as an RSPAN VLAN:

```
Device(config)# vlan 901
Device(config-vlan)# remote-span
```

This example shows how to remove the RSPAN feature from a VLAN:

```
Device(config)# vlan 901
Device(config-vlan)# no remote-span
```

You can verify your settings by entering the **show vlan remote-span** user EXEC command.

remote-lan

To map an RLAN policy profile to an RLAN profile, use the **remote-lan** command.

remote-lan *remote-lan-profile-name* **policy** *rlan-policy-profile-name* **port-id** *port-id*

Syntax Description	*remote-lan-profile-name*	Remote LAN profile name.
	rlan-policy-profile-name	Remote LAN policy profile name.
	port-id	Port ID.

Command Default	None

Command Modes	Global configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

This example shows how to map an RLAN policy profile to an RLAN profile:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless tag policy remote-lan-policy-tag
Device(config-policy-tag)# remote-lan rlan_profile_name policy rlan_policy_profile port-id
 2
Device(config-policy-tag)# end
```

remote-lan rlan-profile policy rlan-policy ext-module

To configure the remote LAN profile and policy mapping to external module, use the **remote-lan** *rlan-profile* **policy** *rlan-policy***ext-module** command. To disable the remote LAN profile and policy mapping to external module, use the **no** form of the command.

remote-lan *rlan-profile* **policy** *rlan-policy***ext-module**

Syntax Description	

rlan-profile	Configures the RLAN profile for the external module
rlan-policy	Configures the RLAN policy for the external module

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 17.3.1	This command was introduced.

Example

The following example shows how to configure the remote LAN profile and policy mapping to external module under a policy tag:

```
Device(config)# wireless tag policy default-policy-tag
Device(config-policy-tag)# remote-lan <rlan-profile> policy <rlan-policy> ext-module
```

resilient

To enable the Flex Resilient feature in Flex+Bridge mode APs, use the **resilient** command.

resilient

Syntax Description

This command has no keywords or arguments.

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.3.1	This command was introduced.

Usage Guidelines

This example shows how to enable the Flex Resilient feature in Flex+Bridge mode APs:

```
Device# configure terminal
Device(config)# wireless profile flex new-flex-profile
Device(config-wireless-flex-profile)# arp-caching
Device(config-wireless-flex-profile)# description "new flex profile"
Device(config-wireless-flex-profile)# native-vlan-id 2660
Device(config-wireless-flex-profile)# resilient
Device(config-wireless-flex-profile)# vlan-name VLAN2659
Device(config-wireless-flex-profile)# vlan-id 2659
Device(config-wireless-flex-profile)# end
```

rf tag

To configure an RF tag to the AP, use the **rf tag** command.

rf tag *rf-tag-name*

Syntax Description	*rf-tag-name* RF tag name.

Command Default	None
Command Modes	config-ap-tag

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The AP will disconnect and rejoin after running this command.

Example

The following example shows how to configure an RF tag:

```
Device(config-ap-tag)# rf-tag rftag1
```

roaming-oi

To configure a 802.11u roaming organization identifier, use the **roaming-oi** command. To remove the roaming organization identifier, use the **no** form of the command.

roaming-oi *OI-value* [**beacon**]

Syntax Description	*OI-value*	Roaming organization identifier value.
	beacon	Advertises the roaming organization identifier as part of the BSSID beacon.

Command Default   None

Command Modes   Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines   You can configure up to 255 different OI values.

You can use a maximum of three beacons for roaming OIs.

If beacon is specified, the roaming OUI is advertised in the AP WLAN beacon or probe response, else it will only be returned while doing the roaming OUI ANQP query.

Example

The following example shows how to configure an operating class identifier:

```
Device(config)#wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# roaming-oi 24 beacon
```

rrc-evaluation

To configure Resource Reservation Control (RRC) reevaluation admission, use the **rrc-evaluation** command.

rrc-evaluation   {**initial** | **periodic**}

initial	Configures initial admission evaluation.
periodic	Configures periodic admission evaluation.

Syntax Description appears to the left of the above table.

Command Default None

Command Modes config-media-stream

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the RRC reevaluation admission to initial admission evaluation.

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless media-stream group my-media-group 224.0.0.0 224.0.0.223
Device(config-media-stream)# rrc-evaluation initial
```

sampling

To configure the data sampling interval in the AP sensor environment, use the **sampling** command. Use the **no** form of this command to set the data sampling interval to the default time of 5 seconds.

sampling *data-sampling-interval*

no sampling *data-sampling-interval*

Syntax Description	*data-sampling-interval*	Configures the data sampling interval.
		The valid range is between 5 seconds and 3600 seconds. The default value is 5 seconds.

Command Default	None

Command Modes	AP sensor configuration mode

Command History	**Release**	**Modification**
	Cisco IOS XE Cupertino 17.8.1	This command was introduced.

Example

The following example shows you how to configure the data sampling interval in the AP sensor environment:

```
Device(config)# ap profile ap-profile-name
Device(config-ap-profile)# sensor environment air-quality
Device(config-ap-sensor)# sampling 300
```

scheduler asr

To enable advanced scheduling request feature on a WLAN, use the **scheduler asr** command. To disable the advanced scheduling request feature on a WLAN, use the **no** form of the command.

scheduler asr

no scheduler asr

Syntax Description	This command has no keywords or arguments.

Command Default   Advanced scheduling request feature is enabled.

Command Modes   WLAN configuration (config-wlan)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.4.1	This command was introduced

Example

The following example shows how to configure the Advanced Scheduling Request feature on a WLAN:

```
Device# configure terminal
Device(config)# wlan test4
Device(config-wlan)# scheduler asr
```

secondary (ap prime)

To configure a secondary controller for access point (AP) fallback, use the **secondary** command. To remove the secondary controller from being used for AP priming, use the **no** form of this command.

secondary *controller-name* *ip-address*

no secondary *controller-name* *ip-address*

Syntax Description		
	controller-name	Name of the secondary controller.
	ip-address	IPv4 or IPv6 address of the controller.

Command Default None

Command Modes AP prime configuration (config-priming)

Command History	Release	Modification
	Cisco IOS XE Cupertino 17.9.2	This command was introduced.

Examples The following example shows how to configure a secondary controller for AP fallback:

```
Device# configure terminal
Device(config)# wireless profile ap priming Prime-FX
Device(config-priming)# secondary bbbb 209.165.201.3
```

secure-webauth-disable

To disable the HTTP secure server for web authentication, use the **secure-webauth-disable** command in the global parameter-map mode. Use the **no** form of the command to negate the command.

secure-webauth-disable

no secure-webauth-disable

Syntax Description	This command has no keywords or arguments.

Command Default   no secure-webauth-disable

Command Modes   Global parameter-map mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

This example shows how to disable the HTTP secure server for web authentication:

```
Device(config-params-parameter-map)# secure-weauth-disable
```

security

To configure mesh security, use the **security** command.

security { **eap** | **psk** }

Syntax Description	**eap** Configure mesh security EAP for Mesh AP.
	psk Configure mesh security PSK for Mesh AP

Command Default	EAP

Command Modes	config-wireless-mesh-profile

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure mesh security with EAP protcol on an Mesh AP:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile mesh profile-name
Device(config-wireless-mesh-profile)# security eap
```

security dot1x authentication-list

To configure security authentication list for IEEE 802.1x, use the **security dot1x authentication-list** *auth-list-name* command.

security dot1x authentication-list *auth-list-name*

Syntax Description	Parameter	Description
	auth-list-name	Authentication list name.

Command Default	None

Command Modes	config-wlan

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure security authentication list for IEEE 802.1x:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wlan wlan-name
Device(config-wlan)# security dot1x authentication-list auth-list-realm
```

security dot1x request

To configure EAP request related parameters, use the **security dot1x request** command. To reset the EAP request related parameters, use the **no** form of this command.

security dot1x request { **retries** *retry-num* | **timeout** *timeout-value* }

no security dot1x request { **retries** *retry-num* | **timeout** *timeout-value* }

Syntax Description	**retries** *retries*	For EAP messages, specifies the maximum number of times that the controller retransmits the message to a wireless client.
		Valid values range from 0 to 20.
	timeout *timeout-value*	For EAP messages, specifies the amount of time that the controller waits before retransmitting the message to a wireless client.
		Valid values range from 1 to 120.

Command Default	None

Command Modes	Remote LAN Configuration (config-remote-lan)

Command History	**Release**	**Modification**
		This command was introduced.

This example lists all the commands under **wireless security dot1x** .

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap remote-lan profile-name rlan_profile_name 3
Device(config-remote-lan)# security dot1x request retries 10
Device(config-remote-lan)# security dot1x request timeout 100
```

security dot1x identity-request

To configure EAP ID request related parameters, use the **security dot1x identity-request** command. To reset the EAP ID request related parameters, use the **no** form of this command.

security dot1x identity-request { **retries** *retry-num* | **timeout** *timeout-value* }

no security dot1x identity-request { **retries** *retry-num* | **timeout** *timeout-value* }

Syntax Description	**retries** *retries*	For EAP ID requests, specifies the maximum number of times that the controller retransmits the requests.
		Valid values range from 1 to 20.
	timeout *timeout-value*	For EAP ID requests, specifies the amount of time that the controller waits before retransmitting the message.
		Valid values range from 1 to 120.

Command Default   None

Command Modes   Remote LAN Configuration (config-remote-lan)

Command History	**Release**	**Modification**
		This command was introduced.

Examples   The following example shows how to configure EAP ID request related parameters:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap remote-lan profile-name rlan_profile_name 3
Device(config-remote-lan)# security dot1x identity-request retries 10
Device(config-remote-lan)# security dot1x identity-request timeout 100
```

security ft

To configure 802.11r fast transition parameters, use the **security ft** command. To configure fast transition **over the air**, use the **no security ft over-the-ds** command.

security ft [**over-the-ds** | **reassociation-timeout** *timeout-jn-seconds*]
no security ft [**over-the-ds** | **reassociation-timeout**]

Syntax Description	**over-the-ds**	(Optional) Specifies that the 802.11r fast transition occurs over a distributed system. The no form of the command with this parameter configures security ft over the air.
	reassociation-timeout	(Optional) Configures the reassociation timeout interval.
	timeout-in-seconds	(Optional) Specifies the reassociation timeout interval in seconds. The valid range is between 1 to 100. The default value is 20.

Command Default | The feature is disabled.

Command Modes | WLAN configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines | None

WLAN Security must be enabled.

Example

The following example configures security FT configuration for an open WLAN:

```
Device#wlan test
Device(config-wlan)# client vlan 0140
Device(config-wlan)# no mobility anchor sticky
Device(config-wlan)# no security wpa
Device(config-wlan)# no security wpa akm dot1x
Device(config-wlan)# no security wpa wpa2
Device(config-wlan)# no security wpa wpa2 ciphers aes
Device(config-wlan)# security ft
Device(config-wlan)# shutdown
```

The following example shows a sample security FT on a WPA-enabled WLAN:

```
Device# wlan test
Device(config-wlan)# client vlan 0140
Device(config-wlan)# no security wpa akm dot1x
Device(config-wlan)# security wpa akm ft psk
Device(config-wlan)# security wpa akm psk set-key ascii 0 test-test
```

```
Device(config-wlan)# security ft
Device(config-wlan)# no shutdown
```

security level (IPv6 snooping)

To specify the level of security enforced, use the **security-level** command in IPv6 snooping policy configuration mode.

security level { **glean** | **guard** | **inspect** }

Syntax Description		
	glean	Extracts addresses from the messages and installs them into the binding table without performing any verification.
	guard	Performs both glean and inspect. Additionally, RA and DHCP server messages are rejected unless they are received on a trusted port or another policy authorizes them.
	inspect	Validates messages for consistency and conformance; in particular, address ownership is enforced. Invalid messages are dropped.

Command Default   The default security level is guard.

Command Modes   IPv6 snooping configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to define an IPv6 snooping policy name as policy1, place the device in IPv6 snooping configuration mode, and configure the security level as inspect:

```
Device(config)# ipv6 snooping policy policy1
Device(config-ipv6-snooping)# security-level inspect
```

security pmf

To configure 802.11w Management Frame Protection (PMF) on a WLAN, use the **security   pmf** command. To disable management frame protection, use the **no** form of the command.

security pmf {**association-comeback** *association-comeback-time-seconds* | **mandatory** | **optional** | **saquery-retry-time** *saquery-retry-time-milliseconds*}
no security pmf [**association-comeback** *association-comeback-time-seconds* | **mandatory** | **optional** | **saquery-retry-time** *saquery-retry-time-milliseconds*]

Syntax Description		
association-comeback	Configures the 802.11w association comeback time.
association-comeback-time-seconds	Association comeback interval in seconds. Time interval that an associated client must wait before the association is tried again after it is denied with a status code 30. The status code 30 message is "Association request rejected temporarily; Try again later."
	The range is from 1 through 20 seconds.
mandatory	Specifies that clients are required to negotiate 802.1w PMF protection on the WLAN.
optional	Specifies that the WLAN does not mandate 802.11w support on clients. Clients with no 802.11w capability can also join.
saquery-retry-time	Time interval identified before which the SA query response is expected. If the device does not get a response, another SA query is tried.
saquery-retry-time-milliseconds	The saquery retry time in milliseconds. The range is from 100 to 500 ms. The value must be specified in multiples of 100 milliseconds.

Command Default   PMF is disabled.

Command Modes   WLAN configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   You must have WPA (Wi-Fi Protected Access) and AKM (Authentication Key Management) configured to use this feature. See Related Command section for more information on configuring the security parameters.

802.11w introduces an Integrity Group Temporal Key (IGTK) that is used to protect broadcast or multicast robust management frames. IGTK is a random value, assigned by the authenticator station (device) used to protect MAC management protocol data units (MMPDUs) from the source STA. The 802.11w IGTK key is

derived using the four-way handshake and is used only on WLANs that are configured with WPA2 security at Layer 2.

This example shows how to enable the association comeback value at 15 seconds.

```
Device(config-wlan)# security pmf association-comeback 15
```

This example shows how to configure mandatory 802.11w MPF protection for clients on a WLAN:

```
Device(config-wlan)# security pmf mandatory
```

This example shows how to configure optional 802.11w MPF protection for clients on a WLAN:

```
Device(config-wlan)# security pmf optional
```

This example shows how to configure the saquery parameter:

```
Device(config-wlan)# security pmf saquery-retry-time 100
```

This example shows how to disable the PMF feature:

```
Device(config-wlan)# no security pmf
```

security static-wep-key

To configure static WEP keys on a WLAN, use the **security static-wep-key** command.

security static-wep-key {**authentication** {**open** | **sharedkey** } | **encryption** {**104** | **40** } {**ascii** | **hex** | {**0** | **8** }*wep-key* | **wep-index** }}

Syntax Description	open	Open system authentication.
	sharedkey	Shared key authentication.
	0	Specifies an UNENCRYPTED password is used.
	8	Specifies an AES encrypted password is used.
	wep-key	Enter the name of the WEP key.

Command Default	None

Command Modes	config-wlan

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to authenticate 802.11 using shared key:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wlan profile-name wlan-id
Device(config-wlan)# security static-wep-key authentication sharedkey
```

security web-auth

To change the status of web authentication used on a WLAN, use the **security web-auth** command. To disable web authentication on a WLAN, use the **no** form of the command.

security web-auth [**authentication-list** *authentication-list-name* | **on-macfilter-failure** | **parameter-map** *parameter-map-name*]

no security web-auth [**authentication-list** [**authentication-list-name**] | **on-macfilter-failure** | **parameter-map** [**parameter-name**]]

Syntax Description		
	authentication-list *authentication-list-name*	Sets the authentication list for IEEE 802.1x.
	on-macfilter-failure	Enables web authentication on MAC failure.
	parameter-map *parameter-map-name*	Configures the parameter map.

Command Default   Web authentication is disabled.

Command Modes   WLAN configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples

The following example shows how to configure the authentication-list web authentication on a WLAN:

```
Device(config-wlan)# security web-auth authentication-list test
```

security wpa akm

To configure authentication key management using Cisco Centralized Key Management (CCKM), use the **security wpa akm** command. To disable the authentication key management for Cisco Centralized Key Management, use the **no** form of the command.

security wpa [**akm** { **cckm** | **dot1x** | **ft** | **pmf** | **psk** } | **wpa1** [**ciphers** { **aes** | **tkip** }] | **wpa2** [**ciphers** { **aes** }]]
no security wpa [**akm** { **cckm** | **dot1x** | **ft** | **pmf** | **psk** } | **wpa1** [**ciphers** { **aes** | **tkip** }] | **wpa2** [**ciphers** { **aes** }]]

Syntax Description		
	akm	Configures the Authentication Key Management (AKM) parameters.
	aes	Configures AES (Advanced Encryption Standard) encryption support.
	cckm	Configures Cisco Centralized Key Management support.
	ciphers	Configures WPA ciphers.
	dot1x	Configures 802.1x support.
	ft	Configures fast transition using 802.11r.
	pmf	Configures 802.11w management frame protection.
	psk	Configures 802.11r fast transition pre-shared key (PSK) support.
	tkip	Configures Temporal Key Integrity Protocol (TKIP) encryption support.
	wpa2	Configures Wi-Fi Protected Access 2 (WPA2) support.

Command Default By default Wi-Fi Protected Access2, 802.1x are enabled. WPA2, PSK, CCKM, FT dot1x, FT PSK, PMF dot1x, PMF PSK, FT Support are disabled. The FT Reassociation timeout is set to 20 seconds, PMF SA Query time is set to 200.

Command Modes WLAN Configuration (config-wlan)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to configure CCKM on the WLAN.

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
```

```
Device(config)# wlan wlan1
Device(config-wlan)#security wpa akm cckm
```

security wpa akm ft sae

To enable 802.11r Fast Transition on an SAE security–enabled WLAN, use the **security wpa akm ft sae** command.

security wpa akm ft sae

Syntax Description	security	Configures the security policy for a WLAN.
	wpa	Configures WPA/WPA2 Support for a WLAN.
	akm	Configures Auth Key Management.
	ft	Configures 802.11r Fast Transition.
	sae	Configures SAE support.

Command Default	None

Command Modes	WLAN configuration mode (config-wlan)

Command History	Release	Modification
	Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Examples

The following example shows how to enable 802.11r Fast Transition on an SAE security–enabled WLAN:

```
Device# configure terminal
Device(config)# wlan wlan-test 3 ssid-test
Device(config-wlan)# security ft
Device(config-wlan)# no security wpa wpa2
Device(config-wlan)# security wpa psk set-key ascii 0 123456789
Device(config-wlan)# no security wpa akm dot1x
Device(config-wlan)# security wpa akm ft sae
Device(config-wlan)# security wpa wpa3
Device(config-wlan)# security pmf mandatory
Device(config-wlan)# no shutdown
```

security wpa akm owe

To enable Auth Key Management (AKM) Opportunistic Wireless Encryption (OWE), use the **security wpa akm owe** command. Use the **no** form of this command to disable the feature.

security wpa akm owe

no security wpa akm owe

Syntax Description		
	security	Configures the security policy for a WLAN.
	wpa	Configures WPA/WPA2 Support for a WLAN.
	akm	Configures Auth Key Management.
	owe	Configures OWE support.

Command Default	None

Command Modes	WLAN configuration mode (config-wlan)

Command History	**Release**	**Modification**
	Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

The following example shows how to enable Auth Key Management (AKM) Opportunistic Wireless Encryption (OWE):

```
Device# configure terminal
Device(config)# wlan wlan-test 3 ssid-test
Device(config-wlan)# security wpa akm owe
```

security wpa akm psk

To enable Auth Key Management (AKM) pre-shared key (PSK), use the **security wpa akm psk** command. Use the **no** form of this command to disable the feature.

security wpa akm psk

no security wpa akm psk

Syntax Description	**security**	Configures the security policy for a WLAN.
	wpa	Configures WPA/WPA2 Support for a WLAN.
	akm	Configures Auth Key Management.
	psk	Configures PSK support.

Command Default   None

Command Modes   WLAN configuration mode (config-wlan)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

The following example shows how to enable Auth Key Management (AKM) pre-shared key (PSK):

```
Device# configure terminal
Device(config)# wlan wlan-test 3 ssid-test
Device(config-wlan)# security wpa akm psk
```

security wpa akm sae

To enable Auth Key Management (AKM) Secure Agile Exchange (SAE), use the **security wpa akm sae pwe** command. Use the **no** form of this command to disable the feature.

security wpa akm sae pwe { h2e | hnp | both-h2e-hnp}

no security wpa akm sae pwe { h2e | hnp | both-h2e-hnp}

Syntax Description		
	security	Configures the security policy for a WLAN.
	wpa	Configures WPA/WPA2 Support for a WLAN.
	akm	Configures Auth Key Management.
	sae	Configures SAE support.
	pwe	Configures SAE Password Element.
	h2e	Configures Hash To Element only (Disables Hunting and Pecking).
	hnp	Configures Hunting And Pecking only (Disables Hash To Element).
	both-h2e-hnp	Configures both Hash to Element and Hunting and Pecking support (Is the default option).

Command Default   None

Command Modes   WLAN configuration mode (config-wlan)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

The following example shows how to enable Auth Key Management (AKM) Secure Agile Exchange (SAE):

```
Device# configure terminal
Device(config)# wlan wlan-test 3 ssid-test
Device(config-wlan)# security wpa akm sae
```

security wpa akm sae pwe

To enable Auth Key Management (AKM) Secure Agile Exchange (SAE) PWE support, use the **security wpa akm sae pwe** command.

security wpa akm sae pwe { h2e | hnp | both-h2e-hnp}

Syntax Description		
	h2e	Hash-to-Element only; disables HnP.
	hnp	Hunting and Pecking only; disables H2E.
	Both-h2e-hnp	Both Hash-to-Element and Hunting and Pecking support (Is the default option).

Command Default None

Command Modes Global Configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was modified.

Usage Guidelines

This example shows how to enable AKM SAE PWE support:

```
Device# configure terminal
Device(config)# wlan WPA3 1 WPA3
Device(config-wlan)# no security wpa akm dot1x
Device(config-wlan)# no security ft over-the-ds
Device(config-wlan)# no security ft
Device(config-wlan)# no security wpa wpa2
Device(config-wlan)# security wpa wpa2 ciphers aes
Device(config-wlan)# security wpa psk set-key ascii 0 Cisco123
Device(config-wlan)# security wpa wpa3
Device(config-wlan)# security wpa akm sae
Device(config-wlan)# security wpa akm sae pwe
Device(config-wlan)# no shutdown
Device(config-wlan)# end
```

segment

To configure a segment name that identifies a group of devices that share the same application services, use the **segment** command. To remove a segment, use the **no** form of this command.

segment *segment-name*

no segment

Syntax Description	*segment-name*	Segment name, which can be a maximum of 63 alphanumeric characters.

Command Default   Segment name is not configured.

Command Modes   SD Service Configuration (config-sd-service)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Examples

The following example shows how to configure a segment name that identifies a group of devices that share the same application services:

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# avc sd-service
Device(config-sd-service)# segment test-segment
```

sensor environment

To configure the AP sensor environment, use the **sensor environment** command. Use the **no** form of this command to disable this feature.

sensor environment { **air-quality** | **temperature** }

no sensor environment { **air-quality** | **temperature** }

| Syntax Description | **air-quality** | Specifies the air quality sensor. |
| | **temperature** | Specifies the temperature and humidity sensor. |

Command Default None

Command Modes AP profile configuration mode

Command History

Release	Modification
Cisco IOS XE Cupertino 17.8.1	This command was introduced.

Example

The following example shows you how to configure the AP sensor environment:

```
Device(config)# ap profile ap-profile-name
Device(config-ap-profile)# sensor environment air-quality
```

sequence-number ethernet

To configure the power policy for Ethernet in the wireless power profile configuration mode, use the *sequence-number* **ethernet** command. Use the **no** form of this command to disable the feature.

sequence-number **ethernet** { **GigabitEthernet0** | **GigabitEthernet1 speed** { **1000mbps** | **100mbps** | **2500mbps** | **5000mbps** } | **LAN1** | **LAN2** | **LAN3 state disable** }

no *sequence-number* **ethernet** { **GigabitEthernet0** | **GigabitEthernet1 speed** { **1000mbps** | **100mbps** | **2500mbps** | **5000mbps** } | **LAN1** | **LAN2** | **LAN3 state disable** }

Syntax Description	*sequence-number*	The power profile settings are ordered by sequence numbers. AP derating takes place as per the sequence number entered. The same combination of interface identifiers and parameter values does not appear in another sequence number. The same interface with the same parameter can appear multiple times with different parameter values.
	GigabitEthernet0	Configures GigabitEthernet0.
	GigabitEthernet1	Configures GigabitEthernet1.
	speed	Configures the Ethernet speed limit.
		Note Ethernet speed configuration is not operational in Cisco IOS XE Cupertino 17.8.1.
	1000mbps	Configures the Ethernet speed limit to 1000 Mbps.
	100mbps	Configures the Ethernet speed limit to 100 Mbps.
	2500mbps	Configures the Ethernet speed limit to 2500 Mbps.
	5000mbps	Configures the Ethernet speed limit to 5000 Mbps.
	LAN1	Configures the LAN1 port.
	LAN2	Configures the LAN2 port.
	LAN3	Configures the LAN3 port.

Command Default	None

Command Modes	Wireless power profile configuration mode

Command History	**Release**	**Modification**
	Cisco IOS XE Cupertino 17.8.1	This command was introduced.

Example

The following example shows how to configure the power policy for Ethernet in the wireless power profile configuration mode:

```
Device(config)# wireless profile power power-profile-name
Device(config-wireless-power-profile)# 10 ethernet gigabitethernet1 speed 1000mbps
```

Note   The Ethernet speed configuration is not operational in Cisco IOS XE Cupertino 17.8.1.

---

sequence-number radio

To configure the power policy for radio in the wireless power profile configuration mode, use the *sequence-number* **radio** command. Use the **no** form of this command to disable the feature.

sequence-number **radio** { **24ghz** | **5ghz** | **6ghz** | **secondary-5ghz** } **state shutdown**

no *sequence-number* **radio** { **24ghz** | **5ghz** | **6ghz** | **secondary-5ghz** } **state shutdown**

Syntax Description	*sequence-number*	The power profile settings are ordered by sequence numbers. AP derating takes place as per the sequence number entered. The same combination of interface identifiers and parameter values does not appear in another sequence number. The same interface with the same parameter can appear multiple times with different parameter values.
	24ghz	Configures 2.4-GHz radio.
	5ghz	Configures 5-GHz radio.
	6ghz	Configures 6-GHz radio.
	secondary-5ghz	Configures secondary 5-GHz radio.
	state shutdown	Specifies the radio state as down.

Command Default None

Command Modes Wireless power profile configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.8.1	This command was introduced.

Example

The following example shows how to configure the power policy for radio in the wireless power profile configuration mode:

```
Device(config)# wireless profile power power-profile-name
Device(config-wireless-power-profile)# 20 radio 6ghz state shutdown
```

sequence-number usb 0 state disable

To configure the power policy for USB, in the wireless power profile configuration mode, use the *sequence-number* **usb 0 state disable** command. Use the **no** form of this command to disable the feature.

sequence-number **usb 0 state disable**

no *sequence-number* **usb 0 state disable**

| Syntax Description | *sequence-number* | The power profile settings are ordered by sequence numbers. AP derating takes place as per the sequence number entered. The same combination of interface identifiers and parameter values does not appear in another sequence number. The same interface with the same parameter can appear multiple times with different parameter values. |

Command Default None

Command Modes Wireless power profile configuration mode

Command History

Release	Modification
Cisco IOS XE Cupertino 17.8.1	This command was introduced.

Example

The following example shows how to configure the power policy for USB, in the wireless power profile configuration mode:

```
Device(config)# wireless profile power power-profile-name
Device(config-wireless-power-profile)# 30 usb 0 state disable
```

server-uri

To configure the server Uniform Resource Identifier (URI) of an Online Sign-Up (OSU) operator, use the **server-uri** command. To remove the server URI, use the **no** form of the command.

server-uri *server-uri*

Syntax Description	*server-uri*	Server URI of an OSU operator.

Command Default   None

Command Modes   ANQP OSU Provider Configuration (config-anqp-osu-provider)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure the server URI of an OSU operator:

```
Device(config-wireless-anqp-server)# osu-provider my-osu
Device(config-anqp-osu-provider)# server-uri yyyy
```

service-policy

To configure the quality of service (QoS) service policy, use the **service-policy** command. To disable a QoS policy, use the **no** form of this command.

service-policy { **client** | **input** | **output** } *policy-name*
no { **client** | **input** | **output** } *policy-name*

Syntax Description

client	Assigns a policy map to all clients in the WLAN.
input	Assigns an input policy map.
output	Assigns an output policy map.
policy-name	The policy map name.

Command Default   None

Command Modes   Wireless policy configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples

This example shows how to configure the input service policy:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy default-policy-profile
Device(config-wireless-policy)# service-policy input test1
```

service-policy qos

To configure a QoS service policy, use the **service-policy qos** command.

service-policy qos {**input** | **output**}*policy-name*

Syntax Description	**input**	Input QoS policy.
	output	Output QoS policy.
	policy-name	Policy name.

Command Default	None

Command Modes	config-service-template

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure an output QoS policy:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# service-template fabric-profile-name
Device(config-service-template)# service-policy qos output policy-name
```

service-template

To configure service template, use the **service-template** command.

service-template *service-template-name* {**access-group** *acl_list* | **vlan** *vlan_id* | **absolute-timer** *seconds* | **service-policy qos** {**input** | **output**}}

Syntax Description		
	service-template-name	Name of the service template.
	acl_list	Access list name to be applied.
	vlan_id	VLAN ID. The VLAN ID value ranges from 1 to 4094.
	seconds	Session timeout value for service template. The session timeout value ranges from 1 to 65535 seconds.
	service-policy qos {**input**	**output**}	QoS policies for client.

Command Default	None
Command Modes	Global configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines None

The following example shows how to configure service template:

```
Device#configure terminal
Device(config)#service-template cisco-phone-template
Device(config-service-template)#access-group foo-acl
Device(config-service-template)#vlan 100
Device(config-service-template)#service-policy qos input foo-qos
Device(config-service-template)#end
```

service timestamps

To configure the system to time-stamp debugging or logging messages, use the**service timestamps** command in global configuration commands. Use the **no** form of this command to disable this service.

service timestamps **debug log** {**datetime** | **uptime***localtimemsecshow-timezoneyear*}
no service timestamps **debuglog**

Syntax Description	**debug**	Debug as the timestamp message type.
	log	Log as the timestamp message type.
	datetime	**datetime**
	uptime	(Optional) Time stamp with time since the system was rebooted.
	localtime	(Optional) Time stamp relative to the local time zone.
	msec	(Optional) Include milliseconds in the date and time stamp.
	show-timezone	(Optional) Include the time zone name in the time stamp.
	year	(Optional) Include year in timestamp.

Command Default	No time-stamping.
	If **service timestamps** is specified with no arguments or keywords, default is **service timestamps debug uptime**.
	The default for **service timestamps debugdatetime** is to format the time in UTC, with no milliseconds and no time zone name.
	The command **no service timestamps** by itself disables time stamps for both debug and log messages.

Command Modes	Global configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Amsterdam 17.1.1s	This command was introduced in a release earlier than Cisco IOS XE Amsterdam 17.1.1s.

Usage Guidelines	Time stamps can be added to either debugging or logging messages independently. The uptime form of the command adds time stamps in the format HHHH:MM:SS, indicating the time since the system was rebooted. The datetime form of the command adds time stamps in the format MMM DD HH:MM:SS, indicating the date and time according to the system clock. If the system clock has not been set, the date and time are preceded by an asterisk (*) to indicate that the date and time are probably not correct.

Example

The following example enables time stamps on debugging messages, showing the time since reboot:

```
Device(config)# service timestamps debug uptime
```

The following example enables time stamps on logging messages, showing the current time and date relative to the local time zone, with the time zone name included:

```
Device(config)# service timestamps log datetime localtime show-timezone
```

session-timeout

To configure session timeout for clients associated to a WLAN, use the **session-timeout** command. To restore the default value, use the **no** form of this command.

session-timeout *seconds*
no **session-timeout**

Syntax Description	*seconds*	Timeout or session duration in seconds. The range is from 300 to 86400. The default value is 1800.
		Configuring 86400 is equivalent to max timeout. And value 0 is not recommended.

Command Default	None

Command Modes	WLAN configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure a session timeout to 3600 seconds:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)#wireless profile policy policy1
Device(config-wireless-policy)#session-timeout 3600
```

set

To classify IP traffic by setting a Differentiated Services Code Point (DSCP) or an IP-precedence value in the packet, use the **set** command in policy-map class configuration mode. Use the **no** form of this command to remove traffic classification.

set
cos | **dscp** | **precedence** | **ip** | **qos-group** | **wlan**
set cos
{*cos-value* } | {**cos** | **dscp** | **precedence** | **qos-group** | **wlan**} [**table** *table-map-name*]
set dscp
{*dscp-value* } | {**cos** | **dscp** | **precedence** | **qos-group** | **wlan**} [**table** *table-map-name*]
set ip {**dscp** | **precedence**}
set precedence {*precedence-value* } | {**cos** | **dscp** | **precedence** | **qos-group**} [**table** *table-map-name*]
set qos-group
{*qos-group-value* | **dscp** [**table** *table-map-name*] | **precedence** [**table** *table-map-name*]}
set wlan user-priority
user-priority-value | **costable** *table-map-name* | **dscptable** *table-map-name* | **qos-grouptable** *table-map-name* | **wlantable** *table-map-name*

Syntax Description	**cos**	Sets the Layer 2 class of service (CoS) value or user priority of an outgoing packet. You can specify these values:

- *cos-value*—CoS value from 0 to 7. You also can enter a mnemonic name for a commonly used value.

- Specify a packet-marking category to set the CoS value of the packet. If you also configure a table map for mapping and converting packet-marking values, this establishes the "map from" packet-marking category. Packet-marking category keywords:

  - **cos**—Sets a value from the CoS value or user priority.

  - **dscp**—Sets a value from packet differentiated services code point (DSCP).

  - **precedence**—Sets a value from packet precedence.

  - **qos-group**—Sets a value from the QoS group.

  - **wlan**—Sets the WLAN user priority values.

- (Optional)**table** *table-map-name*—Indicates that the values set in a specified table map are used to set the CoS value. Enter the name of the table map used to specify the CoS value. The table map name can be a maximum of 64 alphanumeric characters.

  If you specify a packet-marking category but do not specify the table map, the default action is to copy the value associated with the packet-marking category as the CoS value. For example, if you enter the **set cos precedence** command, the precedence (packet-marking category) value is copied and used as the CoS value.

dscp	Sets the differentiated services code point (DSCP) value to mark IP(v4) and IPv6 packets. You can specify these values:
	• *cos-value*—Number that sets the DSCP value. The range is from 0 to 63. You also can enter a mnemonic name for a commonly used value.
	• Specify a packet-marking category to set the DSCP value of the packet. If you also configure a table map for mapping and converting packet-marking values, this establishes the "map from" packet-marking category. Packet-marking category keywords:
	• **cos**—Sets a value from the CoS value or user priority.
	• **dscp**—Sets a value from packet differentiated services code point (DSCP).
	• **precedence**—Sets a value from packet precedence.
	• **qos-group**—Sets a value from the QoS group.
	• **wlan**—Sets a value from WLAN.
	• (Optional)**table** *table-map-name*—Indicates that the values set in a specified table map will be used to set the DSCP value. Enter the name of the table map used to specify the DSCP value. The table map name can be a maximum of 64 alphanumeric characters.
	If you specify a packet-marking category but do not specify the table map, the default action is to copy the value associated with the packet-marking category as the DSCP value. For example, if you enter the **set dscp cos** command, the CoS value (packet-marking category) is copied and used as the DSCP value.
ip	Sets IP values to the classified traffic. You can specify these values:
	• **dscp**—Specify an IP DSCP value from 0 to 63 or a packet marking category.
	• **precedence**—Specify a precedence-bit value in the IP header; valid values are from 0 to 7 or specify a packet marking category.

precedence	Sets the precedence value in the packet header. You can specify these values:
	
	• *precedence-value*— Sets the precedence bit in the packet header; valid values are from 0 to 7. You also can enter a mnemonic name for a commonly used value.
	
	• Specify a packet marking category to set the precedence value of the packet.
	
	    • **cos**—Sets a value from the CoS or user priority.
	
	    • **dscp**—Sets a value from packet differentiated services code point (DSCP).
	
	    • **precedence**—Sets a value from packet precedence.
	
	    • **qos-group**—Sets a value from the QoS group.
	
	• (Optional)**table** *table-map-name*—Indicates that the values set in a specified table map will be used to set the precedence value. Enter the name of the table map used to specify the precedence value. The table map name can be a maximum of 64 alphanumeric characters.
	
	If you specify a packet-marking category but do not specify the table map, the default action is to copy the value associated with the packet-marking category as the precedence value. For example, if you enter the **set precedence cos** command, the CoS value (packet-marking category) is copied and used as the precedence value.

qos-group	Assigns a QoS group identifier that can be used later to classify packets.
	• *qos-group-value*—Sets a QoS value to the classified traffic. The range is 0 to 31. You also can enter a mnemonic name for a commonly used value.
	• **dscp**—Sets the original DSCP field value of the packet as the QoS group value.
	• **precedence**—Sets the original precedence field value of the packet as the QoS group value.
	• (Optional)**table** *table-map-name*—Indicates that the values set in a specified table map will be used to set the DSCP or precedence value. Enter the name of the table map used to specify the value. The table map name can be a maximum of 64 alphanumeric characters.
	If you specify a packet-marking category (**dscp** or **precedence**) but do not specify the table map, the default action is to copy the value associated with the packet-marking category as the QoS group value. For example, if you enter the **set qos-group precedence** command, the precedence value (packet-marking category) is copied and used as the QoS group value.

wlan user-priority *wlan-user-priority*	Assigns a WLAN user-priority to the classified traffic. You can specify these values: • *wlan-user-priority*—Sets a WLAN user priority to the classified traffic. The range is 0 to 7. • **cos**—Sets the Layer 2 CoS field value as the WLAN user priority. • **dscp**—Sets the DSCP field value as the WLAN user priority. • **precedence**—Sets the precedence field value as the WLAN user priority. • **wlan**—Sets the WLAN user priority field value as the WLAN user priority. • (Optional)**table** *table-map-name*—Indicates that the values set in a specified table map will be used to set the WLAN user priority value. Enter the name of the table map used to specify the value. The table map name can be a maximum of 64 alphanumeric characters. If you specify a packet-marking category but do not specify the table map, the default action is to copy the value associated with the packet-marking category as the WLAN user priority. For example, if you enter the **set wlan user-priority cos** command, the cos value (packet-marking category) is copied and used as the WLAN user priority.

Command Default   No traffic classification is defined.

Command Modes   Policy-map class configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was i
	The **cos**, **dscp**, **qos-g**

Usage Guidelines   For the **set dscp** *dscp-value* command, the **set cos** *cos-value* command, and the **set ip precedence** *precedence-value* command, you can enter a mnemonic name for a commonly used value. For example, you can enter the **set dscp af11** command, which is the same as entering the **set dscp 10** command. You can enter the **set ip precedence critical** command, which is the same as entering the **set ip precedence 5** command. For a list of supported mnemonics, enter the **set dscp ?** or the **set ip precedence ?** command to see the command-line help strings.

When you configure the **set dscp cos** command, note the following: The CoS value is a 3-bit field, and the DSCP value is a 6-bit field. Only the three bits of the CoS field are used.

When you configure the **set dscp qos-group** command, note the following:

- The valid range for the DSCP value is a number from 0 to 63. The valid value range for the QoS group is a number from 0 to 99.
- If a QoS group value falls within both value ranges (for example, 44), the packet-marking value is copied and the packets is marked.
- If QoS group value exceeds the DSCP range (for example, 77), the packet-marking value is not be copied and the packet is not marked. No action is taken.

The **set qos-group** command cannot be applied until you create a service policy in policy-map configuration mode and then attach the service policy to an interface or ATM virtual circuit (VC).

To return to policy-map configuration mode, use the **exit** command. To return to privileged EXEC mode, use the **end** command.

Examples

This example shows how to assign DSCP 10 to all FTP traffic without any policers:

```
Device(config)# policy-map policy_ftp
Device(config-pmap)# class-map ftp_class
Device(config-cmap)# exit
Device(config)# policy policy_ftp
Device(config-pmap)# class ftp_class
Device(config-pmap-c)# set dscp 10
Device(config-pmap)# exit
```

You can verify your settings by entering the **show policy-map** privileged EXEC command.

set trace capwap ap ha

To trace the control and provisioning of wireless access point high availability, use the **set trace capwap ap ha** command.

set trace capwap ap ha [**detail** | **event** | **dump** | {**filter** [**none** [**switch** *switch*] | *filter_name* [*filter_value* [**switch** *switch*]]] | **filtered***switch***level** {**default***trace_level*} [**switch** *switch*]}]

Syntax Description	**detail**	(Optional) Specifies the wireless CAPWAP HA details.
	event	(Optional) Specifies the wireless CAPWAP HA events.
	dump	(Optional) Specifies the wireless CAPWAP HA output.
	filter *mac*	Specifies the MAC address.
	switch switch number	Specifies the switch number.
	none	(Optional) Specifies the no filter option.
	switch *switch*	(Optional) Specifies the device number.
	filter name	Trace adapted flag filter name.
	filter_value	(Optional) Value of the filter.
	switch *switch*	(Optional) Specifies the device number.
	filtered	Specifies the filtered traces messages.
	switch	Specifies the switch number.
	level	Specifies the trace level.
	default	Specifies the unset trace level value.
	trace_level	Specifies the trace level.
	switch *switch*	(Optional) Specifies the device number.

Command Default	None

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to display the wireless CAPWAP HA:

```
Device# set trace capwap ap ha detail filter mac WORD switch number
```

set trace mobility ha

To debug the wireless mobility high availability in the , use the **set trace mobility ha** command.

set trace mobility ha [**event** | **detail** | **dump**] {**filter**[**mac** *WORD switch switch number*] [**none** [**switch** *switch*] | *filter_name* [*filter_value* [**switch** *switch*]]] | **level** {**default***trace_level*} [**switch** *switch*] {**filtered***switch*}}

Syntax Description	event	(Optional) Specifies the wireless mobility high availability events.
	detail	(Optional) Specifies the wireless mobility high availability details.
	dump	(Optional) Specifies the wireless mobility high availability output.
	filter	Specifies to trace adapted flag filter.
	mac	Specifies the MAC address.
	WORD switch	Specifies the switch.
	switch number	Specifies the switch number. The value ranges from one to four.
	none	Specifies no trace adapted flag filter.
	switch *switch*	(Optional) Specifies the device number.
	filter_name	Trace adapted flag filter name.
	filter_value	Trace adapted flag filter value.
	switch *switch*	Specifies the device number.
	level	Specifies the trace level value.
	default	Specifies the un-set trace level value.
	trace_level	Specifies the trace level value.
	switch *switch*	Specifies the device number.
	filtered	Specifies the filtered trace messages.
	switch	Specifies the switch.

Command Default   None

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to display wireless mobility high availability details:

```
Device# set trace mobility ha detail filter mac WORD
[08/27/13 10:38:35.349 UTC 1 8135] Invalid src ip: 169.254.1.1
[08/27/13 10:38:35.349 UTC 2 8135] Invalid sysIp: Skip plumbing MC-MA
tunnels.
[08/27/13 10:38:54.393 UTC 3 8135] Mobility version mismatch, v10 received,
 or m
sglen mismatch msglen=74 recvBytes=0, dropping
```

set trace qos ap ha

To trace wireless Quality of Service (QoS) high availability, use the **set trace qos ap ha** command.

set trace QOS ap ha [**event** | **error**] {**filter** [**MACnone** [**switch** *switch*] | *filter_name* [*filter_value* [**switch** *switch*]]] | **level** {**default***trace_level*} [**switch** *switch*]}

Syntax Description	**event**	(Optional) Specifies trace QoS wireless AP event.
	event *mac*	Specifies the MAC address of the AP.
	event *none*	Specifies no MAC address value.
	error	(Optional) Specifies trace QoS wireless AP errors.
	error *mac*	Specifies the MAC address of the AP.
	error *none*	Specifies no value.
	filter	Specifies the trace adapted flag filter.
	filter *mac*	Specifies the MAC address of the AP.
	filter *none*	Specifies no value.
	switch *switch*	Specifies the switch number.
	filter_name	(Optional) Specifies the switch filter name.
	filter_value	(Optional) Specifies the switch filter value. Value is one.
	switch *switch*	(Optional) Specifies the switch number. Value is one.
	level	Specifies the trace level.
	default	Specifies the trace QoS wireless AP default.
	trace_level	Trace level.
	switch *switch*	(Optional) Specifies the switch number. Value is one.

Command Default	None

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to trace wireless QoS high availability:

```
Device# set trace QOS ap ha
```

sgt-tag

To SGT tag for a fabric profile, use the **sgt-tag** command.

sgt-tag *value*

Syntax Description	*value* SGT tag value. Valid range is 2 to 65519.

Command Default   The default SGT tag value is 0.

Command Modes   config-wireless-fabric

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure an SGT tag value:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile fabric fabric-profile-name
Device(config-wireless-fabric)# sgt tag 8
```

site-tag

To map a site tag to the AP, use the **site-tag**command.

site-tag *site-tag-name*

Syntax Description	*site-tag-name* Name of the site tag.

Command Default None

Command Modes config-ap-tag

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines The AP will disconnect and rejoin after running this command.

Example

The following example shows how to configure a site tag:

```
Device(config-ap-tag)# site-tag sitetag1
```

snmp-server enable traps wireless

To enable wireless notifications for a host, use the **snmp-server enable traps wireless** command.

snmp-server enable traps wireless [**AP** | **bsnMobileStation** | **MESH** | **bsnAutoRF** | **rogue** | **wireless_mobility** | **RRM** | **bsnGeneral**]

Syntax Description		
	AP	Enables wireless SNMP traps for APs
	bsnMobileStation	Enables wireless client traps
	MESH	Enables wireless mesh traps
	bsnAutoRF	Enables wireless RF related traps
	rogue	Enables traps for wireless rogue
	wireless_mobility	Enables traps for wireless mobility
	RRM	Enables traps for wireless RRM
	bsnGeneral	Enables general controller traps

Command Default   None

Command Modes   Global Configuration (config)

Command History	Release	Modification
	Cisco IOS XE Bengaluru 17.4.1	This command was introduced.

Examples

The following example shows how to enable wireless notifications for a host:

```
Device# snmp-server enable traps wireless MESH
```

snmp-server group

To configure a new Simple Network Management Protocol (SNMP) group, use the **snmp-server group** command in global configuration mode. To remove a specified SNMP group, use the **no** form of this command.

snmp-server group *group-name* {**v1** | **v2c** | **v3** } [**access** [**ipv6** *named-access-list*] [*acl-numberacl-name*]] [**context** *context-name*] [**notify** *notify-view*] [**read** *read-view*] [**write** *write-view*] **no snmp-server group** *group-name* {**v1** | **v2c** | **v3** {**auth** | **noauth** | **priv**}} [**context** *context-name*]

Syntax Description		
	group-name	Name of the group.
	v1	Specifies that the group is using the SNMPv1 security model. SNMPv1 is the least secure of the possible SNMP security models.
	v2c	Specifies that the group is using the SNMPv2c security model.
		The SNMPv2c security model allows informs to be transmitted and supports 64-character strings.
	v3	Specifies that the group is using the SNMPv3 security model.
		SMNPv3 is the most secure of the supported security models. It allows you to explicitly configure authentication characteristics.
	context	(Optional) Specifies the SNMP context to associate with this SNMP group and its views.
	context-name	(Optional) Context name.
	read	(Optional) Specifies a read view for the SNMP group. This view enables you to view only the contents of the agent.
	read-view	(Optional) String of a maximum of 64 characters that is the name of the view.
		The default is that the read-view is assumed to be every object belonging to the Internet object identifier (OID) space (1.3.6.1), unless the **read** option is used to override this state.
	write	(Optional) Specifies a write view for the SNMP group. This view enables you to enter data and configure the contents of the agent.
	write-view	(Optional) String of a maximum of 64 characters that is the name of the view.
		The default is that nothing is defined for the write view (that is, the null OID). You must configure write access.
	notify	(Optional) Specifies a notify view for the SNMP group. This view enables you to specify a notify, inform, or trap.

notify-view	(Optional) String of a maximum of 64 characters that is the name of the view.
	By default, nothing is defined for the notify view (that is, the null OID) until the **snmp-server host** command is configured. If a view is specified in the **snmp-server group** command, any notifications in that view that are generated will be sent to all users associated with the group (provided a SNMP server host configuration exists for the user).
	Cisco recommends that you let the software autogenerate the notify view. See the "Configuring Notify Views" section in this document.
access	(Optional) Specifies a standard access control list (ACL) to associate with the group.
ipv6	(Optional) Specifies an IPv6 named access list. If both IPv6 and IPv4 access lists are indicated, the IPv6 named access list must appear first in the list.
named-access-list	(Optional) Name of the IPv6 access list.
acl-number	(Optional) The *acl-number* argument is an integer from 1 to 99 that identifies a previously configured standard access list.
acl-name	(Optional) The *acl-name* argument is a string of a maximum of 64 characters that is the name of a previously configured standard access list.

Command Default No SNMP server groups are configured.

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced in a release earlier than Cisco IOS XE Amsterdam 17.1.1s.

Usage Guidelines When a community string is configured internally, two groups with the name public are autogenerated, one for the v1 security model and the other for the v2c security model. Similarly, deleting a community string will delete a v1 group with the name public and a v2c group with the name public.

No default values exist for authentication or privacy algorithms when you configure the **snmp-server group** command. Also, no default passwords exist. For information about specifying a Message Digest 5 (MD5) password, see the documentation of the **snmp-server user** command.

Configuring Notify Views

The notify-view option is available for two reasons:

- If a group has a notify view that is set using SNMP, you may need to change the notify view.

- The **snmp-server host** command may have been configured before the **snmp-server group** command. In this case, you must either reconfigure the **snmp-server host** command, or specify the appropriate notify view.

Specifying a notify view when configuring an SNMP group is not recommended, for the following reasons:

- The **snmp-server host** command autogenerates a notify view for the user, and then adds it to the group associated with that user.

• Modifying the group's notify view will affect all users associated with that group.

Instead of specifying the notify view for a group as part of the **snmp-server group** command, use the following commands in the order specified:

1. **snmp-server user** --Configures an SNMP user.

2. **snmp-server group** --Configures an SNMP group, without adding a notify view .

3. **snmp-server host** --Autogenerates the notify view by specifying the recipient of a trap operation.

SNMP Contexts

SNMP contexts provide VPN users with a secure way of accessing MIB data. When a VPN is associated with a context, that VPN's specific MIB data exists in that context. Associating a VPN with a context enables service providers to manage networks with multiple VPNs. Creating and associating a context with a VPN enables a provider to prevent the users of one VPN from accessing information about users of other VPNs on the same networking device.

Use this command with the **context** *context-name* keyword and argument to associate a read, write, or notify SNMP view with an SNMP context.

Create an SNMP Group

The following example shows how to create the SNMP server group "public," allowing read-only access for all objects to members of the standard named access list "lmnop":

```
Device(config)# snmp-server group public v2c access lmnop
```

Remove an SNMP Server Group

The following example shows how to remove the SNMP server group "public" from the configuration:

```
Device(config)# no snmp-server group public v2c
```

Associate an SNMP Server Group with Specified Views

The following example shows SNMP context "A" associated with the views in SNMPv2c group "GROUP1":

```
Device(config)# snmp-server context A
Device(config)# snmp mib community commA
Device(config)# snmp mib community-map commA context A target-list commAVpn
Device(config)# snmp-server group GROUP1 v2c context A read viewA write viewA notify viewB
```

snmp-server subagent cache

To prevent CPU spikes in the controller during Simple Network Management Protocol (SNMP) polling, use the **snmp-server subagent cache** command. To disable the subagent cache, use the **no** form of this command.

snmp-server subagent cache [**timeout** *seconds*]

snmp-server subagent cache [**timeout** *seconds*]

Syntax Description	**timeout**	Specifies the subagent cache timeout.
	seconds	The server timeout value, in seconds. The valid values range from 1 to 100, with a default of 60.

Command Default	None

Command Modes	Global configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Dublin 17.11.1	This command was introduced.

Usage Guidelines	Use this command to prevent CPU spikes in the controller by clearing the cache at regular intervals.

Examples	The following example shows how to prevent CPU spikes in the controller during SNMP polling:

```
Device# configure terminal
Device(config)# snmp-server subagent cache
```

software auto-upgrade enable

To enable Auto-Upgrade feature, use the **software auto-upgrade enable** command.

> **Note**   If you disable this feature using the **no** form of the command, you need to manually auto-upgrade using the **install autoupgrade** command in priveledged EXEC mode.

software auto-upgrade enable

Syntax Description	This command has no keywords or arguments.

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Usage Guidelines

This example shows how to enable Auto-Upgrade feature:

```
Device# configure terminal
Device(config)# software auto-upgrade enable
Device(config)# end
```

source-interface

To configure the source interface to communicate with the controller, use the **source-interface** command. To remove the source interface, use the **no** form of this command.

source-interface *interface-name interface-number*

no source-interface

Syntax Description		
	interface-name	Name of the interface.
	interface-number	Interface number.

Command Default Source interface is not configured.

Command Modes SD Service Controller Configuration (config-sd-service-controller)

Command History	Release	Modification
	Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Examples The following example shows how to configure the source interface to communicate with the controller:

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# avc sd-service
Device(config-sd-service)# controller
Device(config-sd-service-controller)# source-interface vlan 12
```

ssid broadcast persistent

To enable the SSID broadcast mode, use the **ssid broadcast persistent** command. Use the **no** form of the command to disable the feature.

ssid broadcast persistent

no ssid broadcast persistent

Syntax Description	This command has no keywords or arguments.

Command Default   None

Command Modes   AP profile configuration (config-ap-profile)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines   Enabling or disabling this feature causes the AP to re-join.

Examples   The following example shows how to enable the SSID broadcast mode:

```
Device# configure terminal
Device(config)# ap profile ap-profile-name
Device(config-ap-profile)# ssid broadcast persistent
```

static-ip-mobility

To configure static IP mobility, use the **static-ip-mobility** command in wireless-policy configuration mode. To disable the configuration, use the **no** form of this command.

static-ip-mobility

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

wireless-policy configuration mode

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

This example shows how to enable static IP mobility:

```
Device# configure terminal
Device(config)# wireless profile policy test-policy
Device(config-wireless-policy)# static-ip-mobility
```

statistics ap-system-monitoring alarm-enable

To enable alarms for AP real-time statistics (CPU and Memory), use the **statistics ap-system-monitoring alarm-enable** command. Use the **no** form of this command to disable the feature.

[no] statistics ap-system-monitoring alarm-enable

Syntax Description	statistics	Configures the AP statistics.
	ap-system-monitoring alarm-enable	Enables alarms for AP real-time statistics (CPU and Memory).

Command Default None

Command Modes AP Profile Configuration (config-ap-profile)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Example

The following example shows how to enable alarms for AP real-time statistics (CPU and Memory):

```
Device(config)# ap profile default-ap-profile
Device(config-ap-profile)# statistics ap-system-monitoring alarm-enable
```

statistics ap-system-monitoring alarm-hold-time

To define the hold time interval before triggering the alarm, use the **statistics ap-system-monitoring alarm-hold-time** command.

statistics ap-system-monitoring alarm-hold-time *0-3600*

Syntax Description	**statistics**	Configures the AP statistics.
	ap-system-monitoring alarm-hold-time	Enables alarms for AP real-time statistics (CPU and Memory).
	0-3600	Specifies the alarm hold time interval in seconds.

Command Default	None

Command Modes	AP Profile Configuration (config-ap-profile)

Command History	**Release**	**Modification**
	Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Example

The following example shows how to define the hold time interval before triggering the alarm:

```
Device(config)# ap profile default-ap-profile
Device(config-ap-profile)# statistics ap-system-monitoring alarm-hold-time 60
```

statistics ap-system-monitoring alarm-retransmit-time

To define the interval between retransmissions of the trap alarm, use the **statistics ap-system-monitoring alarm-retransmit-time**

statistics ap-system-monitoring alarm-retransmit-time *0-65535*

Syntax Description	**statistics**	Configures the AP statistics.
	ap-system-monitoring alarm-retransmit-time	Define the interval between retransmissions of the trap alarm.
	0-65535	Specifies the interval between retransmissions of the trap alarm, in seconds.

Command Default	None

Command Modes	AP Profile Configuration (config-ap-profile)

Command History	Release	Modification
	Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Example

The following example shows how to define the interval between retransmissions of the trap alarm:

```
Device(config)# ap profile default-ap-profile
Device(config-ap-profile)# statistics ap-system-monitoring alarm-retransmit-time 60
```

statistics ap-system-monitoring cpu-threshold

To define the threshold precentage for CPU usage on the AP to trigger alarms, use the **statistics ap-system-monitoring cpu-threshold** command.

statistics ap-system-monitoring cpu-threshold *0-100*

Syntax Description	**statistics**	Configures the AP statistics.
	ap-system-monitoring cpu-threshold	Defines the threshold for CPU usage on AP to trigger alarms.
	0-100	Specifies the percentage of threshold for CPU usage on AP to trigger alarms.

Command Default	None

Command Modes	AP Profile Configuration (config-ap-profile)

Command History	**Release**	**Modification**
	Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Example

The following example shows how to define the threshold precentage for CPU usage on the AP to trigger alarms:

```
Device(config)# ap profile default-ap-profile
Device(config-ap-profile)# statistics ap-system-monitoring cpu-threshold 70
```

statistics ap-system-monitoring enable

To enable monitoring of AP real-time statistics (CPU and Memory), use the **statistics ap-system-monitoring enable** command. Use the **no** form of this command to disable the feature.

[no] statistics ap-system-monitoring enable

Syntax Description	**statistics**	Configures the AP statistics.
	ap-system-monitoring enable	Enables monitoring of AP real-time statistics (CPU and Memory).

Command Default None

Command Modes AP Profile Configuration (config-ap-profile)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Example

The following example shows how to enable monitoring of AP real-time statistics (CPU and Memory):

```
Device(config)# ap profile default-ap-profile
Device(config-ap-profile)# statistics ap-system-monitoring enable
```

statistics ap-system-monitoring mem-threshold

To define the threshold percentage for memory usage on the AP, to trigger alarms.

statistics ap-system-monitoring mem-threshold *0-100*

Syntax Description	**statistics**	Configures the AP statistics.
	ap-system-monitoring mem-threshold	Defines the threshold for memory usage on AP to trigger alarms.
	0-100	Specifies the percentage of threshold for memory usage on AP to trigger alarms.

Command Default   None

Command Modes   AP Profile Configuration (config-ap-profile)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Example

The following example shows how to define the threshold precentage for memory usage on the AP to trigger alarms:

```
Device(config)# ap profile default-ap-profile
Device(config-ap-profile)# statistics ap-system-monitoring mem-threshold 60
```

statistics ap-system-monitoring sampling-interval

To define the sampling interval, use the **statistics ap-system-monitoring sampling-interval**

statistics ap-system-monitoring sampling-interval *2-900*

Syntax Description	statistics	Configures the AP statistics.
	ap-system-monitoring sampling-interval	Defines the sampling interval.
	2-900	Specifies the sampling interval, in seconds.

Command Default   None

Command Modes   AP Profile Configuration (config-ap-profile)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Example

The following example shows how to define the sampling interval:

```
Device(config)# ap profile default-ap-profile
Device(config-ap-profile)# statistics ap-system-monitoring sampling-interval 100
```

statistics ap-system-monitoring stats-interval

To define the statistics interval, which gives more weight in the calculations to the statistics received in the last statistic interval seconds, use the **statistics ap-system-monitoring stats-interval**

statistics ap-system-monitoring stats-interval *120-900*

Syntax Description	**statistics**	Configures the AP statistics.
	ap-system-monitoring stats-interval	Defines the statistics interval, which gives more weight in the calculations to the statistics received in the last statistic interval seconds.
	120-900	Specifies the statistics interval, in seconds.

Command Default	None

Command Modes	AP Profile Configuration (config-ap-profile)

Command History	**Release**	**Modification**
	Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Example

The following example shows how to define the statistics interval:

```
Device(config)# ap profile default-ap-profile
Device(config-ap-profile)# statistics ap-system-monitoring stats-interval 120
```

stopbits

To configure the stop bits for the console port, use the **stopbits** command. To revert to the default values, use the **no** form of this command.

stopbits { *1* | *2* }

no stopbits { *1* | *2* }

Syntax Description	**1**	Specifies one stop bit.
	2	Specifies two stop bits.

Command Default 1 stop bit

Command Modes Line configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines You can configure the console ports only from a session on the console port.

Examples The following example shows how to configure the stop bits for the console port:

```
Device# configure terminal
Device(config)# line console 0
Device(config-line)# stopbits 1
```

switchport

To put an interface that is in Layer 3 mode into Layer 2 mode for Layer 2 configuration, use the **switchport** command in interface configuration mode. To put an interface in Layer 3 mode, use the **no** form of this command.

switchport
no switchport

Syntax Description	This command has no arguments or keywords.
Command Default	By default, all interfaces are in Layer 2 mode.
Command Modes	Interface configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

Use the **no switchport** command (without parameters) to set the interface to the routed-interface status and to erase all Layer 2 configurations. You must use this command before assigning an IP address to a routed port.

> **Note** This command is not supported on devices running the LAN Base feature set.

Entering the **no switchport** command shuts the port down and then reenables it, which might generate messages on the device to which the port is connected.

When you put an interface that is in Layer 2 mode into Layer 3 mode (or the reverse), the previous configuration information related to the affected interface might be lost, and the interface is returned to its default configuration.

> **Note** If an interface is configured as a Layer 3 interface, you must first enter the **switchport** command to configure the interface as a Layer 2 port. Then you can enter the **switchport access vlan** and **switchport mode** commands.

The **switchport** command is not used on platforms that do not support Cisco-routed ports. All physical ports on such platforms are assumed to be Layer 2-switched interfaces.

You can verify the port status of an interface by entering the **show running-config** privileged EXEC command.

Examples

This example shows how to cause an interface to cease operating as a Layer 2 port and become a Cisco-routed port:

```
Device(config-if)# no switchport
```

This example shows how to cause the port interface to cease operating as a Cisco-routed port and convert to a Layer 2 switched interface:

```
Device(config-if)# switchport
```

switchport access vlan

To configure a port as a static-access port, use the **switchport access vlan** command in interface configuration mode. To reset the access mode to the default VLAN mode for the device, use the **no** form of this command.

switchport access vlan {*vlan-id* }
no switchport access vlan

Syntax Description	*vlan-id* VLAN ID of the access mode VLAN; the range is 1 to 4094.
Command Default	The default access VLAN and trunk interface native VLAN is a default VLAN corresponding to the platform or interface hardware.
Command Modes	Interface configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

The port must be in access mode before the **switchport access vlan** command can take effect.

If the switchport mode is set to **access vlan** *vlan-id*, the port operates as a member of the specified VLAN. An access port can be assigned to only one VLAN.

The **no switchport access** command resets the access mode VLAN to the appropriate default VLAN for the device.

Examples

This example shows how to change a switched port interface that is operating in access mode to operate in VLAN 2 instead of the default VLAN:

```
Device(config-if)# switchport access vlan 2
```

switchport mode

To configure the VLAN membership mode of a port, use the **switchport mode** command in interface configuration mode. To reset the mode to the appropriate default for the device, use the **no** form of this command.

switchport mode {**access** | **dynamic** | {**auto** | **desirable**} | **trunk**}
noswitchport mode {**access** | **dynamic** | {**auto** | **desirable**} | **trunk**}

Syntax Description	access	Sets the port to access mode (either static-access or dynamic-access depending on the setting of the **switchport access vlan** interface configuration command). The port is set to access unconditionally and operates as a nontrunking, single VLAN interface that sends and receives nonencapsulated (non-tagged) frames. An access port can be assigned to only one VLAN.
	dynamic auto	Sets the port trunking mode dynamic parameter to auto to specify that the interface convert the link to a trunk link. This is the default switchport mode.
	dynamic desirable	Sets the port trunking mode dynamic parameter to desirable to specify that the interface actively attempt to convert the link to a trunk link.
	trunk	Sets the port to trunk unconditionally. The port is a trunking VLAN Layer 2 interface. The port sends and receives encapsulated (tagged) frames that identify the VLAN of origination. A trunk is a point-to-point link between two devices or between a device and a router.

Command Default The default mode is **dynamic auto**.

Command Modes Interface configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

Note Although visible in the CLI, the **dot1q-tunnel** keyword is not supported.

A configuration that uses the **access**,or **trunk** keywords takes effect only when you configure the port in the appropriate mode by using the **switchport mode** command. The static-access and trunk configuration are saved, but only one configuration is active at a time.

When you enter **access** mode, the interface changes to permanent nontrunking mode and negotiates to convert the link into a nontrunk link even if the neighboring interface does not agree to the change.

When you enter **trunk** mode, the interface changes to permanent trunking mode and negotiates to convert the link into a trunk link even if the interface connecting to it does not agree to the change.

When you enter **dynamic auto** mode, the interface converts the link to a trunk link if the neighboring interface is set to **trunk** or **desirable** mode.

When you enter **dynamic desirable** mode, the interface becomes a trunk interface if the neighboring interface is set to **trunk**, **desirable**, or **auto** mode.

To autonegotiate trunking, the interfaces must be in the same VLAN Trunking Protocol (VTP) domain. Trunk negotiation is managed by the Dynamic Trunking Protocol (DTP), which is a point-to-point protocol. However, some internetworking devices might forward DTP frames improperly, which could cause misconfigurations. To avoid this problem, configure interfaces connected to devices that do not support DTP to not forward DTP frames, which turns off DTP.

- If you do not intend to trunk across those links, use the **switchport mode access** interface configuration command to disable trunking.
- To enable trunking to a device that does not support DTP, use the **switchport mode trunk** and **switchport nonegotiate** interface configuration commands to cause the interface to become a trunk but to not generate DTP frames.

Access ports and trunk ports are mutually exclusive.

The IEEE 802.1x feature interacts with switchport modes in these ways:

- If you try to enable IEEE 802.1x on a trunk port, an error message appears, and IEEE 802.1x is not enabled. If you try to change the mode of an IEEE 802.1x-enabled port to trunk, the port mode is not changed.
- If you try to enable IEEE 802.1x on a port set to **dynamic auto** or **dynamic desirable**, an error message appears, and IEEE 802.1x is not enabled. If you try to change the mode of an IEEE 802.1x-enabled port to **dynamic auto** or **dynamic desirable**, the port mode is not changed.
- If you try to enable IEEE 802.1x on a dynamic-access (VLAN Query Protocol [VQP]) port, an error message appears, and IEEE 802.1x is not enabled. If you try to change an IEEE 802.1x-enabled port to dynamic VLAN assignment, an error message appears, and the VLAN configuration is not changed.

You can verify your settings by entering the **show interfaces** *interface-id* **switchport** privileged EXEC command and examining information in the *Administrative Mode* and *Operational Mode* rows.

Examples

This example shows how to configure a port for access mode:

```
Device(config)# interface gigabitethernet2/0/1
Device(config-if)# switchport mode access
```

This example shows how set the port to dynamic desirable mode:

```
Device(config)# interface gigabitethernet2/0/1
Device(config-if)# switchport mode dynamic desirable
```

This example shows how to configure a port for trunk mode:

```
Device(config)# interface gigabitethernet2/0/1
Device(config-if)# switchport mode trunk
```

tag rf

To configure a policy tag for an AP filter, use the **tag rf** command.

tag rf *rf-tag*

Syntax Description

rf-tag	RF tag name.

Command Default None

Command Modes config-ap-filter

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure a policy tag for an AP filter:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap filter name ap-filter-name
Device(config-ap-filter)# rf tag rf-tag-name
```

tag site

To configure a site tag for an AP filter, use the **tag site** *site-tag* command.

tag site *site-tag*

Syntax Description	*site-tag* Name of the site tag.

Command Default   None

Command Modes   config-ap-filter

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure a site tag for an AP filter:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# ap filter name ap-filter-name
Device(config-ap-filter)# site tag site-tag-name
```

terms-conditions

To configure the terms and conditions parameters for a Access Network Query Protocol (ANQP) server, use the **terms-conditions** command. To disable the terms and conditions, use the **no** form of this command.

terms-conditions {**filename** *filename* | **timestamp** *date time* | **urlfilter list** *url-filter-list*}

Syntax Description		
filename	Name of the terms and conditions file.
date	Timestamp date, in yyyy-mm-dd format.
time	Timestamp time, in hh:mm:ss format.
url-filter-list	Name of the URL filter list.

Command Default
Terms and conditions are not configured.

Command Modes
Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

The following example shows how to configure the timestamp:

```
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# terms-conditions timestamp 2020-02-20 20:20:20
```

tertiary (ap prime)

To configure a tertiary controller for AP fallback, use the **tertiary** command. To remove the tertiary controller from being used for AP priming, use the **no** form of this command.

tertiary *controller-name ip-address*

no tertiary *controller-name ip-address*

Syntax Description	*controller-name*	Name of the tertiary controller.
	ip-address	IPv4 or IPv6 address of the controller.

Command Default	None

Command Modes	AP prime configuration (config-priming)

Command History	**Release**	**Modification**
	Cisco IOS XE Cupertino 17.9.2	This command was introduced.

Examples

The following example shows how to configure a tertiary controller for AP fallback:

```
Device# configure terminal
Device(config)# wireless profile ap priming Prime-FX
Device(config-priming)# tertiary cccc 209.165.201.4
```

timezone delta

To configure timezone offset for an AP, use the **timezone delta** command. To remove the timezone offset for an AP, use the **no timezone** command.

timezone delta hour *offset-hour* **minute** *offset-minute*

Syntax Description		
hour *offset-hour*	Local hour difference from Coordinated Universal Time (UTC). Valid range is from -12 to 14.	
minute *offset-minute*	Local minute difference from UTC. Valid range is from 0 to 59.	

Command Default   AP timezone is not set.

Command Modes   AP profile configuration (config-ap-profile)

Command History	Release	Modification
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines   You can configure the AP timezone only for each AP profile. You cannot configure the AP timezone for each AP. To configure the timezone, either apply the current controller timezone or the time difference. By default, timezone is disabled.

Examples   The following example shows how to configure timezone offset for AP:

```
Device# configure terminal
Device(config)# ap profile test
Device(config-ap-profile)# timezone delta hour -12 minute 2
```

timezone use-controller

To configure AP timezone using the controller timezone, use the **timezone use-controller** command. To remove the controller timezone, use the **no timezone** command.

timezone use-controller

Syntax Description	This command has no arguments or keywords.

Command Default AP timezone is not set.

Command Modes AP profile configuration (config-ap-profile)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines You can configure the AP timezone only for each AP profile. You cannot configure timezone for each AP. To configure the timezone, you either apply the current controller timezone or use the time difference. By default, timezone is disabled.

Examples The following example shows how to configure AP timezone using the controller timezone:

```
Device# configure terminal
Device(config)# ap profile test
Device(config-ap-profile)# timezone use-controller
```

transport application-updates

To configure transport protocols to communicate with the controller, use the **transport** command. To disable transport protocols used to communicate with the controller, use the **no** form of this command.

transport application-updates { **http** | **https** } **url-prefix** *url-prefix-name*

no transport application-updates

Syntax Description		
http	Enables HTTP protocol.	
https	Enables HTTPS protocol.	
url-prefix	Enables URL prefix for application updates.	
url-prefix-name	URL prefix name.	

Command Default Transport communication protocols are not configured.

Command Modes SD Service Controller Configuration (config-sd-service-controller)

Command History	Release	Modification
	Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Usage Guidelines The transport protocol for application updates is used only for Cisco DNA Center.

Examples The following example shows how to configure transport protocols for communicating with the controller:

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# avc sd-service
Device(config-sd-service)# controller
Device(config-sd-service-controller)# transport application-updates https url-prefix cisco
```

transition-disable

To enable Transition Disable, use the **transition-disable** command.

transition-disable

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Usage Guidelines

This example shows how to enable Transition Disable:

```
Device# configure terminal
Device(config)# wlan WPA3 1 WPA3
Device(config-wlan)# transition-disable
Device(config-wlan)# end
```

trapflags ap ap-stats

To enable or disable the transmission of AP related traps, which are to be sent when the statistics are past the threshold, use the **trapflags ap ap-stats**. Use the **no** form of this command to disable the feature.

[no] trapflags ap ap-stats

Syntax Description

trapflags	Enables or disables the transmission of AP related trapflags.
ap ap-stats	Specifies the traps to be sent when the stats are past the threshold.

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Example

The following example shows how to enable or disable the transmission of AP related traps:

```
Device# configure terminal
Device(config)# trapflags ap ap-stats
```

trapflags ap broken-antenna

To enable an SNMP trap that is to be sent when antenna fails in any supported Cisco access point, use the **trapflags ap broken-antenna** command. To disable SNMP trap, use the **no** form of this command.

trapflags ap broken-antenna

no trapflags ap broken-antenna

Syntax Description	This command has no keywords or arguments.

Command Default   SNMP trap is not enabled.

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.4.1	This command was introduced.

Usage Guidelines   Antennas are coded with letters A, B, C, D, E, F, G, H, and so on. The Inter-Access Point Protocol (IAPP) report contains the letters of the antennas that are broken, and is copied to the syslog and to the SNMP trap.

Example

The following example shows how to enable a broken antenna SNMP trap:

```
Device# configure terminal
Device(config)# trapflags ap broken-antenna
```

trusted-port

To configure a port to become a trusted port, use the **trusted-port** command in IPv6 snooping policy mode or ND inspection policy configuration mode. To disable this function, use the **no** form of this command.

trusted-port
no trusted-port

Syntax Description	This command has no arguments or keywords.
Command Default	No ports are trusted.
Command Modes	ND inspection policy configuration
	IPv6 snooping configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

When the **trusted-port** command is enabled, limited or no verification is performed when messages are received on ports that have this policy. However, to protect against address spoofing, messages are analyzed so that the binding information that they carry can be used to maintain the binding table. Bindings discovered from these ports will be considered more trustworthy than bindings received from ports that are not configured to be trusted.

This example shows how to define an NDP policy name as policy1, place the switch in NDP inspection policy configuration mode, and configure the port to be trusted:

```
Device(config)# ipv6  nd inspection  policy1
Device(config-nd-inspection)# trusted-port
```

This example shows how to define an IPv6 snooping policy name as policy1, place the switch in IPv6 snooping policy configuration mode, and configure the port to be trusted:

```
Device(config)# ipv6 snooping policy policy1
Device(config-ipv6-snooping)# trusted-port
```

tunnel eogre source

To configure tunnel source interface when a specific per-tunnel configuration of tunnel source is not present, use the **tunnel eogre source** command.

tunnel eogre source {**gigabitethernet** | **loopback** | **vlan**} *interface-number*

Syntax Description

interface-number	Interface number.

Command Default   None

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Usage Guidelines   If a specific per-tunnel configuration of tunnel source is present, that one will be used.

Example

This example shows how to configure tunnel source interface:

```
Device(config)# tunnel eogre source vlan 21
```

tunnel eogre heartbeat

To configure tunnel keepalive heartbeat ping parameters, use the **tunnel eogre heartbeat** command.

tunnel eogre heartbeat {**interval** *interval* | **max-skip-count** *tolerable-heartbeats*}

Syntax Description	*interval*	Heartbeat interval, in seconds.
	tolerable-heartbeats	Tolerable dropped heartbeats.

Command Default	None

Command Modes	Global configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to configure tunnel keepalive heartbeat ping parameters:

```
Device(config)# tunnel eogre heartbeat 80
```

tunnel mode ethernet

To configure tunnel encapsulation method as Ethernet over GRE, use the **tunnel mode ethernet** command.

tunnel mode ethernet {**gre** {**ipv4** | **ipv6**} [**p2p**] | **manual**}

Syntax Description	**gre**	Ethernet over GRE.
	l2tpv3	L2TPv3 encapsulation.
	p2p	Provides point-to-point encapsulation over IPv4 or IPv6.
	manual	Manually configures L2TP parameters.

Command Default   None

Command Modes   Interface configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.
Cisco IOS XE Gibraltar 16.11.1	The **p2p** keyword was introduced.

Example

This example shows how to configure tunnel encapsulation method as Ethernet over GRE:

```
Device(config-if)# tunnel mode ethernet gre ipv4 p2p
```

tunnel eogre domain

To configure EoGRE redundancy domain, use the **tunnel eogre domain** command.

tunnel eogre domain *domain-name*

Syntax Description

domain-name	Domain name.

Command Default   None

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to configure EoGRE redundancy domain:

```
Device(config)# tunnel eogre domain domain1
```

tunnel eogre interface tunnel

To set the AAA-proxy key for the EoGRE tunnel interface, use the **tunnel eogre interface tunnel** command.

tunnel eogre interface tunnel *tunnel-inft-number* **aaa proxy key** {**0** | **8**} *key-string* **auth-port** *auth_port* **acct-port** *acct_port*

Syntax Description		
	tunnel-inft-number	Tunnel interface number.
	aaa	AAA configuration.
	proxy	AAA proxy configuration.
	key	AAA proxy key configuration.
		0-Specifies the string as an UNENCRYPTED key.
		8-Specifies the string as an AES encrypted key.
	key-string	String for the key.
	auth-port *auth_port*	Authorization port number.
	acct-port *acct_port*	Accounting port number.

Command Default None

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.
Cisco IOS XE Amsterdam 17.3.1	This command was modified. The following keywords and variables were added: **auth-port***auth_port* **acct-port***acct_port*

Example

This example shows how to set the proxy key for the EoGRE tunnel interface:

```
Device(config)# tunnel eogre interface tunnel 21 aaa proxy key 0 test
```

This example shows how to change the AAA ports:

```
Device(config)# tunnel eogre interface Tunnel1 aaa proxy key 0 test
 auth-port 24 acct-port 36
```

tunneled-eap-credential

To set tunneled Extensible Authentication Protocol (EAP) credential authentication, use the **tunneled-eap-credential** command. To remove the tunneled EAP credential authentication, use the **no** form of this command.

tunneled-eap-credential { **anonymous** | **certificate** | **hw-token** | **nfc** | **sim** | **softoken** | **username-password** | **usim** }

Syntax Description

anonymous	Anonymous authentication.
certificate	Authentication using certificate.
hw-token	Authentication using hardware token.
nfc	Authentication using Near-Field-Communication (NFC).
sim	Authentication using SIM card.
softoken	Authentication using soft token.
username-password	Authentication using a username and password.
usim	Authentication using USIM.

Command Default   None

Command Modes   ANQP NAI EAP Authentication (config-anqp-nai-eap-aut)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

The following example shows how to configure tunneled EAP credential authentication:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless hotspot anqp-server my_anqp
Device(config-wireless-anqp-server)# nai-realm myvenue.cisco.com
Device(config-anqp-nai-eap)# eap-method eap-aka
Device(config-anqp-nai-eap-auth)# tunneled-eap-credential anonymous
```

type

To display the contents of one or more files, use the **type** command in boot loader mode.

type *filesystem:/file-url...*

Syntax Description	*filesystem:*	Alias for a file system. Use **flash:** for the system board flash device; use **usbflash0:** for USB memory sticks.
	/file-url...	Path (directory) and name of the files to display. Separate each filename with a space.

Command Default   No default behavior or values.

Command Modes   Boot loader

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   Filenames and directory names are case sensitive.

If you specify a list of files, the contents of each file appear sequentially.

Examples   This example shows how to display the contents of a file:

```
Device: type flash:image_file_name
version_suffix: universal-122-xx.SEx
version_directory: image_file_name
image_system_type_id: 0x00000002
image_name: image_file_name.bin
ios_image_file_size: 8919552
total_image_file_size: 11592192
image_feature: IP|LAYER_3|PLUS|MIN_DRAM_MEG=128
image_family: family
stacking_number: 1.34
board_ids: 0x00000068 0x00000069 0x0000006a 0x0000006b
info_end:
```

udp-timeout

To configure timeout value for UDP sessions, use the **udp-timeout** command.

udp-timeout *timeout_value*

Syntax Description	*timeout_value*	Is the timeout value for UDP sessions.
		The range is from 1 to 30 seconds.
		Note The *public-key* and *resolver* parameter-map options are automatically populated with the default values. So, you need not change them.

Command Default	None

Command Modes	Profile configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

This example shows how to configure timeout value for UDP sessions:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# parameter-map type umbrella global
Device(config-profile)# token 57CC80106C087FB1B2A7BAB4F2F4373C00247166
Device(config-profile)# local-domain dns_wl
Device(config-profile)# udp-timeout 2
Device(config-profile)# end
```

umbrella-param-map

To configure the Umbrella OpenDNS feature for WLAN, use the **umbrella-param-map** command.

umbrella-param-map *umbrella-name*

Syntax Description	*umbrella-name*

Command Default	None

Command Modes	config-wireless-policy

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

This example shows how to configure the Umbrella OpenDNS feature for WLAN:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy default-policy-profile
Device(config-wireless-policy)# umbrella-param-map global
Device(config-wireless-policy)# end
```

update-timer

To configure the mDNS update timers for flex profile, use the **update-timer** command. To disable the command, use the **no** form of this command.

update-timer { **service-cache** *<1-100>* | **statistics** *<1-100>* }

update-timer { **service-cache** *<1-100>* | **statistics** *<1-100>* }

Syntax Description	**update-timer**	Configures the mDNS update timers for flex profile.
	service-cache *<1-100>*	Specifies the mDNS update service-cache timer for flex profile. The default value is one minute,
	statistics *<1-100>*	Specifies the mDNS update statistics timer for flex profile. The default value is one minute,

Command Default None

Command Modes mDNS flex profile configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Examples The following example shows how to configure the mDNS update timers for flex profile:

```
Device(config-mdns-flex-prof)# update-timer service-cache 20
```

url

To configure a URL for a Hotspot 2.0 venue, use the **url** command. To remove the URL for ta Hotspot 2.0 venue, use the **no** form of the command.

url *url*

Syntax Description	*url*	URL for the venue name.

Command Default   Venue URL is not configured.

Command Modes   Wireless ANQP Venue Configuration (config-anqp-venue-name)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

The following example shows how to configure a URL for a a Hotspot 2.0 venue:

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# venue test eng
Device(config-anqp-venue-name)#url www.cisco.com
```

username

To add a user who can access the Cisco Catalyst 9800 Series Controller using SSH, use the **username** command in configuration mode. If the user already exists, the password, the privilege level, or both change with this command. To delete the user from the system, use the **no** form of this command.

[no] username *username* **password** {**hash** | **plain**} *password* **role** {**admin** | **user**] [**disabled** [**email** email-address]] [**email** email-address]

For an existing user, use the following command option:

username username **password role** {admin | **user**} password

Syntax Description		
username	You should enter only one word which can include hyphen (-), underscore (_) and period (.).
	Note Only alphanumeric characters are allowed at an initial setup.
password	The command to use specify password and user role.
password	Password character length up to 40 alphanumeric characters. You must specify the password for all new users.
hash | plain	Type of password. Up to 34 alphanumeric characters.
role admin | user	Sets the privilege level for the user.
disabled	Disables the user according to the user's email address.
email *email-address*	The user's email address. For example, user1@example.com.
wlan-profile-name	Displays details of the WLAN profile.

Command Default   The initial user during setup.

Command Modes   Configuration

Usage Guidelines   The **username** command requires that the username and password keywords precede the hash / plain and the admin / user options.

Example 1

```
ncs/admin(config)# username admin password hash ###### role admin
ncs/admin(config)#
```

Example 2

```
ncs/admin(config)# username admin password plain Secr3tp@swd role admin
ncs/admin(config)#
```

Example 3

```
ncs/admin(config)# username admin password plain Secr3tp@swd role admin email
```

```
admin123@example.com
ncs/admin(config)#
```

venue

To configure a 802.11u venue information, use the **venue** command. To remove the venue, use the **no** form of the command.

venue *venue-name language-code* [*venue-url*]

Syntax Description	*venue-name*	Name of the venue.
		Should not exceed 220 characters.
	language-code	A three character language code for the operator. Use only the first three letters of the language, in lower case, for the language code. For example, use *eng* for English.
		To see the full list of language codes, go to: http://www.loc.gov/standards/iso639-2/php/code_list.php.
	venue-url	URL of the venue.

Command Default None

Command Modes Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure 802.11u venue information:

```
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# venue test eng cisco.com
```

vnid

To add a VXLAN network identifier (VNID) under the service template, use the **vnid** command.

vnid *vnid-name*

Syntax Description	*vnid-name* Name of the VNID.
Command Default	VNID is not configured.
Command Modes	Service Template Configuration (config-service-template)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Examples

The following example shows how to configure a VNID:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# service-template template
Device(config-service-template)# vnid  vnid-name
```

violation

To configure stream violation policy on periodic reevaluation, use the **violation** command.

violation {**drop** | **fallback**}

Syntax Description	**Parameter** **Description**
	drop Stream will be dropped on periodic reevaluation.
	fallback Stream will be demoted to BestEffort class on periodic reevaluation.

Command Default	None
Command Modes	config-media-stream

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure stream violation policy on periodic reevaluation:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless media-stream group my-media-group 224.0.0.0 224.0.0.223
Device(config-media-stream)# violation drop
```

vlan

To add a VLAN and to enter the VLAN configuration mode, use the **vlan** command in global configuration mode. To delete the VLAN, use the **no** form of this command.

vlan { *vlan-id* | **accounting** { **input** | **output** } | **configuration** *vlan-id* | **group** *word* **vlan-list** *vlan-id* | **internal allocation policy** { **ascending** | **descending** } }
no **vlan** *vlan-id*

Syntax Description	*vlan-id*	ID of the VLAN to be added and configured. The range is 1 to 4094. You can enter a single VLAN ID, a series of VLAN IDs separated by commas, or a range of VLAN IDs separated by hyphens.
	group *word* **vlan-list**	Enables creation of the VLAN group. The VLAN group name may contain up to 32 characters and must commence with a letter.
	accounting	VLAN accounting configuration.
	configuration	VLAN feature configuration mode for advanced service parameters. One or more VLANs can be created for the same settings. *id* refers to the VLAN configuration ID. For example, 1-10 or 15.
	internal	Internal VLAN allocation policy. It can be ascending or descending.

Command Default	None

Command Modes	Global configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure a VLAN:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# vlan 12
```

vlan configuration

To enter the VLAN configuration mode to configure VLAN features, use the **vlan configuration** command.

vlan configuration

Command Default None

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to enter the VLAN configuration mode to configure VLAN features, with the VLAN ID being 2:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# vlan configuration 2
```

vlan access-map

To create or modify a VLAN map entry for VLAN packet filtering, and change the mode to the VLAN access-map configuration, use the **vlan access-map** command in global configuration mode on the switch stack or on a standalone switch. To delete a VLAN map entry, use the **no** form of this command.

vlan access-map *name* [*number*]
no vlan access-map *name* [*number*]

| **Note** | This command is not supported on switches running the LAN Base feature set. |

Syntax Description	*name*	Name of the VLAN map.
	number	(Optional) The sequence number of the map entry that you want to create or modify (0 to 65535). If you are creating a VLAN map and the sequence number is not specified, it is automatically assigned in increments of 10, starting from 10. This number is the sequence to insert to, or delete from, a VLAN access-map entry.

Command Default There are no VLAN map entries and no VLAN maps applied to a VLAN.

Command Modes Global configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines In global configuration mode, use this command to create or modify a VLAN map. This entry changes the mode to VLAN access-map configuration, where you can use the **match** access-map configuration command to specify the access lists for IP or non-IP traffic to match and use the **action** command to set whether a match causes the packet to be forwarded or dropped.

In VLAN access-map configuration mode, these commands are available:

- **action**—Sets the action to be taken (forward or drop).

- **default**—Sets a command to its defaults.

- **exit**—Exits from VLAN access-map configuration mode.

- **match**—Sets the values to match (IP address or MAC address).

- **no**—Negates a command or set its defaults.

When you do not specify an entry number (sequence number), it is added to the end of the map.

There can be only one VLAN map per VLAN and it is applied as packets are received by a VLAN.

You can use the **no vlan access-map** *name* [*number*] command with a sequence number to delete a single entry.

Use the **vlan filter** interface configuration command to apply a VLAN map to one or more VLANs.

For more information about VLAN map entries, see the software configuration guide for this release.

This example shows how to create a VLAN map named vac1 and apply matching conditions and actions to it. If no other entries already exist in the map, this will be entry 10.

```
Device(config)# vlan access-map vac1
Device(config-access-map)# match ip address acl1
Device(config-access-map)# action forward
```

This example shows how to delete VLAN map vac1:

```
Device(config)# no vlan access-map vac1
```

vlan encryption osen

To specify the VLAN that a client should use while choosing Online Subscription with Encryption (OSEN) encryption on a single SSID during the association and authentication process, use the **vlan encryption osen** command. To remove the VLAN id, use the **no** form of this command.

vlan-id *vlan-id* **encryption osen**

Syntax Description

vlan-id	VLAN identifier.

Command Default VLAN ID is not configured.

Command Modes Wireless Policy Configuration (config-wireless-policy)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

The following example shows how to configure a VLAN that a client should use when it chooses OSEN encryption on a single SSID during the association and authentication process:

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# wireless profile policy rr-xyz-policy-1
Device(config-wireless-policy)# vlan 10 encryption osen
```

vlan filter

To apply a VLAN map to one or more VLANs, use the **vlan filter** command in global configuration mode on the switch stack or on a standalone switch. To remove the map, use the **no** form of this command.

vlan filter *mapname* **vlan-list** {*list* | **all**}
no vlan filter *mapname* **vlan-list** {*list* | **all**}

Note	This command is not supported on switches running the LAN Base feature set.

Syntax Description	*mapname*	Name of the VLAN map entry.
	vlan-list	Specifies which VLANs to apply the map to.
	list	The list of one or more VLANs in the form tt, uu-vv, xx, yy-zz, where spaces around commas and dashes are optional. The range is 1 to 4094.
	all	Adds the map to all VLANs.

Command Default	There are no VLAN filters.
Command Modes	Global configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   To avoid accidentally dropping too many packets and disabling connectivity in the middle of the configuration process, we recommend that you completely define the VLAN access map before applying it to a VLAN.

For more information about VLAN map entries, see the software configuration guide for this release.

This example applies VLAN map entry map1 to VLANs 20 and 30:

```
Device(config)# vlan filter map1 vlan-list 20, 30
```

This example shows how to delete VLAN map entry mac1 from VLAN 20:

```
Device(config)# no vlan filter map1 vlan-list 20
```

You can verify your settings by entering the **show vlan filter** privileged EXEC command.

vlan group

To create or modify a VLAN group, use the **vlan group** command in global configuration mode. To remove a VLAN list from the VLAN group, use the **no** form of this command.

vlan group *group-name* **vlan-list** *vlan-list*
no vlan group *group-name* **vlan-list** *vlan-list*

Syntax Description		
	group-name	Name of the VLAN group. The group name may contain up to 32 characters and must begin with a letter.
	vlan-list *vlan-list*	Specifies one or more VLANs to be added to the VLAN group. The *vlan-list* argument can be a single VLAN ID, a list of VLAN IDs, or VLAN ID range. Multiple entries are separated by a hyphen (-) or a comma (,).

Command Default None

Command Modes Global configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines If the named VLAN group does not exist, the **vlan group** command creates the group and maps the specified VLAN list to the group. If the named VLAN group exists, the specified VLAN list is mapped to the group.

The **no** form of the **vlan group** command removes the specified VLAN list from the VLAN group. When you remove the last VLAN from the VLAN group, the VLAN group is deleted.

A maximum of 100 VLAN groups can be configured, and a maximum of 4094 VLANs can be mapped to a VLAN group.

This example shows how to map VLANs 7 through 9 and 11 to a VLAN group:

```
Device(config)# vlan group group1 vlan-list 7-9,11
```

This example shows how to remove VLAN 7 from the VLAN group:

```
Device(config)# no vlan group group1 vlan-list 7
```

vlan-id

To configure a FlexConnect profile VLAN ID, use the **vlan-id** command. To remove the FlexConnect profile VLAN ID, use the **no** form of this command.

vlan-id *vlan-id*

Syntax Description	*vlan-id*	VLAN identifier.

Command Default VLAN ID is not configured.

Command Modes Wireless Flex Profile VLAN Configuration (config-wireless-flex-profile-vlan)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

The following example shows how to configure a flex profile VLAN ID:

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# wireless profile flex default-flex-profile
Device(config-wireless-flex-profile)# vlan-name test
Device(config-wireless-flex-profile-vlan)#vlan-id 12
```

vlan-name

To configure a FlexConnect profile VLAN, use the **vlan-name** command. To remove the FlexConnect profile VLAN, use the **no** form of this command.

vlan-name

Syntax Description	This command has no keywords or arguments.

Command Default   VLAN is not configured.

Command Modes   Wireless Flex Profile Configuration (config-wireless-flex-profile)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

The following example shows how to configure a FlexConnect profile VLAN:

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# wireless profile flex default-flex-profile
Device(config-wireless-flex-profile)# vlan-name test
```

vrf

To enable the virtual routing and forwarding (VRF) label, use the **vrf** command. To remove the VRF label, use the **no** form of this command.

vrf *vrf-name*

no vrf

Syntax Description

vrf-name	Name of the VRF.

Command Default   VRF label is not enabled.

Command Modes   SD Service Controller Configuration (config-sd-service-controller)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Examples

The following example shows how to enable VRF label:

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# avc sd-service
Device(config-sd-service)# controller
Device(config-sd-service-controller)# vrf doc-test
```

wan-metrics

To configure Hotspot 2.0 WAN metrics, use the **wan-metrics** command. Use the **no** form of the command to remove the WAN.

wan-metrics
{downlink-load | downlink-speed | full-capacity-link | link-status {down | not-configured | test-state | up} | load-measurement-duration | uplink-load | uplink-speed}

Syntax Description		
downlink-load	Sets the WAN downlink load. Valid range is from 0-255. Values are scaled linearly with 255 representing 100 percent.	
downlink-speed	Sets the WAN downlink speed, in kbps. Valid range is from 0-4294967295.	
full-capacity-link	Operates WAN link at its maximum capacity.	
link-status	Sets the WAN link status. Options are: • **down**: Link down • **not-configured**: Link is not configured. • **test-state**: Link is in test state. • **up**: Link is up.	
load-measurement-duration	Sets the duration of the uplink or downlink load measurement. Valid range is from 0-65535.	
uplink-load	Sets the WAN uplink load. Valid range is from 0-255. Values are scaled linearly with 255 representing 100 percent.	
uplink-speed	Sets the WAN uplink speed, in kbps. Valid range is from 0-4294967295.	

Command Default   None

Command Modes   Wireless ANQP Server Configuration (config-wireless-anqp-server)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure Hotspot 2.0 WAN uplink speed:

```
Device(config)# wireless hotspot anqp-server my-server
Device(config-wireless-anqp-server)# wan-metrics uplink-load 23
```

webauth-http-enable

To enable HTTP server for web authentication in the global parameter-map parameters mode, use the **webauth-http-enable**. Use the **no** form of the command to disable the command.

webauth-http-enable

no webauth-http-enable

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Global parameter-map mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

This example shows how to enable HTTP server for web authentication:

```
Device(config-params-parameter-map)# webauth-http-enable
```

wgb broadcast-tagging

To configure WGB broadcast tagging for a wireless policy profile, use the **wgb broadcast-tagging** command.

wgb   broadcast-tagging

Command Default	None
Command Modes	config-wireless-policy

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to enable WGB broadcast tagging for a wireless policy profile:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy profile-policy-name
Device(config-wireless-policy)# wgb broadcast-tagging
```

wgb vlan

To configure WGB VLAN client support for a WLAN policy profile, use the **wgb vlan** command.

wgb vlan

Command Default None

Command Modes config-wireless-policy

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to enable WGB VLAN client support for the WLAN policy profile named *wlan1-policy-profile*:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy wlan1-policy-profile
Device(config-wireless-policy)# wgb vlan
```

whitelist acl

To configure the whitelist ACL, use the **whitelist acl** command.

whitelist acl {*standard_acl_value* | *extended_acl_value* | *acl_name*}

Syntax Description	*standard_acl_value* Specifies the standard access list. Range is from 1 to 199.
	extended_acl_value Specifies the extended access list. Range is from 1300 to 2699.
	acl_name Specifies the named access list.

Command Default   None

Command Modes   ET-Analytics configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to enable in-active timer in the ET-Analytics configuration mode:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# et-analytics
Device(config-et-analytics)# whitelist acl
eta-whitelist
Device((config-et-analytics)# ip access-list
extended eta-whitelist
Device(config-ext-nacl)# permit udp any any eq tftp
Device(config-ext-nacl)# end
```

wired-vlan-range

To configure wired VLANs on which mDNS service discovery should take place, use the **wired-vlan-range** command. To disable the command, use the **no** form of this command.

wired-vlan-range   *wired-vlan-range-value*

Syntax Description	**wired-vlan-range**	Configures wired VLANs on which mDNS service discovery should take place.
	wired-vlan-range-value	Specifies the wired VLAN range value.

Command Default   None

Command Modes   mDNS flex profile configuration

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Examples   The following example shows how to configure wired VLANs on which mDNS service discovery should take place:

```
Device(config-mdns-flex-prof)# wired-vlan-range range-value
```

config wlan assisted-roaming

To configure assisted roaming on a WLAN, use the **config wlan assisted-roaming** command.

config wlan assisted-roaming {**neighbor-list** | **dual-list** | **prediction**} {**enable** | **disable**} *wlan_id*

Syntax Description	**neighbor-list**
	Configures an 802.11k neighbor list for a WLAN.
	dual-list	Configures a dual band 802.11k neighbor list for a WLAN. The default is the band that the client is currently associated with.
	prediction	Configures an assisted roaming optimization prediction for a WLAN.
	enable	Enables the configuration on the WLAN.
	disable	Disables the configuration on the WLAN.
	wlan_id	Wireless LAN identifier between 1 and 512 (inclusive).

Command Default   The 802.11k neighbor list is enabled for all WLANs.

By default, dual band list is enabled if the neighbor list feature is enabled for the WLAN.

Usage Guidelines   When you enable the assisted roaming prediction list, a warning appears and load balancing is disabled for the WLAN, if load balancing is already enabled on the WLAN.

The following example shows how to enable an 802.11k neighbor list for a WLAN:

```
(Cisco Controller) >config wlan assisted-roaming neighbor-list enable 1
```

wireless aaa policy

To configure a wireless AAA policy, use the **wireless aaa policy** command.

wireless aaa policy *aaa-policy*

Syntax Description

aaa-policy	Name of the wireless AAA policy.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure a wireless AAA policy named *aaa-policy-test*

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless aaa policy aaa-policy-test
```

wireless aaa policy

To configure a new AAA policy, use the **wireless aaa policy** command.

wireless aaa policy *aaa-policy-name*

Syntax Description

aaa-policy-name	AAA policy name.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure a AAA policy name:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless aaa policy my-aaa-policy
```

wireless autoqos policy-profile

To enable the **autoqos** wireless policy with an executable command, use the autoqos command. Use the **disable** command to disable wireless AutoQos.

wireless autoqos policy-profile*policy-profile-name* **default_policy_profile mode** { **clear** | **enterprise-avc** | **fastlane** | **guest** | **voice** }

wireless autoqos disable

Syntax Description		
autoqos	Configures wireless Auto QoS.	
mode	Specifies the wireless AutoQoS mode.	
enterprise-avc	Enables AutoQos wireless enterprise AVC policy.	
clear	Clears the configured wireless policy.	
fastlane	Enables the AutoQos fastlane policy. This will disable and enable the 2.4GHz or 5GHz 802.11 network.	
guest	Enables AutoQos wireless guest policy.	
voice	Enables AutoQos wireless voice policy. This will disable and enable the 2.4GHz or 5GHz 802.11 network.	

Command Default None

Command Modes Privilege EXEC mode

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.2s	This command was introduced.

Example

This example shows how to enable AutoQoS wireless enterprise policy:

```
Device# wireless autoqos policy-profile default-policy-profile mode enterprise-avc
```

wireless broadcast vlan

To enable broadcast support on a VLAN, use the **wireless broadcast vlan** command in global configuration mode. To disable Ethernet broadcast support, use the **no** form of the command.

wireless broadcast vlan [*vlan-id*]
no wireless broadcast vlan [*vlan-id*]

Syntax Description	*vlan-id* (Optional) Specifies the VLAN ID to enable broadcast support to that VLAN. The value ranges from 1 to 4095.

Command Default None

Command Modes Global configuration mode

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines Use this command in the global configuration mode only.

This example shows how to enable broadcasting on VLAN 20:

```
Device(config)# wireless broadcast vlan 20
```

wireless client

To configure client parameters, use the **wireless client** command in global configuration mode.

wireless client {**association limit** *assoc-number* **interval** *interval* | **band-select** {**client-mid-rssi** *rssi* | **client-rssi** *rssi* | **cycle-count** *count* | **cycle-threshold** *threshold* | **expire dual-band** *timeout* | **expire suppression** *timeout*} | **fast-ssid-change** | **max-user-login** *max-user-login* | **notification** {**interval** *time* | **join-failure aaathreshold***percentage* | **roam-failure threshold** *percentage*} | **timers auth-timeout** *seconds* | **user-timeout** *user-timeout*}

Syntax Description	**association limit** *assoc-number* **interval** *interval*	Enables association request limit per access point slot at a given interval and configures the association request limit interval.
		You can configure number of association request per access point slot at a given interval from one through 100.
		You can configure client association request limit interval from 100 through 10000 milliseconds.
	band-select	Configures the band select options for the client.
	client-mid-rssi *rssi*	Sets the client mid-rssi threshold for band select.
		The minimum dBm of a client RSSI to respond to probe is between -90 and -20.
	client-rssi *rssi*	Sets the client received signal strength indicator (RSSI) threshold for band select.
		The minimum dBm of a client RSSI to respond to probe is between -90 and -20.
	cycle-count *count*	Sets the band select probe cycle count.
		You can configure the cycle count from 1 to 10.
	cycle-threshold *threshold*	Sets the time threshold for a new scanning cycle.
		You can configure the cycle threshold from 1 to 1000 milliseconds.
	expire dual-band *timeout*	Sets the timeout before stopping to try to push a given client to the 5-GHz band.
		You can configure the timeout from 10 to 300 seconds, and the default value is 60 seconds.
	expire suppression *timeout*	Sets the expiration time for pruning previously known dual-band clients.
		You can configure the suppression from 10 to 200 seconds, and the default timeout value is 20 seconds.
	fast-ssid-change	Enables the fast SSID change for mobile stations.
	max-user-login *max-user-login*	Configures the maximum number of login sessions for a user.

notification	Configures notifications.
interval *time*	Configures notifications for an interval.
	The valid time ranges from 1 to 1440 seconds.
join-failure aaa threshold *percentage*	Configures notifications for client join failures.
	You can configure the threshold percentage to trigger an alert. The valid threshold percentage ranges from 1 to 100.
roam-failure threshold *percentage*	Configures notifications for client roam failures.
	You can configure the threshold for notifications. The valid threshold percentage ranges from 1 to 100.
timers auth-timeout *seconds*	Configures the client timers.
user-timeout *user-timeout*	Configures the idle client timeout.

Command Default No default behavior or values.

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
Cisco IOS XE Gibraltar 16.10.1	This command was modified. The **client-mid-rssi, notification**, and **fast-ssid-change** keywords were added. The **user-timeout** keyword was deleted.

This example shows how to set the proble cycle count for band select to 8:

```
Device# configure terminal
Device(config)# wireless client band-select cycle-count 8
Device(config)# end
```

This example shows how to set the time threshold for a new scanning cycle with threshold value of 700 milliseconds:

```
Device# configure terminal
Device(config)# wireless client band-select cycle-threshold 700
Device(config)# end
```

This example shows how to suppress dual-band clients from the dual-band database after 70 seconds:

```
Device# configure terminal
Device(config)# wireless client band-select expire suppression 70
Device(config)# end
```

wireless client client-steering client-count

To set the minimum number of clients for client steering on the wireless client, use the **wireless client client-steering client-count** command. Use the **no** form of this command to disable the feature.

wireless client client-steering client-count   *0-200*

no wireless client client-steering client-count

Syntax Description	*0-200*	Specifies the minimum number of clients for client steering. The value range is from 0 to 200 clients. The default value is three clients.

Command Default   None

Command Modes   Global configuration mode

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Example

The following example shows how to set the minimum number of clients for client steering:

```
Device(config)# wireless client client-steering client-count 25
```

wireless client client-steering min-rssi-24ghz

To set the minimum RSSI threshold value for client steering in 2.4-Ghz, use the **wireless client client-steering min-rssi-24ghz -70** command. Use the **no** form of this command to disable the feature.

wireless client client-steering min-rssi-24ghz -70

no wireless client client-steering min-rssi-24ghz -70

Syntax Description	**-70**	Specifies the minimum RSSI threshold value for client steering in 2.4-GHz.

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Example

The following example shows how to set the minimum RSSI threshold value for client steering in 2.4-Ghz:

```
Device(config)# wireless client client-steering min-rssi-24ghz -70
```

wireless client client-steering min-rssi-5ghz

To set the minimum RSSI threshold value for client steering in 5-Ghz, use the **wireless client client-steering min-rssi-5ghz** command. Use the **no** form of this command to disable the feature.

wireless client client-steering min-rssi-5ghz -75

no wireless client client-steering min-rssi-5ghz -75

Syntax Description	**-75**	Specifies the minimum RSSI threshold value for client steering in 5-GHz.

Command Default   None

Command Modes   Global configuration mode

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Example

The following example shows how to set the minimum RSSI threshold value for client steering in 5-Ghz:

```
Device(config)# wireless client client-steering min-rssi-5ghz -75
```

wireless client client-steering util-threshold

To set the maximum utilization difference for client steering, use the **wireless client client-steering util-threshold** command. Use the **no** form of this command to disable the feature.

wireless client client-steering util-threshold   *0-100*

no wireless client client-steering util-threshold

Syntax Description	*0-100* Specifies the maximum utilization difference for client steering. The value range is from 0 to 100 percentage. The default value is 20 percent.

Command Default	None

Command Modes	Global configuration mode

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Example

The following example shows how to set the maximum utilization difference for client steering:

```
Device(config)# wireless client client-steering util-threshold 20
```

wireless client client-steering window-size

To set the minimum window size for client steering on the wireless client, use the **wireless client client-steering window-size** command. Use the **no** form of this command to disable the feature.

wireless client client-steering window-size   *0-200*

no wireless client client-steering window-size

Syntax Description	*0-200*	Specifies the minimum client steering window size. The value range is from 0 to 200 clients. The default value is three.

Command Default   None

Command Modes   Global configuration mode

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Example

The following example shows how to set the minimum window size for client steering:

```
Device(config)# # wireless client client-steering window-size 25
```

wireless ipv6 client

To enable IPv6 for clients, use the **wireless ipv6 client** command. To disable IPv6 for clients, use the **no** form of the command.

wireless ipv6 client

no wireless ipv6 client

Syntax Description   This command has no keywords or arguments.

Command Default   IPv6 is enabled by default.

Command Modes   Global Config(config)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Usage Guidelines   All client IPv6 traffic is dropped for a client ingress and egress on the controller. Hence, limited to local mode only. If IPv6 is disabled, then client will not get an IPv6 address. The configuration impacts only clients that associate or join after the configuration changes are made. Existing clients are not impacted. The **wireless ipv6 client** command is applicable only for central switching clients.

Example

The following is an example of how to enable IPv6 for clients:

```
Device(config)# wireless ipv6 client
```

wireless client ip-address deauthenticate

To deauthenticate wirelesss clients deauthenticate wirelesss clients based on their IP address, use the **wireless client ip-address deauthenticate** command.

wireless client ip-address *ip-address* **deauthenticate**

Syntax Description

ip-address	Client IP address.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Examples   The following example shows how to deauthenticate wirelesss clients based on their IP address:

```
Device# wireless client ip-address 10.2.2.2 deauthenticate
```

wireless client mac-address

To configure the wireless client settings, use the **wireless client mac-address** command in global configuration mode.

wireless client mac-address *mac-addr* **ccx** {**clear-reports** | **clear-results** | **default-gw-ping** | **dhcp-test** | **dns-ping** | **dns-resolve hostname** *host-name* | **get-client-capability** | **get-manufacturer-info** | **get-operating-parameters** | **get-profiles** | **log-request** {**roam** | **rsna** | **syslog**} | **send-message** *message-id* | **stats-request** *measurement-duration* {**dot11** | **security**} | **test-abort** | **test-association** *ssid bssid dot11 channel* | **test-dot1x** [*profile-id*] *bssid dot11 channel* | **test-profile** {**any***profile-id*}}

Syntax Description

mac-addr	MAC address of the client.
ccx	Cisco client extension (CCX).
clear-reports	Clears the client reporting information.
clear-results	Clears the test results on the controller.
default-gw-ping	Sends a request to the client to perform the default gateway ping test.
dhcp-test	Sends a request to the client to perform the DHCP test.
dns-ping	Sends a request to the client to perform the Domain Name System (DNS) server IP address ping test.
dns-resolve hostname *host-name*	Sends a request to the client to perform the Domain Name System (DNS) resolution test to the specified hostname.
get-client-capability	Sends a request to the client to send its capability information.
get-manufacturer-info	Sends a request to the client to send the manufacturer's information.
get-operating-parameters	Sends a request to the client to send its current operating parameters.
get-profiles	Sends a request to the client to send its profiles.
log-request	Configures a CCX log request for a specified client device.
roam	(Optional) Specifies the request to specify the client CCX roaming log
rsna	(Optional) Specifies the request to specify the client CCX RSNA log.
syslog	(Optional) Specifies the request to specify the client CCX system log.

send-message *message-id*

Sends a message to the client.

Message type that involves one of the following:

- 1—The SSID is invalid
- 2—The network settings are invalid.
- 3—There is a WLAN credibility mismatch.
- 4—The user credentials are incorrect.
- 5—Please call support.
- 6—The problem is resolved.
- 7—The problem has not been resolved.
- 8—Please try again later.
- 9—Please correct the indicated problem.
- 10—Troubleshooting is refused by the network.
- 11—Retrieving client reports.
- 12—Retrieving client logs.
- 13—Retrieval complete.
- 14—Beginning association test.
- 15—Beginning DHCP test.
- 16—Beginning network connectivity test.
- 17—Beginning DNS ping test.
- 18—Beginning name resolution test.
- 19—Beginning 802.1X authentication test.
- 20—Redirecting client to a specific profile.
- 21—Test complete.
- 22—Test passed.
- 23—Test failed.
- 24—Cancel diagnostic channel operation or select a WLAN profile to resume normal operation.
- 25—Log retrieval refused by the client.
- 26—Client report retrieval refused by the client.
- 27—Test request refused by the client.
- 28—Invalid network (IP) setting.
- 29—There is a known outage or problem with the network.

	• 30—Scheduled maintenance period.
	• 31—The WLAN security method is not correct.
	• 32—The WLAN encryption method is not correct.
	• 33—The WLAN authentication method is not correct.

stats-request *measurement-duration*	Senda a request for statistics.
dot11	Optional) Specifies dot11 counters.
security	(Optional) Specifies security counters.
test-abort	Sends a request to the client to abort the current test.
test-association *ssid bssid dot11 channel*	Sends a request to the client to perform the association test.
test-dot1x	Sends a request to the client to perform the 802.1x test.
profile-id	(Optional) Test profile name.
bssid	Basic SSID.
dot11	Specifies the 802.11a, 802.11b, or 802.11g network.
channel	Channel number.
test-profile	Sends a request to the client to perform the profile redirect test.
any	Sends a request to the client to perform the profile redirect test.
profile-id	Test profile name.
	Note The profile ID should be from one of the client profiles for which client reporting is enabled.

Command Default   No default behavior or values.

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The **default-gw-ping** test does not require the client to use the diagnostic channel.

This example shows how to clear the reporting information of the client MAC address 00:1f:ca:cf:b6:60:

```
Device# configure terminal
```

```
Device(config)# wireless client mac-address 00:1f:ca:cf:b6:60 ccx clear-reports
Device(config)# end
```

wireless client syslog-detailed

To enable detailed syslogs for a client event, use the **wireless client syslog-detailed** command. To disable detailed syslogs for a client event, use the **no** form of this command.

wireless client syslog-detailed

no wireless client syslog-detailed

Syntax Description	This command has no keywords or arguments.

Command Default   None

Command Modes   Global configuration (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

The following example shows how to enable detailed syslogs for client events:

```
Device(config)# wireless client syslog-detailed
```

wireless client username deauthenticate

To deauthenticate wirelesss clients with a given username, use the **wireless client username deauthenticate** command.

wireless client username *username* **deauthenticate**

Syntax Description

username	Client username.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Examples   The following example shows how to deauthenticate wirelesss clients with a given username:

```
Device# wireless client username Bob deauthenticate
```

wireless client vlan-persistent

To enable client roaming across different policy profiles, use the **wireless client vlan-persistent** command.

wireless client vlan-persistent

no wireless client vlan-persistent

Syntax Description	This command has no keywords or arguments.

Command Default   None

Command Modes   Global Configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Examples   The following example shows how to enable client roaming across different policy profiles:

```
Device(config) # wireless client vlan-persistent
```

wireless config validate

To validate whether the wireless configuration is complete and consistent (all the functional profiles and tags are defined, and all the associations are complete and consistent), use the **wireless config validate** command in privileged EXEC mode.

wireless config validate

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

In Cisco vEWLC, the wireless configuration is built using a collection of profiles, with each profile defining a functional block. These functional blocks are defined independently and is used to realize well-defined associations through intent based work-flows in building the wireless LAN. Such flexibility of modularizing the functional blocks requires the administrator to ensure that all associations are consistent and complete.

To ensure completeness and consistency of the wireless configuration, a configuration validation library is used to validate the configuration definitions across tables. The **wireless config validate** exec command is introduced from this release to validate the wireless configuration and report inconsistencies, if any, using contextual error message that is visible in btrace infra and on the console (if console logging is enabled). This command calls out any inconsistencies (unresolved associations) enabling you to realize a functional wireless LAN.

Use the following command to direct the output to a file: **show logging | redirect bootflash:** *filename* .

The following set of wireless configurations are validated:

RF tag	Site tag	Policy tag	Policy profile	Flex profile
site-tag	flex-profile	wlan profile	IPv4 ACL name	VLAN ACL
poliy-tag	ap-profile	policy profile	Fabric name	ACL-policy
rf-tag	——	——	service-policy input and output name	RF Policy (5GHz and 24GHz)
——	——	——	service-policy input and client output name	——

Example

The following is sample output from the **wireless config validate** command

```
Device# wireless config validate

Oct 10 18:21:59.576 IST: %CONFIG_VALIDATOR_MESSAGE-5-EWLC_GEN_ERR: Chassis 1 R0/0: wncmgrd:
 Error in AP: fc99.473e.0a90  Applied site-tag : mysite definitiondoes not exist
Oct 10 18:21:59.576 IST: %CONFIG_VALIDATOR_MESSAGE-5-EWLC_GEN_ERR: Chassis 1 R0/0: wncmgrd:
 Error in AP: fc99.473e.0a90  Applied policy-tag : mypolicy definition does not exist
Oct 10 18:21:59.576 IST: %CONFIG_VALIDATOR_MESSAGE-5-EWLC_GEN_ERR: Chassis 1 R0/0: wncmgrd:
 Error in AP: fc99.473e.0a90  Applied rf-tag : myrf definition does not exist
```

wireless country

To configure one or more country codes for a device, use the **wireless country** command.

wireless **country** *country-code*

Syntax Description

country-code	Two-letter country code.

Command Default None

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Usage Guidelines The Cisco must be installed by a network administrator or qualified IT professional and the installer must select the proper country code. Following installation, access to the unit should be password protected by the installer to maintain compliance with regulatory requirements and to ensure proper unit functionality. See the related product guide for the most recent country codes and regulatory domains.

This example shows how to configure country code on the device to IN (India):

```
Device(config)# wireless country IN
```

wireless exclusionlist mac address

To manually add clients to the exclusionlist, use the wireless exclusion list command. To remove the manual entry, use the no form of the command.

wireless exclusionlist *mac_address* **description**

Syntax Description	**description** *value*	Configures the entry description.

Command Default   None

Command Modes   Global Configuration

Command History

Cisco IOS XE Gibraltar 16.10.1	**Modification**
	This command was introduced in this release.

Usage Guidelines   If a client was added to the exclusion list dynamically, the command to remove it is **wireless client mac-address xxxx.xxxx.xxxx deauthenticate** from enable mode.

Example

This example shows how to manage exclusion entries:

```
Device(config)# wireless exclusion list xxxx.xxxx.xxxx
```

wireless fabric control-plane

To configure a control plane name applicable to the wireless fabric mode, use the **wireless fabric control-plane** command.

wireless fabric control-plane *control-plane-name*

Syntax Description

control-plane-name	Control plane name that is applicable to the wireless fabric mode.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines

If you do not provide a control plane name, the default-control-plane, which is auto-generated, is used.

Examples

The following example shows how to configure a control plane name:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless fabric control-plane test-control-plane
```

wireless fabric

To enable SD-Access Wireless globally on the controller, use the **wireless fabric** command.

wireless fabric

Command Default None

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to enable SD-Access wireless globally on the controller:

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

wireless fabric name

To configure wireless fabric name VXLAN ID (VNID) map, use the **wireless fabric name** command.

wireless fabric [**control-plane** *control-plane-name*] | [**name** *vnid-map-name* **l2-vnid** *id* {**control-plane** *control-plane-name* | **l3-vnid** *id* } **ip** {*ipv-addr netmask-addr* | *ipv6-addr netmask-addr*}[{**control-plane** *control-plane-name*]}]

Syntax Description	**control-plane** *control-plane-name*	Configure the control plane details.
	name *vnid-map-name*	Configure the wireless fabric name
	l2-vnid *id*	Configure the Layer 2 VNID. Valid range is 0 to 16777215.
	l3-vnid *id*	Configure the Layer 3 VNID. Valid range is 0 to 16777215.
	ip {*ipv4-addr netmask-addr* | *ipv6-addr netmask-addr*}	IP address and netmask address details.

Command Default	None
Command Modes	Global configuration (config)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure MAP server per VNID for Layer 2 and Layer 3:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless fabric name vnid-map l2-vnid 2 l3-vnid 10 ip 209.165.200.224
255.255.255.224
```

wireless hotspot anqp-server

To configure a wireless Hotspot 2.0 Access Network Query Protocol (ANQP) server, use the **wireless hotspot anqp-server** command. To disable the Hotspot 2.0 server, use the **no** form of the command.

wireless hotspot anqp-server *server-name*

wireless hotspot anqp-server *server-name* **type** **open-roaming**

Syntax Description	*server-name*	Name of the Hotspot 2.0 ANQP server.
	type	ANQP server type.
	open-roaming	Open roaming type.

Command Default   None

Command Modes   Global Configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.
Cisco IOS XE Amsterdam 17.2.1	This command was modified. The **type** and **open-roaming** keywords were introduced.

Example

The following example shows how to configure a Hotspot 2.0 ANQP server:

```
Device(config)# wireless hotspot anqp-server my-server
```

The following example shows how to configure a Hotspot 2.0 ANQP server with open roaming:

```
Device(config)# wireless hotspot anqp-server my-server type open-roaming
```

wireless hotspot gas-rate-limit

To limit the maximum number of Generic Advertisement Services (GAS) or Access Network Query Protocol (ANQP) requests processed per second, use the **wireless hotspot gas-rate-limit** command. To disable the limit, use the **no** form of the command.

wireless hotspot gas-rate-limit *limit*

Syntax Description	*limit* Number of GAS or ANQP requests to process, per second. Valid range is from 1-2500.

Command Default   None

Command Modes   Global Configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to limit the maximum number of GAS or ANQP requests processed per second:

```
Device(config)# wireless hotspot gas-rate-limit 100
```

wireless hotspot icon

To configure an icon for Hotspot 2.0, use the **wireless hotspot icon** command. To remove the icon, use the **no** form of the command.

wireless hotspot icon {**bootflash:filename** | **flash:filename**} *media-type language-code icon-width icon-height*

Syntax Description	*media-type*	Media type for this icon file.
		Note The icon file should match the types defined in:
		http://www.iana.org/assignments/media-types/index.html
	language-code	A three character language code for the operator. Use only the first three letters of the language, in lower case, for the language code. For example, use *eng* for English.
		To see the full list of language codes, go to: http://www.loc.gov/standards/iso639-2/php/code_list.php.
	icon-width	Icon width, in pixels. Valid range is from 0-65535.
	icon-height	Icon height, in pixels. Valid range is from 0-65535.

Command Default	None

Command Modes	Global Configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to configure an icon for Hotspot 2.0:

```
Device(config)# wireless hotspot icon flash:test jpeg en 655 400
```

wireless ipv6 nd ns-forward

To enable the forwarding of neighbor solicitation (NS) message to wireless clients, use the **wireless ipv6 nd ns-forward** command. To disable the feature, use the **no** form of this command.

wireless ipv6 nd ns-forward

no wireless ipv6 nd ns-forward

Syntax Description	This command has no arguments or keywords.
Command Default	None
Command Modes	Global configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Cupertino 17.9.2	This command is supported from Cisco IOS XE Cupertino 17.9.2 onwards.

Example

The following example shows how to enable the forwarding of neighbor solicitation (NS) message to wireless clients:

```
Device(config)# wireless ipv6 nd ns-forward
```

wireless ipv6 ra wired

To enable the forwarding of Router Advertisement message to the wired clients, use the **wireless ipv6 ra wired** command.

wireless ipv6 ra wired { **nd** { **na-forward** | **ns-forward** } | **ra-wired** }

Syntax Description	*nd*	Configures wireless IPv6 ND parameters.
	na-forward	Enables forwarding of Neighbor Advertisement to wireless clients.
	ns-forward	Enable forwarding of Neighbor Solicitation to wireless clients.
	ra	Configures wireless IPv6 Router Advertisement parameters.
	wired	Enables forwarding of Router Advertisement message to the wired clients.

Command Default	None
Command Modes	Global Configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.12.3	This command was introduced.

Example

The following example shows how to enable the forwarding of Router Advertisement message to the wired clients:

```
Device(config)# wireless ipv6 ra wired
```

Warning   The **wireless ipv6 ra wired** command must be enabled only for certification purpose and not during the deployment.

wireless load-balancing

To globally configure aggressive load balancing on the controller, use the **wireless load-balancing** command in global configuration mode.

wireless load-balancing {**denial** *denial-count* | **window** *client-count*}

Syntax Description	**denial** *denial-count*	Specifies the number of association denials during load balancing.
		Maximum number of association denials during load balancing is from 1 to 10 and the default value is 3.
	window *client-count*	Specifies the aggressive load balancing client window, with the number of clients needed to trigger aggressive load balancing on a given access point.
		Aggressive load balancing client window with the number of clients is from 0 to 20 and the default value is 5.

Command Default	Disabled.

Command Modes	Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

Load-balancing-enabled WLANs do not support time-sensitive applications like voice and video because of roaming delays.

When you use Cisco 7921 and 7920 Wireless IP Phones with controllers, make sure that aggressive load balancing is disabled on the voice WLANs for each controller. Otherwise, the initial roam attempt by the phone might fail, causing a disruption in the audio path.

This example shows how to configure association denials during load balancing:

```
Device# configure terminal
Device(config)# wireless load-balancing denial 5
Device(config)# end
```

wireless macro-micro steering transition-threshold

To configure micro-macro transition thresholds, use the **wireless macro-micro steering transition-threshold** command.

wireless macro-micro steering transition-threshold {**balancing-window** | **client count** *number-clients* } {**macro-to-micro** | **micro-to-macro** *RSSI in dBm*}

Syntax Description		
	balancing-window	Active instance of the configuration in Route-processor slot 0.
	client	Standby instance of the configuration in Route-processor slot 0.
	number-clients	Valid range is 0 to 65535 clients.
	macro-to-micro	Configures the macro to micro transition RSSI.
	micro-to-macro	Configures micro-macro client load balancing window.
	RSSI in dBm	RSSI in dBm. Valid range is −128 to 0.

Command Default	None

Command Modes	Global configuration (config)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure balancing-window:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless macro-micro steering transition-threshold balancing-window
number-of-clients
```

wireless macro-micro steering probe-suppression

To configure micro-macro probe suppressions, use the **wireless macro-micro steering probe-suppression** command.

wireless macro-micro steering probe-suppression {**aggressiveness** *number-of-cycles* | | **hysteresis***RSSI in dBm* | **probe-auth** | **probe-only**}

Syntax Description		
aggressiveness	Configures probe cycles to be suppressed. The number of cycles range between 0 - 255.	
hysteresis	Indicate show much greater the signal strength of a neighboring access point must be in order for the client to roam to it. The RSSI decibel value ranges from -6 to -3.	
probe-auth	Enables mode to suppress probes and single auth	
probe-only	Enables mode to suppress only probes	

Command Default None

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.12.1.

Examples

The following example shows how to configure balancing-window:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless macro-micro steering probe-suppression aggressiveness
number-of-cycles
```

wireless management certificate

To create a wireless management certificate details, use the **wireless management certificate** command.

wireless management certificate ssc {**auth-token** {**0** | **8**} *token* | **trust-hash** *hash-key* }

Syntax Description	**auth-token**	Authentication token.
	token	Token name.
	trust-hash	Trusted SSC hash list.
	hash-key	SHA1 fingerprint.
	0	Specifies an UNENCRYPTED token.
	8	Specifies an AES encrypted token.

Command Default	None

Command Modes	Global Configuration(config)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Example

The following example shows how to configure a wireless management certificate:

```
Device# configure terminal
Device(config)# wireless management certificate ssc trust-hash test
```

wireless management interface

To create a wireless management interface, use the **wireless management interface** command.

wireless management interface { **GigabitEthernet** | **Loopback** | **Vlan** } *interface-number*

Syntax Description

interface-number	Interface number.

Command Default   None

Command Modes   Global Configuration(config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Example

The following example shows how to configure a wireless management interface:

```
Device# configure terminal
Device(config)# wireless management interface vlan vlan1
```

wireless management trustpoint

To create a wireless management trustpoint, use the **wireless management trustpoint** command.

wireless management trustpoint *trustpoint-name*

Syntax Description	*trustpoint-name*	Trustpoint name.

Command Default   None

Command Modes   Global Configuration(config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines   Use this command only on the Cisco Catalyst 9800 Wireless Controller for Cloud platform and not on appliances as the appliances use the SUDI certificate by default without the need for this command.

Example

The following example shows how to configure a wireless management trustpoint:

```
Device# configure terminal
Device(config)# wireless management trustpoint test
```

wireless max-warning period

To configure the periodicity of a wireless client check, use the **wireless max-warning period** command. To disable wireless client check, use the **no** form of this command.

wireless max-warning period *interval-in-mins*

no wireless max-warning period

Syntax Description

interval-in-mins	Wireless client check periodicity. Valid values range from 1 to 60 minutes.

Command Default

Wireless client check periodicity is not set.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Examples

The following example shows how to configure the periodicity of a wireless client check:

```
Device# configure terminal
Device(config)# wireless max-warning period 20
```

wireless max-warning threshold clients

To configure the warning threshold percentage for the maximum number of wireless clients in a wireless client check, use the **wireless max-warning threshold client** command. To revert to the default values of a wireless client check, use the **no** form of this command.

wireless max-warning threshold clients *threshold_percentage*

no wireless max-warning threshold clients

Syntax Description	*threshold_percentage*	Wireless client check warning threshold percentage. Valid values range from 50 to 100 percent.

Command Default   Threshold percent is set at 75 percent.

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Examples   The following example shows how to configure the warning threshold percentage for the maximum number of wireless clients in a wireless client check:

```
Device# configure terminal
Device(config)# wireless max-warning threshold clients 90
```

wireless media-stream

To configure various parameters, use the **wireless media-stream** command.

wireless media-stream group *groupName* [*startipAddr endipAddr*]

wireless media-stream group { avg-packet-size default exit max-bandwidth no policy qos}

wireless media-stream {**multicast-direct** | **message** [**phone** *phone* | **URL** *URL* | **Notes** *Notes* | **Email** *Email*]}

Syntax Description		
group *groupName*	Configure multicast-direct status for a group.
startipAddr	Specifies the start IP Address for the group.
endipAddr	Specifies the End IP Address for the group.
group *avg-packet-size*	Configure average packet size. The values can range between 100 to 1500.
group *default*	Set a command to its defaults.
group *exit*	Exit sub-mode.
group *max-bandwidth*	Configure maximum expected stream bandwidth in Kbps. The values can range between 1 to 35000 kbps.
group *no*	Negate a command or set its defaults.
group *policy*	Configure media stream admission policy. You can choose either of these options: • admit - Allow traffic for the media stream group. • deny - Deny traffic for the media stream group.
group *qos*	Configure over the air QoS class, <'video'> ONLY.
multicast-direct	Configure multicast-direct status.
message	Configure Session Announcement Message.
phone *phone*	Configure Session Announcement Phone number.
URL *URL*	Configure Session Announcement URL.
Notes *Notes*	Configure Session Announcement notes.
Email *Email*	Configure Session Announcement Email.

Command Default   Disabled

Command Modes   config

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was modified.

Usage Guidelines   Media-stream multicast-direct requires load-based Call Admission Control (CAC) to run.

Examples

The following example shows how to configure each media stream and its parameters like expected multicast destination addresses, stream bandwidth consumption and stream priority parameters.

```
Device#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)#wireless media-stream group GROUP1 231.1.1.1 231.1.1.10
```

wireless media-stream message

To configure session announcement message, use the **wireless media-stream message** command.

wireless media-stream message {**Email** | **Notes** | **URL** | **phone**}

Syntax Description	**Email**	Configure session announcement e-mail.
	Notes	Configure session announcement notes.
	URL	Configure session announcement URL.
	phone	Configure session announcement phone number.

Command Default None

Command Modes Global configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines When a media stream is refused (due to bandwidth constraints), a message can be sent to the user. These parameters configure the messages to send IT support e-mail address, notes (message to display explaining why the stream was refused), URL to which the user can be redirected to and the phone number that the user can call about the refused stream.

Examples

The following example shows how to configure a session announcement URL:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless media-stream message URL www.example.com
```

wireless media-stream multicast-direct

To configure multicast-direct status, use the **media-stream multicast-direct** command. To remove the multicast-direct status, use the no form of the command.

no wireless media-stream multicast-direct

Command Default None

Command Modes config

Usage Guidelines Media stream multicast-direct requires load based Call Admission Control (CAC) to run. WLAN quality of service (QoS) needs to be set to either gold or platinum.

Examples

The following example shows how to configure multicast-direct for a wireless LAN media stream.

```
Device#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)#wireless media-stream multicast-direct
```

wireless mesh alarm association count

To configure the mesh alarm association count, use the **wireless mesh alarm association count** command.

wireless mesh alarm association count *count*

Syntax Description

count	Number of alarm associations. The vlaid range is between 1 and 30.

Command Default   None

Command Modes   config

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the mesh alarm association count:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy wireless mesh alarm association count 10
```

wireless mesh alarm high-snr

To configure the mesh alarm high-snr value, use the **wireless mesh alarm high-snr** command.

wireless mesh alarm high-snr *high-snr*

Syntax Description

high-snr	Set the high-snr value. The valid range is between 31 and 100.

Command Default None

Command Modes config

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the mesh high-snr:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy wireless mesh alarm high-snr 75
```

wireless mesh alarm low-snr

To configure the mesh alarm low-snr value, use the **wireless mesh alarm low-snr** command.

wireless mesh alarm low-snr *low-snr*

Syntax Description

low-snr	Set the low-snr value. The valid range is between 1 and 30.

Command Default None

Command Modes config

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the mesh high-snr:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile policy wireless mesh alarm low-snr 5
```

wireless mesh alarm max-children map

To configure the mesh alarm max-children map value, use the **wireless mesh alarm max-children map** command.

wireless mesh alarm max-children map *max-children*

Syntax Description | *max-children* | Set the mesh alarm max-children map parameter. The valid range is between 1 and 50. |

Command Default None

Command Modes config

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the mesh alarm max-children map value:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless mesh alarm max-children map 35
```

wireless mesh alarm max-children rap

To configure the mesh alarm max-children rap value, use the **wireless mesh alarm max-children rap** command.

wireless mesh alarm max-children rap *max-children*

Syntax Description	*max-children* Set the mesh alarm max-children rap parameter. The valid range is between 1 and 50.

Command Default None

Command Modes config

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the mesh alarm max-children rap value:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless mesh alarm max-children rap 40
```

wireless mesh alarm max-hop

To configure the mesh alarm max-hop paramter, use the **wireless mesh alarm max-hop** command.

wireless mesh alarm max-hop *max-hop*

Syntax Description

max-hop	Set the mesh alarm max-hop count. Valid range is between 1 and 16.

Command Default   None

Command Modes   config

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the mesh alarm max-hop parameter:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless mesh alarm max-hop 15
```

wireless mesh alarm parent-change count

To configure the max parent-change count value, use the **wireless mesh alarm parent-change count** command.

wireless mesh alarm parent-change count *count*

Syntax Description	*count* Set the max parent-change count value. Valid range is between 1 and 30.

Command Default None

Command Modes config

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the alarm parent change count value:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless mesh alarm parent-change count 6
```

wireless mesh backhaul bdomain-channels

To configure and allow the Extended UNII B Domain channels for Outdoor mesh APs backhaul radio, use the **wireless mesh backhaul bdomain-channels** command.

wireless mesh backhaul bdomain-channels

Syntax Description	**bdomain-channels** Allows the Extended UNII B Domain channels for Outdoor mesh APs backhaul radio.
	The **[no]** form of the command disables the use of the Extended UNII B Domain channels by the mesh APs backhaul radio.

Command Default   None

Command Modes   config

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to disable the use of Extended UNII B Domain channels by the Outdoor mesh APs backhaul radio:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# no wireless mesh backhaul bdomain-channels
```

wireless mesh backhaul rrm

To configure the mesh backhaul, use the **wireless mesh backhaul** command.

wireless mesh backhaul {**bdomain-channels** | **rrm**}

Syntax Description	
backhaul	Configures the Mesh Backhaul.
bdomain-channels	Allows Extended UNII B Domain channels for Outdoor mesh APs backhaul radio.
rrm	Configures RRM for the mesh backhaul.

Command Default   None

Command Modes   config

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure RRM for the mesh backhaul:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless mesh backhaul rrm
```

wireless mesh backhaul rrm auto-dca

To configure auto DCA for radio frequency (RF) Application Specific Integrated Circuit (ASIC) RAPs, use the **wireless mesh backhaul rrm auto-dca** command.

wireless mesh backhaul rrm auto-dca

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

This example shows how to configure auto DCA for RF ASIC integrated RAPs:

```
Device# wireless mesh backhaul rrm auto-dca
```

wireless mesh cac

To configure the mesh CAC Mode, use the **wireless mesh cac** command.

wireless   mesh   cac

Syntax Description	**cac** Configures the mesh CAC Mode.

Command Default   None

Command Modes   config

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the mesh CAC mode:

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

wireless mesh ethernet-bridging allow-bdpu

To configure STP BPDUs for wired mesh uplink, use the **wireless mesh ethernet-bridging allow-bdpu** command.

wireless mesh ethernet-bridging allow-bdpu

Syntax Description	**ethernet-bridging**	Configure ethernet bridging.
	allow-bdpu	Configures STP BPDUs towards wired MESH uplink.

Command Default   None

Command Modes   config

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure STP BPDUs towards wired MESH uplink:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless mesh ethernet-bridging allow-bdpu
```

wireless mesh security psk provisioning

To provision the mesh security psk parameters, use the **wireless mesh security psk provisioning** command.

wireless mesh security psk provisioning {**default_psk** | **inuse** *psk-index* | **key** *psk-index* {**0** | **8**}*enter-psk-name psk-description*}

Syntax Description		
	provisioning	configuring mesh psk provisioning parameters.
	default_psk	Set the mesh provisioning to the default-psk settings.
	inuse	Configuring the psk inuse index
	psk-index	Enter PSK key index. Valid range is between 1 and 5.
	key	Configure a pre-shared-key
	psk-index	Enter PSK key index. Valid range is between 1 and 5.
	0	Choose to enter an UNENCRYPTED password.
	8	Choose to enter an AES encrypted password.
	enter-psk-name	Enter a name for the configured psk key.
	psk-description	Enter a description for this key.

Command Default   None

Command Modes   config

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to provision the default psk key for the mesh security:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless mesh security psk provisioning default_psk
```

wireless mesh subset-channel-sync

To configure the subset channel sync for mobility group, use the **wireless mesh subset-channel-sync** command.

wireless   mesh   subset-channel-sync

Syntax Description	**subset-channel-sync** Configures the subset channel sync for mobility group

Command Default   None

Command Modes   config

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure subset channel sync for mobility group:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless mesh subset-channel-sync
```

wireless mobility

To configure the inter mobility manager, use the **wireless mobility** command.

wireless mobility {**dscp** *value* }

Syntax Description	**dscp** *value* Configures the Mobility inter DSCP value.

Command Default   The default DSCP value is 48.

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shoes how to configure mobility inter DSCP with an value of 20:

```
Device(config)# wireless mobility dscp 20
```

wireless mobility controller peer-group

To configure mobility peer groups, use the **wireless mobility controller peer-group** command, to remove the configuration, use the **no** form of this command.

wireless mobility controller peer-group *peer-group* **member IP** *ip-address***mode centralized**

Syntax Description		
	peer group	Name of the peer group.
	member IP	Adds a peer group member.
	ip-address	IP address of the peer group member to be added.
	mode centralized	Configures the management mode of the peer group member as centrally managed.

Command Default The centralized mode is off.

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE 3.7.0 E	This command was introduced.

```
Device enable
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless mobility controller peer-group peer1 member ip 10.0.0.1 mode
centralized
```

wireless mobility group keepalive

To configure the mobility group parameter and keep alive its ping parameters, use the **wireless mobility group keepalive** command. To remove a mobility group parameter, use the **no** form of the command.

wireless mobility group keepalive {**count** *number* | **interval** *interval*}
no wireless mobility group keepalive {**count** *numbe r* | **interval** *interval*}

Syntax Description	**count** *number*	Number of times that a ping request is sent to a mobility group member before the member is considered unreachable. The range is from 3 to 20. The default is 3.
	interval *interval*	Interval of time between each ping request sent to a mobility group member. The range is from 1 to 30 seconds. The default value is 10 seconds.
		Note For controllers connected through mobility tunnels, ensure that both controllers have the same keepalive interval value.

Command Default   3 seconds for count and 10 seconds for interval.

Command Modes   Global Configuration.

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The default values for *interval* is ten seconds and the default for *retries* is set to three.

This example shows how to specify the amount of time between each ping request sent to a mobility group member to 10 seconds:

```
Device(config)# wireless mobility group keepalive count 10
```

wireless mobility group mac-address

To configure the MAC address to be used in mobility messages, use the **wireless mobility group mac-address** command.

wireless mobility group mac-address *mac-addr*

Syntax Description

mac-addr	MAC address to be used in mobility messages.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure a MAC address to be used in mobility messages:

```
Device(config)# wireless mobility group mac-address 00:0d:ed:dd:25:82
```

wireless mobility group member ip

To add or delete users from mobility group member list, use the **wireless mobility group member ip** command. To remove a member from the mobility group, use the **no** form of the command.

wireless mobility group member ip *ip-address* [**public-ip** *public-ip-address*] [**group** *group-name*]

no wireless mobility group member ip *ip-address*

Syntax Description		
ip-address	The IP address of the member controller.	
public-ip *public-ip-address*	(Optional) Member controller public IP address.	
	Note	This command is used only when the member is behind a NAT. Only static IP NAT is supported.
group *group-name*	(Optional) Member controller group name.	
	Note	This command is used only when the member added in not in the same group as the local mobility controller.

Command Default	None.
Command Modes	Global Configuration.

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines The mobility group is used when there is more than one Mobility Controller (MC) in a given deployment. The mobility group can be assigned with a name or it can use the default group name. The mobility group members need to be configured on all the members of the group to roam within the group.

This example shows how to add a member in a mobility group:

```
Device(config)# mobility group member ip 10.104.171.101 group TestDocGroup
```

wireless mobility group member mac-address

To form a mobility group member list, use the **wireless mobility group member mac-address** command in global configuration mode. To remove a member from a mobility group, use the **no** form of this command.

wireless mobility group member mac-address *peer_mac* **ip** *peer_private_ip* [**public-ip** *peer_public_ip*] **group** *group_name*

Syntax Description		
peer_mac	MAC address of the peer controller.
peer_private_ip	Private IP address of the peer controller.
peer_public_ip	Public IP address of the peer controller.
group_name	Member controller group name.

Command Default Mobility peer is not configured.

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced in a release earlier than Cisco IOS XE Amsterdam 17.1.1s.
	The **public-ip** keyword and the *peer_public_ip* variable are supported from this release.

Example

The following example shows how to create a mobility group member list:

```
Device(config)# wireless mobility group member mac-address 001e.494b.04ff ip 11.0.0.2
public-ip 4.0.0.112 group dom1
```

wireless mobility group multicast-address

To configure the multicast IP address for a non-local mobility group, use the **wireless mobility group multicast-address** command.

wireless mobility group multicast-address *group-name* {**ipv4** | **ipv6**} *ip-addr*

Syntax Description		
	group-name	Name of the non-local mobility group.
	ipv4	Option to enter the IPv4 address.
	ipv6	Option to enter the IPv6 address.
	ip-addr	IPv4 or IPv6 address of the non-local mobility group.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure a multicast IPv4 address of the non-local mobility group:

```
Device(config)# wireless mobility group multicast-address Mygroup ipv4 224.0.0.5
```

wireless mobility group name

To configure hte mobility domain name, use the **wireless mobility group name** command. To remove the mobility domain name, use the **no** form of the command.

Note If you are configuring the mobility group in a network where network address translation (NAT) is enabled, enter the IP address that is sent to the controller from the NAT device rather than the controller's management interface IP address. Otherwise, mobility will fail among controllers in the mobility group.

wireless mobility group name *domain-name*
no wireless mobility group name

Syntax Description	*domain-name*	Creates a mobility group by entering this command. The domain name can be up to 31 case-sensitive characters.

Command Default Default.

Command Modes Global Configuration.

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to configure a mobility domain name lab1:

```
Device(config)# mobility group domain lab1
```

wireless mobility multicast ipv4

To configure multicast IPv4 address for the local mobility group, use the **wireless mobility multicast ipv4** command.

wireless mobility multicast ipv4 *ipv4-addr*

Syntax Description

ipv4-addr	Enter the multicast IPv4 address for the local mobility group.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure multicast IPv4 address for the local mobility group:

```
Device(config)# wireless mobility multicast ipv4 224.0.0.4
```

wireless mobility mac-address

To configure the MAC address to be used in mobility messages,, use the **wireless mobility mac-address** command.

wireless mobility mac-address *mac-address*

Syntax Description

mac-address	MAC address to be used in mobility messages.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure a MAC address to be used in mobility messages:

```
Device(config)# wireless mobility mac-address 00:0d:bd:5e:9f:00
```

wireless multicast

To configure Ethernet multicast parameters, use the **wireless multicast** command.

wireless multicast {*ipv4-address* | **ipv6** *ipv6-address* | **non-ip** [**vlan** *vlan-id*]}

Syntax Description	*ipv4-address*	Multicast IPv4 address.
	ipv6 *ipv6-address*	Multicast IPv6 address.
	non-ip	Configures non-IP multicast in all VLANs. Wireless multicast must be enabled for the traffic to pass.
	non-ip vlan *vlan-id*	Configures non-IP multicast per VLAN. Both wireless multicast and wireless multicast non-IP must be enabled for traffic to pass.
		Valid range for VLAN ID is 1 to 4094.

Command Default	None
Command Modes	Global configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure a non-IP multicast for a VLAN whose ID is 5:

```
Device(config)# wireless multicast non-ip vlan 5
```

wireless profile airtime-fairness

To create a new Cisco ATF policy, use the **wireless profile airtime-fairness** command.

wireless profile airtime-fairness *atf-policy-name* *atf-profile-id*

Syntax Description	*atf-policy-name* Refers to the ATF profile name.
	atf-profile-id Refers to the ATF profile ID. The range is from 0 to 511.

Command Default None

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to create a new Cisco ATF policy:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile airtime-fairness <atf-policy-name> 1
Device(config-config-atf)# weight 5
Device(config-config-atf)# client-sharing
Device(config-config-atf)# end
```

wireless profile ap packet-capture

To configure the wireless AP packet capture profile, use the **wireless profile ap packet-capture** command.

wireless profile ap packet-capture *packet-capture-profile-name*

Syntax Description

packet-capture-profile-name	AP packet capture profile name.

Command Default None

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to configure the AP packet capture profile:

```
Device(config)# wireless profile ap packet-capture test1
```

wireless profile ap priming

To configure a profile to prime access points (APs), use the **wireless profile ap priming** command. To disable priming, use the **no** form of this command.

wireless profile ap priming *profile-name*

no wireless profile ap priming *profile-name*

| Syntax Description | *profile-name* | AP priming profile name. |

| **Command Default** | AP priming profile name is not configured. |

| **Command Modes** | Global configuration (config) |

Command History	**Release**	**Modification**
	Cisco IOS XE Cupertino 17.9.2	This command was introduced.

Usage Guidelines

- An AP filter priming profile can contain up to three controllers. An AP priming profile can either be applied at the AP MAC level or by using a matching regular expression filter.

- AP MAC-based AP priming has the highest priority. If AP MAC-based AP priming is not available, the priming profile under the matching regular expression filter having the highest priority with a valid priming configuration gets appiled.

Examples

The following example shows how to configure profile to prime APs:

```
Device# configure terminal
Device(config)# wireless profile ap priming Prime-FX
```

wireless profile calender-profile name

To configure a calendar profile, use the **wireless profile calender-profile name** command.

wireless profile calender-profile name *name*

Syntax Description

name	Specifies the name of the calendar profile.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines

This example shows how to configure a calendar profile:

```
Device# configure terminal
Device(config)# wireless profile calender-profile name daily_calendar_profile
Device(config-calender-profile)# start 09:00:00 end 17:00:00
Device(config-calender-profile)# recurrance daily
Device(config-calender-profile)# end
```

wireless profile fabric

To configure the fabric profile parameters, use the **wireless profile fabric** command.

wireless profile fabric *fabric-profile-name*

Syntax Description	*fabric-profile-name*	Fabric profile name.
	fabric	Configure Fabric profile parameters.
	profile	Configure profile parameters.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure the fabric profile parameters:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless profile fabric fabric-profile-name
```

wireless profile mesh

To configure the mesh profile on an access point (AP), use the **wireless profile mesh** *profile-name* command.

wireless profile mesh *profile-name*

Syntax Description	*profile-name*	Name of the profile.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Examples

The following example shows how to configure the mesh profile on an AP:

```
Device# configure terminal
(config)#wireless profile mesh test1
```

wireless profile policy

To configure WLAN policy profile, use the **wireless profile policy** command.

wireless profile policy *policy-profile*

Syntax Description

policy-profile	Name of the WLAN policy profile.

Command Default

The default profile name is default-policy-profile.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure a WLAN policy profile:

```
Device(config)# wireless profile policy mywlan-profile-policy
```

wireless profile power

To configure the wireless power policy profile, use the **wireless profile power** command. Use the **no** form of this command to disable the feature.

wireless profile power   *power-profile-name*

Syntax Description

power-profile-name	Specifies the name of the wireless power policy profile.

Command Default None

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.8.1	This command was introduced.

Example

The following example shows how to configure wireless power policy profile:

```
Device(config)# wireless profile power power-profile-name
```

wireless profile tunnel

To configure tunnel profiles, use the **wireless profile tunnel** command.

wireless profile tunnel

Syntax Description	*tunnel-profile-name*	Name of the tunnel profile.
	dhcp-opt82 format mac *raw/colon-delimited*	Configures the format of the MAC address in RID and CID field of option 82.

Command Default	None

Command Modes	Global configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to configure tunnel profiles:

```
Device(config)# wireless profile tunnel tun1
```

wireless profile radio

To configure the wireless radio profile, use the **wireless profile radio** command. Use the **no** form of this command to disable the feature.

wireless profile radio *radio-profile-name*

no wireless profile radio *radio-profile-name*

Syntax Description	**wireless profile radio**	Creates a new wireless radio profile.
	radio-profile-name	Specifies the radio profile name.

Command Default   None

Command Modes   Global configuration mode

Command History	Release	Modification
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Examples   The following example shows you how to configure the wireless radio profile:

```
Device# configure terminal
Device(config)# wireless profile radio radio-profile-name
```

wireless rfid

To set the static radio-frequency identification (RFID) tag data timeout value, use the **wireless rfid** command in global configuration mode.

wireless rfid timeout *timeout-value*

Syntax Description	timeout	Configures the static RFID tag data timeout value.
	timeout-value	RFID tag data timeout value. Valid values range from 60-7200.

Command Default   None

Command Modes   Global configuration (config)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

This example shows how to set the static RFID tag data timeout value.

```
Device(config)# wireless rfid timeout 70
```

wireless security dot1x

To configure IEEE 802.1x global configurations, use the **wireless security dot1x** command.

wireless security dot1x [**eapol-key** {**retries** *retries* | **timeout** *milliseconds*} | **group-key interval** *sec* | **identity-request** {**retries** *retries* | **timeout** *seconds*} | **radius** [**call-station-id**] {**ap-macaddress** | **ap-macaddress-ssid** | **ipaddress** | **macaddress**} | **request** {**retries** *retries* | **timeout** *seconds*} | **wep key** {**index 0** | **index 3**}]

Syntax Description		
eapol-key	Configures eapol-key related parameters.	
retries *retries*	(Optional) Specifies the maximum number of times (0 to 4 retries) that the controller retransmits an EAPOL (WPA) key message to a wireless client. The default value is 2.	
timeout *milliseconds*	(Optional) Specifies the amount of time (200 to 5000 milliseconds) that the controller waits before retransmitting an EAPOL (WPA) key message to a wireless client using EAP or WPA/WPA-2 PSK. The default value is 1000 milliseconds.	
group-key interval *sec*	Configures EAP-broadcast key renew interval time in seconds (120 to 86400 seconds).	
identity-request	Configures EAP ID request related parameters.	
retries *retries*	(Optional) Specifies the maximum number of times (0 to 4 retries) that the controller request the EAP ID. The default value is 2.	
timeout *seconds*	(Optional) Specifies the amount of time (1 to 120 seconds) that the controller waits before retransmitting an EAP Identity Request message to a wireless client. The default value is 30 seconds.	
radius	Configures radius messages.	
call-station-id	(Optional) Configures Call-Station Id sent in radius messages.	
ap-macaddress	Sets Call Station Id Type to the AP's MAC Address.	
ap-macaddress-ssid	Sets Call Station Id Type to 'AP MAC address':'SSID'.	
ipaddress	Sets Call Station Id Type to the system's IP Address.	
macaddress	Sets Call Station Id Type to the system's MAC Address.	
request	Configures EAP request related parameters.	

retries *retries*	(Optional) For EAP messages other than Identity Requests or EAPOL (WPA) key messages, specifies the maximum number of times (0 to 20 retries) that the controller retransmits the message to a wireless client.
	The default value is 2.
timeout *seconds*	(Optional) For EAP messages other than Identity Requests or EAPOL (WPA) key messages, specifies the amount of time (1 to 120 seconds) that the controller waits before retransmitting the message to a wireless client.
	The default value is 30 seconds.
wep key	Configures 802.1x WEP related paramters.
index 0	Specifies the WEP key index value as 0
index 3	Specifies the WEP key index value as 3

Command Default	Default for eapol-key-timeout: 1 second.
	Default for eapol-key-retries: 2 retries.
Command Modes	config

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines	None.

This example lists all the commands under **wireless security dot1x** .

```
Device#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)#wireless security dot1x ?
  eapol-key         Configure eapol-key related parameters
  group-key         Configures EAP-broadcast key renew interval time in seconds
  identity-request  Configure EAP ID request related parameters
  radius            Configure radius messages
  request           Configure EAP request related parameters
  wep               Configure 802.1x WEP related paramters
  <cr>
```

wireless security dot1x radius accounting mac-delimiter

To configure a MAC delimiter for called-station-ID or a calling-station-ID, use the **wireless security dot1x radius accounting mac-delimiter** command.

To remove MAC delimiter for a called-station-ID or a calling-station-ID, use the **no** form of the command.

wireless security dot1x radius accounting mac-delimiter {**colon** | **hyphen** | **none** | **single-hyphen** }

Syntax Description		
	colon	Sets the delimiter to colon.
	hyphen	Sets the delimiter to hyphen.
	none	Disables delimiters.
	single-hyphen	Sets the delimiters to single hyphen.

Command Default   None

Command Modes   Global Configuration Mode

Command History

Release	Modification
Cisco IOS XE 3.6.0 E	This command was introduced.

This example shows how to configure a MAC delimiter for called-station-ID or a calling-station-ID to colon:

```
Device(config)# wireless security dot1x radius accounting mac-delimiter colon
```

wireless security dot1x radius accounting username-delimiter

To set the delimiter type, use **wireless security dot1x radius accounting username-delimiter** command, to remove the configuration, use the **no** form of this command.

wireless security dot1x radius accounting username-delimiter {**colon | hyphen | none | single-hyphen**}

Syntax Description		
colon	Sets the delimiter to colon.	
hyphen	Sets the delimiter to hyphen.	
none	Disables delimiters.	
single-hyphen	Sets the delimiters to single hyphen.	

Command Default   None

Command Modes   Global Configuration Mode.

Command History

Release	Modification
Cisco IOS XE 3.7.2 E	This command was introduced.

This example shows how to sets the delimiter to colon.

```
Device(config)# wireless security dot1x radius acounting username-delimiter colon
```

wireless security dot1x radius callStationIdCase

To configure Call Station Id CASE send in RADIUS messages, use the **wireless security dot1x radius callStationIdCase** command.

To remove the Call Station Id CASE send in RADIUS messages, use the **no** form of the command.

wireless security dot1x radius callStationIdCase {**lower** | **upper**}

Syntax Description	**lower**	Sends all Call Station Ids to RADIUS in lowercase
	upper	Sends all Call Station Ids to RADIUS in uppercase

Command Default None

Command Modes Global Configuration Mode

Command History

Release	Modification
Cisco IOS XE 3.6.0 E	This command was introduced.

This example shows how to configure Call Station Id CASE send in RADIUS messages in lowercase:

```
Device(config)# wireless security dot1x radius callstationIdCase lower
```

wireless security dot1x radius mac-authentication call-station-id

To configure call station ID type for mac-authentication, use the **wireless security dot1x radius mac-authentication call-station-id** command. To remove the configuration, use the **no** form of it.

wireless security dot1x radius mac-authentication call-station-id ap-ethmac-only | ap-ethmac-ssid | ap-group-name | ap-label-address | ap-label-address-ssid | ap-location | ap-macaddress | ap-macaddress-ssid | ap-name | ap-name-ssid | ipaddress | macaddress | vlan-id

Syntax Description

ap-ethmac-only	Sets call station ID type to the AP Ethernet MAC address.
ap-ethmac-ssid	Sets call station ID type to the format 'AP Ethernet MAC address':'SSID'.
ap-group-name	Sets call station ID type to the AP Group Name.
ap-label-address	Sets call station ID type to the AP MAC address on AP Label.
ap-label-address-ssid	Sets call station ID type to the format 'AP Label MAC address': 'SSID'.
ap-location	Sets call station ID type to the AP Location.
ap-macaddress	Sets call station ID type to the AP Radio MAC Address.
ap-macaddress-ssid	Sets call station ID type to the 'AP radio MAC Address':'SSID'.
ap-name	Sets call station ID type to the AP name.
ap-name-ssid	Sets call station ID type to the format 'AP name':'SSID'.
ipaddress	Sets call station ID type to the system IP Address.
macaddress	Sets call station ID type to the system MAC Address.
vlan-id	Sets call station ID type to the VLAN ID.

Command Default None

Command Modes Global Configuration Mode

Command History

Release	Modification
Cisco IOS XE 3.7.2 E	This command was introduced.

The example show how to set call station ID type to the AP Ethernet MAC address:

```
Device(config)# wireless security dot1x radius mac-authentication call-station-id
ap-ethmac-only
```

wireless security dot1x radius mac-authentication mac-delimiter

To configure MAC-Authentication attributes, use the **wireless security dot1x radius mac-authentication mac-delimiter** command.

To remove MAC-Authentication attributes, use the **no** form of the command.

wireless security dot1x radius mac-authentication mac-delimiter {**colon** | **hyphen** | **none** | **single-hyphen** }

Syntax Description

colon	Sets the delimiter to colon.
hyphen	Sets the delimiter to hyphen.
none	Disables delimiters.
single-hyphen	Sets the delimiters to single hyphen.

Command Default None

Command Modes Global Configuration Mode

Command History

Release	Modification
Cisco IOS XE 3.6.0 E	This command was introduced.

This example shows how to configure MAC-Authentication attributes to colon:

```
Device(config)# Scurity dot1x radius mac-authentication mac-delimiter colon
```

wireless security web-auth retries

To enable web authentication retry on a particular WLAN, use the **wireless wireless security web-auth retries** command. To disable, use the **no** form of the command.

wireless security web-auth retries *retries*
no wireless security web-auth retries

Syntax Description	**wireless security web-auth**	Enables web authentication on a particular WLAN.
	retries *retries*	Specifies maximum number of web authentication request retries. The range is from 0 through 30. The default value is 3.

Command Default

Command Modes   config

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   None.

This example shows how to enable web authentication retry on a particular WLAN.

```
Device#configure terminal
Device# wireless security web-auth retries 10
```

wireless tag policy

To configure wireless tag policy, use the **wireless tag policy** command.

wireless tag policy *policy-tag*

Syntax Description	*policy-tag* Name of the wireless tag policy.

Command Default   The default policy tag is default-policy-tag.

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to configure a wireless policy tag:

```
Device(config)# wireless tag policy guest-policy
```

wireless tag rf

To configure the radio frequency (RF) tag, use the syn**wireless tag rf** command. Use the **no** form of this command to disable the feature.

wireless tag rf   *rf-tg-name*

Syntax Description

wireless tag rf	Configures the RF tag parameters.
rf-tg-name	Specifies the name of the RF tag.

Command Default   None

Command Modes   Global configuration mode

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to configure a wireless tag radio frequency (RF):

```
Device# configure terminal
Device(config)# wireless tag rf rf-tag-name
```

wireless tag site

To configure a wireless site tag, use the **wireless tag site** *site-tag*command.

wireless tag site *site-tag*

Syntax Description

site-tag	Name of the site tag.

Command Default   None

Command Modes   Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to configure a site tag:

```
Device(config)# wireless tag site test-site
```

wireless wps ap-authentication

To configure the access point neighbor authentication, use the **wireless wps ap-authentication** command. To remove the access point neighbor authentication, use the no form of the command.

wireless wps ap-authentication [**threshold** *value*]
no wireless wps ap-authentication [**threshold**]

Syntax Description	**threshold** *value* Specifies that the WMM-enabled clients are on the wireless LAN. Threshold value (1 to 255).

Command Default None.

Command Modes config

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines None.

This example shows how to set the threshold value for WMM-enabled clients.

```
Device#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)#wireless wps ap-authentication threshold 65
```

wireless wps ap-authentication threshold

To configure the alarm trigger threshold for access point neighbor authentication, use the **wireless wps ap-authentication threshold** command. To remove the access point neighbor authentication, use the no form of the command.

wireless wps ap-authentication threshold *value*

no wireless wps ap-authentication threshold *value*

Syntax Description	**threshold** *value* Specifies that the WMM-enabled clients are on the wireless LAN. The threshold value range is between 1 and 255. The default value is 1.

Command Default   None

Command Modes   Global Configuration mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 16.12.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to configure the alarm trigger threshold for access point neighbor authentication:

```
Device(config)# wireless wps ap-authentication threshold 1
```

wireless wps client-exclusion

To configure client exclusion policies, use the **wireless wps client-exclusion** command. To remove the client exclusion policies, use the **no** form of the command.

wireless wps client-exclusion {**all** | **dot11-assoc** | **dot11-auth** | **dot1x-auth** | **dot1x-timeout** | **ip-theft** | **web-auth**}
no wireless wps client-exclusion {**all** | **dot11-assoc** | **dot11-auth** | **dot1x-auth** | **dot1x-timeout** | **ip-theft** | **web-auth**}

Syntax Description		
	dot11-assoc	Specifies that the controller excludes clients on the sixth 802.11 association attempt, after five consecutive failures.
	dot11-auth	Specifies that the controller excludes clients on the sixth 802.11 authentication attempt, after five consecutive failures.
	dot1x-auth	Specifies that the controller excludes clients on the sixth 802.11X authentication attempt, after five consecutive failures.
	dot1x-timeout	Enables exclusion on timeout and no response.
	ip-theft	Specifies that the control excludes clients if the IP address is already assigned to another device. For more information, see the Usage Guidelines section.
	web-auth	Specifies that the controller excludes clients on the fourth web authentication attempt, after three consecutive failures.
	all	Specifies that the controller excludes clients for all of the above reasons.

Command Default	Enabled.

Command Modes	config

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines In IP-theft scenarios, there are differences between the older Cisco IOS XE releases and the Cisco IOS XE Denali 16.x releases:

Older Cisco IOS XE Releases	Cisco IOS XE Denali 16.x Releases
Priority wise, wired clients have higher priority over wireless clients, and DHCP IP has higher priority over static IP. The client security type is not checked; security of all client types are treated with same priority. If the existing binding is from a higher priority source, the new binding is ignored and an IP-theft is signaled. If the existing binding has the same source-priority as the new binding, the binding is ignored and an IP-theft is signaled. This ensures that the bindings are not toggled if two hosts send traffic using the same IP. Only the initial binding is retained in the software. If the new binding is from a higher priority source, the existing binding is replaced. This results in an IP-theft notification of existing binding and also a new binding notification.	There is not really a fundamental difference between wired and wireless; what matters is the trust (preflevel) of the entry, which is a function on how it was learnt (ARP, DHCP, ND, and so on) and the policy that is attached to the port. When preflevel is equal, the IP takeover is denied if the old entry is still reachable. IP takeover occurs when the update comes from a trusted port or a new entry gets IP from the DHCP server. Otherwise, you must explicitly grant it. The IP-theft is not reported if an old entry is replaced by a new and a more trusted one.

This example shows how to disable clients on the 802.11 association attempt after five consecutive failures.

```
Device#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)#wireless wps client-exclusion dot11-assoc
```

wireless wps mfp

To configure various Management Frame Protection (MFP) parameters, use the **wireless wps mfp** command.

wireless wps mfp ap-impersonation | **key-refresh-interval** *interval*

Syntax Description	*interval* Specifies the MFP key refresh interval in hours. The valid range is from 1 to 24. The default value is 24.

Command Default   None

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines

This example shows how to configure various Management Frame Protection (MFP) parameters:

```
Device# configure terminal
Device(config)# wireless wps mfp key-refresh-interval 1
```

wireless wps mfp ap-impersonation

To configure AP impersonation detection, use the **wireless wps mfp ap-impersonation** command. Use the **no** form of this command to disable the configuration.

wireless wps mfp ap-impersonation

no wireless wps mfp ap-impersonation

Syntax Description	**ap-impersonation** Configures AP impersonation detection.

Command Default   None

Command Modes   Global Configuration mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 16.12.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to configure AP impersonation detection:

```
Device(config)# wireless wps mfp ap-impersonation
```

wireless wps rogue

To configure various rouge parameters, use the **wireless wps rogue** command.

wireless wps rogue {**adhoc** | **client**} [**alert** *mac-addr* | **contain** *mac-addr no-of-aps*]

Syntax Description		
	adhoc	Configures the status of an Independent Basic Service Set (IBSS or ad-hoc) rogue access point.
	client	Configures rogue clients
	alert *mac-addr*	Generates an SNMP trap upon detection of the ad-hoc rogue, and generates an immediate alert to the system administrator for further action for the MAC address of the ad-hoc rogue access point.
	contain *mac-addr no-of-aps*	Contains the offending device so that its signals no longer interfere with authorized clients.
		Maximum number of Cisco access points assigned to actively contain the ad-hoc rogue access point (1 through 4, inclusive).

Command Default	None.

Command Modes	Global configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines	None.

This example shows how to generate an immediate alert to the system administrator for further action for the MAC address of the ad-hoc rogue access point.

```
Device#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)#wireless wps rouge adhoc alert mac_addr
```

wireless wps rogue network-assurance enable

To enable the rogue wireless service assurance (WSA) events, use the **wireless wps rogue network-assurance enable** command. Use the **no** form of this command to disable the configuration.

wireless wps rogue network-assurance enable

no wireless wps rogue network-assurance enable

Syntax Description

network-assurance enable	Enables rogue WSA events.

Command Default   None

Command Modes   Global Configuration mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 16.12.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to enable the rogue wireless service assurance events:

```
Device(config)# wireless wps rogue network-assurance enable
```

wireless wps rogue ap aaa

To configure the use of AAA/local database to detect valid AP MAC addresses, use the **wireless wps rogue ap aaa** command. Use the **no** form of this command to disable the configuration.

wireless wps rogue ap aaa

no wireless wps rogue ap aaa

Syntax Description	**aaa** Configures the use of AAA or local database to detect valid AP MAC addresses.

Command Default None

Command Modes Global Configuration mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 16.12.1	This command was introduced.

Usage Guidelines None

Example

The following example shows you how to configure the use of AAA/local database to detect valid AP MAC addresses:

```
Device(config)# wireless wps rogue ap aaa
```

wireless wps rogue ap aaa polling-interval

wireless wps rogue ap aaa polling-interval

To configures Rogue AP AAA validation interval, in seconds, use the **wireless wps rogue ap aaa polling-interval** command. To disable the configuration, use the no form of this command.

wireless wps rogue ap aaa polling-interval   *60 - 86400*

no wireless wps rogue ap aaa polling-interval   *60 - 86400*

Syntax Description		
aaa	Sets the use of AAA or local database to detect valid AP MAC addresses.	
polling-interval	Configures the rogue AP AAA validation interval.	
60 - 86400	Specifies AP AAA validation interval, in seconds.	

Command Default   None

Command Modes   Global configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines   None

Example

This example shows how to configures Rogue AP AAA validation interval, in seconds:

```
Device(config)# wireless wps rogue ap aaa polling-interval 120
```

wireless wps rogue ap init-timer

To configure the init timer for rogue APs, use the **wireless wps rogue ap init-timer** command. Use the **no** form of this command to disable the configuration.

wireless wps rogue ap init-timer

no wireless wps rogue ap init-timer

Syntax Description	**init-timer**	Configures the init timer for rogue APs.

Command Default   None

Command Modes   Global Configuration mode

Command History	Release	Modification
	Cisco IOS XE Amsterdam 16.12.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to configure the init timer for rogue APs:

```
Device(config)# wireless wps rogue ap init-timer
```

wireless wps rogue ap mac-address rldp initiate

To initiate and configure Rogue Location Discovery Protocol on rogue APs, use the **wireless wps rogue ap mac-address rldp initiate** command.

wireless wps rogue ap mac-address *<MAC Address>* **rldp initiate**

Syntax Description		
wps	Configures the WPS settings.
rogue	Configures the global rogue devices.
ap mac-address *<MAC Address>*	The MAC address of the APs.
rldp initiate	Initiates RLDP on rogue APs.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 16.12.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to initiate and configure Rogue Location Discovery Protocol on rogue APs:

```
Device# wireless wps rogue ap mac-address 10.1.1 rldp initiate
```

wireless wps rogue ap notify-min-rssi

To configure the minimum RSSI notification threshold for rogue APs, use the **wireless wps rogue ap notify-min-rssi** command. Use the **no** form of this command to disable the configuration.

wireless wps rogue ap notify-min-rssi

no wireless wps rogue ap notify-min-rssi

Syntax Description	**notify-min-rssi**	Configure the minimum RSSI notification threshold for rogue APs.

Command Default   None

Command Modes   Global Configuration mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 16.12.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to configure the minimum RSSI notification threshold for rogue APs:

```
Device(config)# wireless wps rogue ap notify-min-rssi
```

wireless wps rogue ap notify-rssi-deviation

To configure the RSSI deviation notification threshold for rogue APs, use the **wireless wps rogue ap notify-rssi-deviation** command. Use the **no** form of this command to disable the configuration.

wireless wps rogue ap notify-rssi-deviation

no wireless wps rogue ap notify-rssi-deviation

Syntax Description	**notify-rssi-deviation** Configures the RSSI deviation notification threshold for rogue APs.

Command Default   None

Command Modes   Global Configuration mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 16.12.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to configure the RSSI deviation notification threshold for rogue APs:

```
Device(config)# wireless wps rogue ap notify-rssi-deviation
```

wireless wps rogue ap rldp alarm-only

To set Rogue Location Discovery Protocol (RLDP) and alarm if rogue is detected, use the **wireless wps rogue ap rldp alarm-only** command. Use the **no** form of this command to disable the configuration.

wireless wps rogue ap rldp alarm-only

no wireless wps rogue ap rldp alarm-only

Syntax Description	**alarm-only**	Sets RLDP and alarm if rogue is detected.

Command Default   None

Command Modes   Global Configuration mode

Command History	Release	Modification
	Cisco IOS XE Amsterdam 16.12.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows you how to set RLDP and alarm if rogue is detected:

```
Device(config)# wireless wps rogue ap rldp alarm-only
```

wireless wps rogue ap rldp alarm-only monitor-ap-only

To perform RLDP only on monitor APs, use the **wireless wps rogue ap rldp alarm-only monitor-ap-only** command. Use the **no** form of this command to disable the configuration.

wireless wps rogue ap rldp alarm-only monitor-ap-only

no wireless wps rogue ap rldp alarm-only monitor-ap-only

Syntax Description	**monitor-ap-only** Performs RLDP on monitor APs only.

Command Default None

Command Modes Global Configuration mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 16.12.1	This command was introduced.

Usage Guidelines None

Example

The following example shows you how to perform RLDP only on monitor APs,:

```
Device(config)# wireless wps rogue ap rldp alarm-only monitor-ap-only
```

wireless wps rogue ap rldp auto-contain

To configure RLDP, alarm and auto-contain if rogue is detected, use **wirelesswps rogueaprldp auto-contain** command. Use the **no** form of the command to disable the alarm.

[no] wireless wps rogue ap rldp auto-contain monitor-ap-only

Syntax Description

monitor-ap-only	Perform RLDP only on monitor AP

Command Default   None

Command Modes   Global Configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
Cisco IOS XE 3.7.3E	The **no** form of the command was introduced.

Example

This example shows how to configure an alarm for a detected rogue.

Device**wireless wps rogue ap rldp auto-contain**

wireless wps rogue ap rldp retries

To configure RLDP retry times on rogue APs, use the **wireless wps rogue ap rldp retries** command. Use the **no** form of this command to disable the configuration.

wireless wps rogue ap rldp retries

no wireless wps rogue ap rldp retries

Syntax Description	**retries**	Configures RLDP retry times on rogue APs.

Command Default None

Command Modes Global Configuration mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 16.12.1	This command was introduced.

Usage Guidelines None

Example

The following example shows you how to configure RLDP retry times on rogue APs:

```
Device(config)# wireless wps rogue ap rldp retries
```

wireless wps rogue ap rldp schedule

To configure RLDP scheduling, use the **wireless wps rogue ap rldp schedule** command. Use the **no** form of this command to disable the configuration.

wireless wps rogue ap rldp schedule

no wireless wps rogue ap rldp schedule

Syntax Description	**schedule**	Configures RLDP scheduling.

Command Default	None

Command Modes	Global Configuration mode

Command History	**Release**	**Modification**
	Cisco IOS XE Amsterdam 16.12.1	This command was introduced.

Usage Guidelines	None

Example

The following example shows you how to configure RLDP scheduling:

```
Device(config)# wireless wps rogue ap rldp schedule
```

wireless wps rogue ap rldp schedule day

To configure the day when RLDP scheduling is to be done, use the **wireless wps rogue ap rldp schedule day** command. Use the **no** form of this command to disable the configuration.

wireless wps rogue ap rldp schedule day { **friday** | **monday** | **saturday** | **sunday** | **thursday** | **tuesday** | **wednesday** } **start** *[HH:MM:SS]* **end** *[HH:MM:SS]*

no wireless wps rogue ap rldp schedule day { **friday** | **monday** | **saturday** | **sunday** | **thursday** | **tuesday** | **wednesday** } **start** *[HH:MM:SS]* **end** *[HH:MM:SS]*

Syntax Description	**day** {**friday**	**monday**	**saturday**	**sunday**	**thursday**	**tuesday**	**wednesday**}	Configures the day of the week when RLDP scheduling is to be done.
	start *[HH:MM:SS]*	Configures the start time for RLDP schedule for the day.
	end *[HH:MM:SS]*	Configures the end time for RLDP schedule for the day.

Command Default	None
Command Modes	Global Configuration mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 16.12.1	This command was introduced.

Usage Guidelines None

Example

The following example shows you how to configure the day of the week, when RLDP scheduling is to be done:

```
Device(config)# wireless wps rogue ap rldp schedule day friday start 10:10:10 end 15:15:15
```

wireless wps rogue ap timeout

To configure the expiry time for rogue APs, in seconds, use the **wireless wps rogue ap timeout** command. Use the **no** form of this command to disable the configuration.

wireless wps rogue ap timeout   *240-3600*

no wireless wps rogue ap timeout   *240-3600*

Syntax Description	**rogue ap timeout**	Configures the expiry time for rogue APs, in seconds.
	240-3600	Specifies the number of seconds before rogue entries are flushed.

Command Default	None

Command Modes	Global configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines	None

Example

This example shows how to configure the expiry time for rogue APs, in seconds:

```
Device(config)# wireless wps rogue ap timeout 250
```

wireless wps rogue auto-contain

To configure the auto contain level and to configure auto containment for monitor AP mode, use the **wireless wps rogue auto-contain** command. To disable the configuration, use the **no** form of this command.

wireless wps rogue auto-contain { **level** *1 - 4* | **monitor-ap-only** }

no wireless wps rogue auto-contain { **level** *1 - 4* | **monitor-ap-only** }

Syntax Description		
	auto-contain	Configures auto contain for rogue devices.
	level	Configures auto contain levels.
	1 - 4	Specifies the auto containment levels.
	monitor-ap-only	Configures auto contain for monitor AP mode.

Command Default None

Command Modes Global configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines None

Example

This example shows how to configure the auto contain level and to configure auto containment for monitor AP mode:

```
Device(config)# wireless wps rogue auto-contain level 2
Device(config)# wireless wps rogue auto-contain monitor-ap-only
```

wireless wps rogue client aaa

To configure the use of AAA or local database to detect valid MAC addresses of rogue clients, use the **wireless wps rogue client aaa** command. Use the **no** form of this command to disable the configuration.

wireless wps rogue client aaa

no wireless wps rogue client aaa

Syntax Description	**aaa**	Configures the use of AAA or local database to detect valid MAC addresses of rogue clients.

Command Default None

Command Modes Global Configuration mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 16.12.1	This command was introduced.

Usage Guidelines None

Example

The following example shows you how to configure the use of AAA or local database to detect valid MAC addresses of rogue clients:

```
Device(config)# wireless wps rogue client aaa
```

wireless wps rogue client mse

To configure Mobility Services Engine (MSE) to detect valid MAC addresses of rogue clients, use the **wireless wps rogue client mse** command. Use the **no** form of this command to disable the configuration.

wireless wps rogue client mse

no wireless wps rogue client mse

Syntax Description	**mse**	Configures the MSE to detect valid MAC addresses of rogue clients.

Command Default | None

Command Modes | Global Configuration mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 16.12.1	This command was introduced.

Usage Guidelines | None

Example

The following example shows you how to configure Mobility Services Engine (MSE) to detect valid MAC addresses of rogue clients:

```
Device(config)# wireless wps rogue client mse
```

wireless wps rogue client client-threshold

To configure rogue client per a rogue AP SNMP trap threshold, use the **wireless wps rogue client client-threshold** command. To disable the configuration, use the **no** form of this command.

wireless wps rogue client client-threshold *0 - 256*

no wireless wps rogue client client-threshold *0 - 256*

Syntax Description	rogue client	Configures rogue clients.
	client-threshold	Configures the rogue client per a rogue AP SNMP trap threshold.
	0 - 256	Specifies the client threshold.

Command Default	None

Command Modes	Global configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines	None

Example

This example shows how to configure rogue client per a rogue AP SNMP trap threshold:

```
Device(config)# wireless wps rogue ap timeout 250
```

wireless wps rogue client notify-min-rssi

To configure the minimum RSSI notification threshold for rogue clients, use the **wireless wps rogue client notify-min-rssi** command. Use the **no** form of this command to disable the configuration.

wireless wps rogue client notify-min-rssi *-128 - -70*

no wireless wps rogue client notify-min-rssi *-128 - -70*

Syntax Description	rogue clients	Configures rogue clients.
	notify-min-rssi	Configures the minimum RSSI notification threshold for rogue clients.
	-128 - -70	Specifies the RSSI threshold in decibels.

Command Default	None

Command Modes	Global configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines	None

Example

This example shows how to configure the minimum RSSI notification threshold for rogue clients:

```
Device(config)# wireless wps rogue client notify-min-rssi –125
```

wireless wps rogue client notify-rssi-deviation

To configure the RSSI deviation notification threshold for rogue clients, use the **wireless wps rogue client notify-rssi-deviation** command. To disable the configuration, use the **no** form of this command.

wireless wps rogue client notify-rssi-deviation *0 - 10*

no wireless wps rogue client notify-rssi-deviation *0 - 10*

Syntax Description	**notify-rssi-deviation**	Configures the RSSI deviation notification threshold for rogue clients.
	0 - 10	Specifies the RSSI threshold in decibels.

Command Default	None

Command Modes	Global configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines	None

Example

This example shows how to configure the RSSI deviation notification threshold for rogue clients:

```
Device(config)# wireless wps rogue client notify-rssi-deviation 6
```

wireless wps rogue detection

To configure various rouge detection parameters, use the **wireless wps rogue detection** command.

wireless wps rogue detection [**min-rssi** *rssi* | **min-transient-time** *transtime*]

Syntax Description	**min-rssi** *rssi*	Configures the minimum RSSI value that rogues should have for APs to detect and for rogue entry to be created in the device.
	min-transient-time *transtime*	Configures the time interval at which rogues have to be consistently scanned for by APs after the first time the rogues are scanned.

Command Default	None.

Command Modes	Global configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines	None.

This example shows how to configure rogue detection minimum RSSI value and minimum transient time:

```
Device# configure terminal
Device(config)# wireless wps rogue detection min-rssi 100
Device(config)# wireless wps rogue detection min-transient-time 500
Device(config)# end
```

wireless wps rogue notify-syslog

To enable syslog notification for rogue events, use the **wireless wps rogue notify-syslog** command.

wireless wps rogue notify-syslog

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

This example shows how to enable syslog notification for rogue events:

```
Device# configure terminal
Device(config)# wireless wps rogue notify-syslog
```

wireless wps rogue rule

To configure rogue classification rule, use the **wireless wps rogue rule** command.

wireless wps rogue rule *rule-name* **priority** *priority* {**classify {friendly | malicious}** | **condition** {**client-count number | duration | encryption | infrastructure | rssi | ssid**} | **default** | **exit** | **match** {**all | any**} | **no** | **shutdown**}

Syntax Description		
rule *rule-name*	Specifies a rule name.	
priority *priority*	Changes the priority of a specific rule and shifts others in the list accordingly.	
classify	Specifies the classification of a rule.	
friendly	Classifies a rule as friendly.	
malicious	Classifies a rule as malicious.	
condition {**client-count number	duration	encryption	infrastructure	rssi	ssid**}	Specifies the conditions for a rule that the rogue access point must meet. Type of the condition to be configured. The condition types are listed below: • client-count—Requires that a minimum number of clients be associated to a rogue access point. The valid range is 1 to 10 (inclusive). • duration—Requires that a rogue access point be detected for a minimum period of time. The valid range is 0 to 3600 seconds (inclusive). • encryption—Requires that the advertised WLAN does not have encryption enabled. • infrastructure—Requires the SSID to be known to the controller • rssi—Requires that a rogue access point have a minimum RSSI value. The range is from –95 to –50 dBm (inclusive). • ssid—Requires that a rogue access point have a specific SSID.	
default	Sets the command to its default settings.	
exit	Exits the sub-mode.	
match {**all	any**}	Configures matching criteria for a rule. Specifies whether a detected rogue access point must meet all or any of the conditions specified by the rule in order for the rule to be matched and the rogue access point to adopt the classification type of the rule.	
no	Negates a command or set its defaults.	
shutdown	Shuts down the system.	

Command Default   None.

Command Modes   Global configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   None.

This example shows how to create a rule that can organize and display rogue access points as Friendly:

```
Device# configure terminal
Device(config)# wireless wps rogue rule ap1 priority 1
Device(config-rule)# classify friendly
Device(config)# end
```

wireless wps rogue scale mode hybrid

To configure the rogue scale hybrid mode (unused quota reserved for higher priority rogue APs can be used by rogue APs of lower priority when space available), use the **wireless wps rogue scale mode hybrid** command. Use the **no** form of this command to disable the feature.

wireless wps rogue scale mode hybrid

no wireless wps rogue scale mode hybrid

Syntax Description	This command has no keywords or arguments.

Command Default	None

Command Modes	Global Configuration

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

This example shows how to configure the rogue scale hybrid mode:

```
Device(config)# wireless wps rogue scale mode hybrid
```

wireless wps rogue scale priority

To configure the rogue classification priority order, use the **wireless wps rogue scale priority malicious** command. Use the **no** form of this command to disable the feature.

wireless wps rogue scale priority malicious { **high** | **highest** | **low** | **medium** } **custom** { **high** | **highest** | **low** | **medium** } **unclassified** { **high** | **highest** | **low** | **medium** } **friendly** { **high** | **highest** | **low** | **medium** }

no wireless wps rogue scale priority malicious { **high** | **highest** | **low** | **medium** } **custom** { **high** | **highest** | **low** | **medium** } **unclassified** { **high** | **highest** | **low** | **medium** } **friendly** { **high** | **highest** | **low** | **medium** }

Syntax Description	**malicious**	Configures the priority of malicious rogue APs.
	{ **high**	**highest**	**low**	**medium** }	Indicates the Rogue AP storage priority as High, Highest, Medium, and Low.
	custom	Configures the priority of custom classified rogue APs.
	unclassified	Configures the priority of unclassified rogue APs.
	friendly	Configures the priority of friendly rogue APs.

Command Default	None
	The default value for malicious is **highest**, the default value for custom is **high**, the default value for unclassified is **medium**, and the default value for friendly is **low**.

Command Modes	Global Configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

This example shows how to configure the rogue classification priority order:

```
Device(config)# wireless wps rogue scale priority malicious highest custom high unclassified
 medium friendly low
```

wireless wps rogue scale quota

To configure maximum scale rogue AP prioritisation and quotas, use the **wireless wps rogue scale quota** command. Use the **no** form of this command to disable the feature.

wireless wps rogue scale quota malicious *percentage-malicious-rogue-AP* **custom** *percentage-custom-rogue-AP* **unclassified** *percentage-unclassified-rogue-AP* **friendly** *percentage-friendly-rogue-AP*

no wireless wps rogue scale quota malicious *percentage-malicious-rogue-AP* **custom** *percentage-custom-rogue-AP* **unclassified** *percentage-unclassified-rogue-AP* **friendly** *percentage-friendly-rogue-AP*

Syntax Description		
	malicious	Indicates the percentage of the total rogue AP scale reserved for malicious rogue APs.
	percentage-malicious-rogue-AP	Specifies the value in percentage of the total rogue AP scale reserved for malicious rogue APs. The value range is from 0 to 100.
	custom	Indicates the percentage of the total rogue AP scale reserved for custom rogue APs.
	percentage-custom-rogue-AP	Specifies the value in percentage of the total rogue AP scale reserved for custom rogue APs. The value range is from 0 to 100.
	unclassified	Indicates the percentage of the total rogue AP scale reserved for unclassified rogue APs.
	percentage-unclassified-rogue-AP	Specifies the value in percentage of the total rogue AP scale reserved for unclassified rogue APs. The value range is from 0 to 100.
	friendly	Indicates the percentage of the total rogue AP scale reserved for friendly rogue APs.
	percentage-friendly-rogue-AP	Specifies the value in percentage of the total rogue AP scale reserved for friendly rogue APs. The value range is from 0 to 100.

Command Default	None
Command Modes	Global Configuration

Command History	Release	Modification
	Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

This example shows how to configure maximum scale rogue AP prioritisation and quotas:

```
Device(config)# wireless wps rogue scale quota malicious 5 custom 10 unclassified 3 friendly
 5
```

wireless wps rogue security-level

To configure the wireless WPS rogue detection security levels, use the **wireless wps rogue security-level** command. Use the **no** form of this command to disable the configuration.

wireless wps rogue security-level { **critical** | **custom** | **high** | **low** }

no wireless wps rogue security-level { **critical** | **custom** | **high** | **low** }

Syntax Description	**rogue security-level**	Configures the rogue detection security level.
	critical	Specifies the rogue detection setup for highly sensitive deployments.
	custom	Specifies the customizable security level.
	high	Specifies the rogue detection setup for medium-scale deployments.
	low	Specifies the basic rogue detection setup for small-scale deployments.

Command Default   None

Command Modes   Global configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines   None

Example

This example shows how to configure the wireless WPS rogue detection security levels:

```
Device(config)# wireless wps rogue security-level critical
```

wireless-default radius server

To configure multiple radius servers, use the **wireless-default radius server** command.

wireless-default **radius** **server** *IP* **key** *secret*

Command Default	None
Command Modes	Global configuration (config)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines Using this utility, you can configure a maximum of ten radius servers.

Example

This example shows how to configure multiple radius servers:

```
Device# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Device(config)# wireless-default radius server 9.2.58.90 key cisco123
Device(config)# end
```

wlan policy

To map a policy profile to a WLAN profile, use the **wlan policy** command.

wlan *wlan-name* **policy** *policy-name*

Syntax Description	*wlan-name*	Name of the WLAN profile.
	policy	Map a policy profile to the WLAN profile.
	policy-name	Name of the policy profile.

Command Default	None

Command Modes	config-policy-tag

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

wmm

To configure WMM on WLAN, use the **wmm** command. To disable the featue, use the **no** form of the command.

wmm { **allowed** | **require** }

[no] wmm

Syntax Description	**wmm**	Configures WMM (WME).
	allowed	Allows WMM on the WLAN.
	require	Requires WMM clients on the WLAN.

Command Default	None

Command Modes	WLAN configuration

Command History	**Release**	**Modification**
	Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Example

This example shows how to configure WMM on WLAN:

```
Device(config-wlan)#wmm allowed
```

wmm

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- show aaa servers, on page 1008
- show access-list, on page 1010
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- show ap filters all type priming, on page 1051

show aaa dead-criteria radius

To verify the dead-server-detection information for a RADIUS server, use the **show aaa dead-criteria radius** command.

show aaa dead-criteria radius *ipaddr* **auth-port** *authport* **acct-port** *acctport*

Syntax Description

ipaddr	IP address.
authport	Authentication port.
acctport	Accounting port.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines   The **show aaa dead-criteria radius** *ipaddr* command displays output only if default ports are used. For non-default ports, use the **show aaa dead-criteria radius** *ipaddr* **auth-port** *authport* **acct-port** *acctport* command.

Example

The following example shows how to see the dead-server-detection information for a RADIUS server with non-default authorization and accounting ports:

```
Device# show aaa dead-criteria radius 4.4.4.4 auth-port 4444 acct-port 3333

RADIUS: No server group specified. Using radius
RADIUS Server Dead Criteria:
=============================
Server Details:
Address : 4.4.4.4
Auth Port : 4444
Acct Port : 3333
Server Group : radius
Dead Criteria Details:
Configured Retransmits : 3
Configured Timeout : 5
Estimated Outstanding Access Transactions: 0
Estimated Outstanding Accounting Transactions: 0
Dead Detect Time : 10s
Computed Retransmit Tries: 10
Statistics Gathered Since Last Successful Transaction
=====================================================
Max Computed Outstanding Transactions: 0
Max Computed Dead Detect Time: 0s
```

```
Max Computed Retransmits : 0
```

The following example shows how to see the dead-server-detection information for a RADIUS server using default ports:

```
Device# show aaa dead-criteria radius 9.3.13.37

RADIUS: No server group specified. Using radius
RADIUS Server Dead Criteria:
=============================
Server Details:
Address : 9.3.13.37
Auth Port : 1812
Acct Port : 1813
Server Group : radius
Dead Criteria Details:
Configured Retransmits : 3
Configured Timeout : 30
Estimated Outstanding Access Transactions: 1
Estimated Outstanding Accounting Transactions: 0
Dead Detect Time : 10s
Computed Retransmit Tries: 10
Statistics Gathered Since Last Successful Transaction
=====================================================
Max Computed Outstanding Transactions: 4
Max Computed Dead Detect Time: 48s
Max Computed Retransmits : 30
```

show aaa servers

To display the status and number of packets that are sent to and received from all public and private authentication, authorization, and accounting (AAA) RADIUS servers as interpreted by the AAA Server MIB, use the **show aaa servers** command.

show aaa servers [private | public]

Syntax Description		
private	(Optional) Displays private AAA servers only, which are also displayed by the AAA Server MIB.
private	(Optional) Displays public AAA servers only, which are also displayed by the AAA Server MIB.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines   Only RADIUS servers are supported by the **show aaa servers** command.

Example

The following command displays information about packets sent and received for all AAA transaction types--authentication, authorization, and accounting.

```
Device# show aaa servers

RADIUS: id 2, priority 1, host 124.2.2.12, auth-port 1645, acct-port 1612, hostname rsim
    State: current UP, duration 20699s, previous duration 0s
    Dead: total time 0s, count 0
    Platform State from SMD: current UP, duration 20699s, previous duration 0s
    SMD Platform Dead: total time 0s, count 0
    Platform State from WNCD (1) : current UP
    Platform State from WNCD (2) : current UP
    Platform State from WNCD (3) : current UP
    Platform State from WNCD (4) : current UP
    Platform State from WNCD (5) : current UP
    Platform State from WNCD (6) : current UP
    Platform State from WNCD (7) : current UP
    Platform State from WNCD (8) : current UP, duration 964s, previous duration 0s
    Platform Dead: total time 0s, count 0UP
    Quarantined: No
.
.
.

    Elapsed time since counters last cleared: 5h44m
    Estimated Outstanding Access Transactions: 0
    Estimated Outstanding Accounting Transactions: 0
    Estimated Throttled Access Transactions: 0
    Estimated Throttled Accounting Transactions: 0
```

```
Maximum Throttled Transactions: access 0, accounting 0
Consecutive Response Failures: total 0
        SMD Platform : max 0, current 0 total 0
        WNCD Platform: max 0, current 0 total 0
        IOSD Platform : max 0, current 0 total 0
Consecutive Timeouts: total 0
        SMD Platform : max 0, current 0 total 0
        WNCD Platform: max 0, current 0 total 0
        IOSD Platform : max 0, current 0 total 0
Requests per minute past 24 hours:
        high - 5 hours, 44 minutes ago: 0
        low  - 5 hours, 44 minutes ago: 0
        average: 0
```

show access-list

To display access control lists (ACLs) configured on the device, use the **show access-lists** command in privileged EXEC mode.

show access-lists[*namenumber* | **hardware counters** | **ipc**]

Syntax Description

number	(Optional) ACL number. The range is 1 to 2799.
name	(Optional) Name of the ACL.
hardware counters	(Optional) Displays the access list hardware counters.
ipc	(Optional) Display Interprocess Communication (IPC) protocol access-list configuration download information

Command Default

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Usage Guidelines   Though visible in the command-line help strings, the **rate-limit** keyword is not supported

The device supports only IP standard and extended access lists. Therefore, the allowed numbers are only 1 to 199 and 1300 to 2799.

This command also displays the MAC ACLs that are configured.

This is an example of output from the **show access-lists** command:

```
Device# show access-lists

Extended IP access list 103
    10 permit ip any any dscp af11
Extended IP access list ssm-range
    10 deny ip any 232.0.0.0 0.255.255.255
    20 permit ip any any
Extended MAC access list mac1
```

This is an example of output from the **show access-lists hardware counters** command:

```
Device# show access-lists hardware counters
 L3 ACL INPUT Statistics
    All  Drop:                   frame count: 0
    All  Bridge Only:            frame count: 0
    All  Forwarding To CPU:      frame count: 294674
    All  Forwarded:              frame count: 2577677
```

```
            All   Drop And Log:            frame count: 0
            All   Bridge Only And Log:     frame count: 0
            All   Forwarded And Log:       frame count: 0
            All   IPv6 Drop:               frame count: 0
            All   IPv6 Bridge Only:        frame count: 0
            All   IPv6 Forwarding To CPU:  frame count: 0
            All   IPv6 Forwarded:          frame count: 102
            All   IPv6 Drop And Log:       frame count: 0
            All   IPv6 Bridge Only And Log: frame count: 0
            All   IPv6 Forwarded And Log:  frame count: 0


    L3 ACL OUTPUT Statistics
            All   Drop:                    frame count: 0
            All   Bridge Only:             frame count: 0
            All   Forwarding To CPU:       frame count: 0
            All   Forwarded:               frame count: 266050
            All   Drop And Log:            frame count: 0
            All   Bridge Only And Log:     frame count: 0
            All   Forwarded And Log:       frame count: 0
            All   IPv6 Drop:               frame count: 0
            All   IPv6 Bridge Only:        frame count: 0
            All   IPv6 Forwarding To CPU:  frame count: 0
            All   IPv6 Forwarded:          frame count: 0
            All   IPv6 Drop And Log:       frame count: 0
            All   IPv6 Bridge Only And Log: frame count: 0
            All   IPv6 Forwarded And Log:  frame count: 0
```

show ap name icap subscription ap rf spectrum

To display the spectrum configuration details of a corresponding AP, use the **show ap name icap subscription ap rf spectrum** command.

show ap name *ap_name***icap subscription ap rf spectrum**

<table>
<tr><td>Syntax Description</td><td>ap_name</td><td>AP name</td></tr>
</table>

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 17.2.1	This command was introduced.

Example

The following example shows how to display spectrum analysis on a AP:

```
Device# show ap name 4800AP icap subscription ap rf spectrum
Per-AP ICap configuration

AP RF spectrum subscription
  State                  : enabled
  Radio slots            : none
```

show ap airtime-fairness summary

To view the ATF configuration summary of all radios, use the **show ap airtime-fairness summary** command.

show ap airtime-fairness summary

Syntax Description

This command has no arguments.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the ATF configuration summary of all radios:

```
Device# show ap airtime-fairness summary
```

show ap audit-report detail

To display the configuration of an AP, use the **show ap** *ap-name* **audit-report detail** command.

show ap *ap-name* **audit-report detail**

Syntax Description	

ap-name	AP name.
detail	Displays audit report for an AP.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

This following example shows how to display the audit report for an AP:

```
Device# show ap Cisco-AP audit-report detail
Cisco AP Name   : Cisco-AP
=================================================

Radio Audit Report:

Slot   Channel   Bandwidth   Tx Power   Admin State      Operation State   Radio Role
Radio Operation
------------------------------------------------------------------------------------------------------
0        IN_SYNC   IN_SYNC     IN_SYNC    OUT_OF_SYNC    IN_SYNC                 IN_SYNC
   IN_SYNC
1        IN_SYNC   IN_SYNC     IN_SYNC    OUT_OF_SYNC    IN_SYNC                 IN_SYNC
   IN_SYNC

WLAN Audit Report:

Slot-id Wlan-id Vlan        State              SSID        Auth Type    Flags
------------------------------------------------------------------------------------------------------
0         1              IN_SYNC   OUT_OF_SYNC IN_SYNC    IN_SYNC    IN_SYNC
0         2              IN_SYNC   OUT_OF_SYNC IN_SYNC    IN_SYNC    IN_SYNC
1         1              IN_SYNC   OUT_OF_SYNC IN_SYNC    IN_SYNC    IN_SYNC
1         2              IN_SYNC   OUT_OF_SYNC IN_SYNC    IN_SYNC    IN_SYNC
```

show ap audit-report summary

To display the audit report summary for an AP, use the **show ap audit-report summary** command.

show ap audit-report summary

Syntax Description

This command has no arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

The following example shows how to display the audit report summary of an AP:

```
Device# show ap audit-report summary
WTP Mac                  Radio            Wlan              IPv4 Acl
IPv6 Acl     Last Report Time
_____

1880.90fd.6b40   OUT_OF_SYNC    OUT_OF_SYNC    IN_SYNC        IN_SYNC        01/01/1970
05:30:00 IST
```

show ap auth-list

To see the access point authorization list, use the **show ap auth-list** command.

show ap auth-list [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	*chassis-number* Chassis number as either 1 or 2.
	active R0 Active instance in Route-processor slot 0.
	standby R0 Standby instance in Route-processor slot 0.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the access point authorization list:

```
Device# show ap auth-list
```

show ap auth-list ap-cert-policy

To verify if the APs have been authorized by the AP certificate policy, use the **show ap auth-list ap-cert-policy**

show ap auth-list ap-cert-policy

Syntax Description

This command has no arguments.

Command Default

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Example

The following example shows how to verify if the APs have been authorized by the AP certificate policy:

```
Device# show ap auth-list ap-cert-policy
```

show ap auto-rf

To display the auto-RF settings for a Cisco lightweight access point, use the **show ap auto-rf** command.

show ap auto-rf dot11{**24ghz** | **5ghz** | **dual-band**} *cisco_ap*

Syntax Description		
24ghz	Specifies the 802.11b AP.
5ghz	Specifies the 802.11a AP.
dual-band	Specifies dual bands.

Command Default   None

Usage Guidelines   The **show ap auto-rf command** output will not display neighbor AP names.

The following example shows how to display auto-RF information for an access point:

```
Device# show ap auto-rf dot11 24ghz AP1

####################################################################

Number of Slots                                  : 3
AP Name                                          : APA023.9FD8.EA22
MAC Address                                      : 40ce.24bf.8ca0
Ethernet MAC Address                             : a023.9fd8.ea22
 Slot ID                                         : 0
 Radio Type                                      : 802.11n - 2.4 GHz
 Current TX/RX Band                              : 2.4Ghz band
 Subband Type                                    : All
 Noise Information
  Noise Profile                                  : Passed
  Channel   1                                    :  -91 dBm
  Channel   2                                    :  -67 dBm
  Channel   3                                    :  -54 dBm
  Channel   4                                    :  -55 dBm
  Channel   5                                    :  -71 dBm
  Channel   6                                    :  -85 dBm
  Channel   7                                    :  -50 dBm
  Channel   8                                    :  -54 dBm
  Channel   9                                    :  -77 dBm
  Channel  10                                    :  -88 dBm
  Channel  11                                    :  -65 dBm
 Interference Information
  Interference Profile                           : Failed
  Channel   1                                    :  -47 dBm @ 21% busy
  Channel   2                                    :  -45 dBm @  2% busy
  Channel   3                                    : -128 dBm @  0% busy
  Channel   4                                    : -128 dBm @  0% busy
  Channel   5                                    :  -48 dBm @  2% busy
  Channel   6                                    :  -45 dBm @  2% busy
  Channel   7                                    :  -42 dBm @  3% busy
  Channel   8                                    : -128 dBm @  0% busy
  Channel   9                                    : -128 dBm @  0% busy
  Channel  10                                    :  -39 dBm @  3% busy
  Channel  11                                    :  -46 dBm @  3% busy
 Rogue Histogram (20)
   Channel   1                                   : 36
```

```
                 Channel   2                                   :  0
                 Channel   3                                   :  0
                 Channel   4                                   :  1
                 Channel   5                                   :  0
                 Channel   6                                   : 11
                 Channel   7                                   :  0
                 Channel   8                                   :  1
                 Channel   9                                   :  3
                 Channel  10                                   :  0
                 Channel  11                                   : 14
             Load Information
               Load Profile                                  : Failed
               Receive Utilization                           : 0%
               Transmit Utilization                          : 0%
               Channel Utilization                           : 98%
               Attached Clients                              : 0 clients
             Coverage Information
               Coverage Profile                              : Passed
               Failed Clients                                : 0 clients
             Client Signal Strengths
               RSSI -100 dBm                                 : 0 clients
               RSSI  -92 dBm                                 : 0 clients
               RSSI  -84 dBm                                 : 0 clients
               RSSI  -76 dBm                                 : 0 clients
               RSSI  -68 dBm                                 : 0 clients
               RSSI  -60 dBm                                 : 0 clients
               RSSI  -52 dBm                                 : 0 clients
             Client Signal to Noise Ratios
               SNR   0 dB                                    : 0 clients
               SNR   5 dB                                    : 0 clients
               SNR  10 dB                                    : 0 clients
               SNR  15 dB                                    : 0 clients
               SNR  20 dB                                    : 0 clients
               SNR  25 dB                                    : 0 clients
               SNR  30 dB                                    : 0 clients
               SNR  35 dB                                    : 0 clients
               SNR  40 dB                                    : 0 clients
               SNR  45 dB                                    : 0 clients
             Nearby APs
               AP d0ec.3572.b9a0 slot 0                      :  -23 dBm on ( 11, 20 MHz) (181.22.0.22)
               AP 0c75.bdb3.9000 slot 0                      :  -28 dBm on ( 11, 20 MHz) (181.21.0.21)
               AP a4b2.3980.3740 slot 0                      :  -28 dBm on (  1, 20 MHz) (181.21.0.21)
               AP d0ec.3576.8320 slot 0                      :  -33 dBm on ( 11, 20 MHz) (50.1.1.122)
               AP a0f8.49dc.9780 slot 0                      :  -34 dBm on (  1, 20 MHz) (9.9.57.94)
               AP a0f8.49dc.8260 slot 0                      :  -34 dBm on (  6, 20 MHz) (9.9.57.94)
               AP d0ec.3573.7c80 slot 0                      :  -36 dBm on (  6, 20 MHz) (192.185.183.44)

               AP 00b0.e192.9d20 slot 0                      :  -36 dBm on ( 11, 20 MHz) (9.9.42.47)
               AP a4b2.397f.41c0 slot 0                      :  -36 dBm on (  1, 20 MHz) (185.10.0.10)
               AP 2c5a.0fd5.b8c0 slot 0                      :  -36 dBm on (  6, 20 MHz) (9.7.97.51)
               AP a488.7351.4740 slot 0                      :  -36 dBm on ( 11, 20 MHz) (9.7.97.51)
               AP 10b3.d5e9.c8e0 slot 0                      :  -36 dBm on (  1, 20 MHz) (50.1.1.122)
               AP 0c75.bdb3.ab00 slot 0                      :  -37 dBm on (  6, 20 MHz) (185.10.0.10)
               AP 68ca.e451.5120 slot 0                      :  -37 dBm on (  1, 20 MHz) (9.4.155.15)
               AP a0f8.49dc.97a0 slot 0                      :  -37 dBm on ( 11, 20 MHz) (9.9.57.94)
               AP 188b.4501.7940 slot 0                      :  -38 dBm on ( 11, 20 MHz) (9.9.57.94)
               AP 002c.c88a.f8e0 slot 0                      :  -38 dBm on ( 11, 20 MHz) (9.9.50.55)
               AP 7069.5a78.4960 slot 0                      :  -38 dBm on ( 11, 20 MHz) (9.7.97.51)
               AP 3c41.0ea7.0880 slot 0                      :  -39 dBm on ( 11, 20 MHz) (185.10.0.10)
               AP a0f8.49dc.93a0 slot 0                      :  -39 dBm on (  6, 20 MHz) (9.9.57.94)
               AP f4db.e685.7360 slot 0                      :  -39 dBm on (  6, 20 MHz) (50.1.1.122)
               AP 7070.8bb4.4120 slot 0                      :  -40 dBm on ( 11, 20 MHz) (9.9.57.94)
               AP 707d.b93e.39e0 slot 0                      :  -40 dBm on (  1, 20 MHz) (4.4.4.1)
               AP 706d.150c.6860 slot 0                      :  -40 dBm on ( 11, 20 MHz) (50.1.1.122)
```

```
Radar Information
Channel Assignment Information via DCA
  Current Channel Average Energy               :  -50 dBm
  Previous Channel Average Energy              :  -50 dBm
  Channel Change Count                         : 9
  Last Channel Change Time                     : 02/14/2021 20:54:57
  Recommended Best Channel                     : 1
RF Parameter Recommendations
  Power Level                                  : 8
  RTS/CTS Threshold                            : 2347
  Fragmentation Threshold                      : 2346
  Antenna Pattern                              : 0
Persistent Interference Devices
Class Type              Channel  DC (%%)  RSSI (dBm)  Last Update Time
----------------------  -------  ------   ---------   ----------------
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```

show ap ble cmx detail ip

To view the BLE management feature related global values for a specific CMX along with all the APs associated to that CMX, use the **show ap ble cmx detail ip** command.

show ap ble cmx detail ip *CMX-IP*

Syntax Description

CMX-IP	Specifies the IPv4 address.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Usage Guidelines

This example shows how to display the BLE management feature related global values for a specific CMX along with all the APs associated to that CMX:

```
Device# show ap ble cmx detail ip 10.1.2.3
BLE administrative status: Up
BLE operational status: Up
Scanning interval: 10

  AP Name                        Interface          Status
  -------------------------------------------------------------
  AP4001.7AB2.C39A               Integrated         Open
```

show ap ble cmx summary

To view the list of all CMXs registered for BLE Management feature and their global values for BLE, use the **show ap ble cmx summary** command.

show ap ble cmx summary

Syntax Description	This command has no keywords or arguments.

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Usage Guidelines

This example shows how to view the list of all CMXs registered for BLE Management feature and their global values for BLE:

```
Device# show ap ble cmx summary
CMX IP: 10.1.2.3
----------------------
  BLE administrative status: Up
  BLE operational status: Up
  Scanning interval: 12

CMX IP: 10.1.2.4
----------------------
  BLE administrative status: Down
  BLE operational status: Down
   Reason: BLE is administratively down
  Scanning interval: 0

CMX IP: 10.1.2.5
------------------
BLE administrative status: Up
BLE operational status: Down
 Reason: CMX is not subscribed to AP Monitor and RSSI services, or NMSP connection is down
Scanning interval: 10
```

show ap ble summary

To view the list of joined APs that support BLE Management feature along with the BLE details for each AP, use the **show ap ble summary** command.

show ap ble summary

Syntax Description	This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.
Cisco IOS XE Cupertino 17.9.1	The output of the command is modified to add new column that displays scan status.

Usage Guidelines   The BLE Management feature is enabled and APs are displayed only when the CMX is registered with the controller, and BLE is enabled on CMX.

This example shows how to view the list of joined APs that support BLE Management feature along with the BLE details for each AP:

```
Device# show ap ble summary
AP Name                          Interface            Status    CMX IP
----------------------------------------------------------------------------
AP4001.7AB2.C39A                 Integrated           Open      10.1.2.3
AP4001.7AB2.C39B                 Integrated           Closed    10.1.2.4

Device# show ap ble summary

AP Name   AP Model     AP Ethernet MAC  BLE                BLE           BLE mode      BLE
  MAC         BLE Profile      BLE Scan
                                         Interface State   Admin State
_____
AP794    C9130AXI-B   04eb.409e.xxxx   Open               Up            Base (Native)
806f.b031.xxxx  Eddystone URL    Enabled/Disabled
AP50     C9130AXI-B   04eb.409e.xxxx   Close              Down          Base (Native)
Unknown       Not Configured   Enabled/Disabled
AP28     C9136I       687d.b45c.xxxx   Close              Down          Base (Native)
Unknown       Not Configured   Enabled/Disabled
```

show ap config

To display configuration settings for all access points that join the device, use the **show ap config** command.

show ap config {**general** | **global**}

Syntax Description	**ethernet**	Displays ethernet VLAN tagging information for all Cisco APs.
	general	Displays common information for all Cisco APs.
	global	Displays global settings for all Cisco APs.

Command Default   None

Command Modes   Any command mode

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to display global syslog server settings:

```
Device# show ap config global

AP global system logging host              : 255.255.255.255
```

show ap config general

To view the general configuration information of all the Cisco APs, use the **show ap config general** command.

show ap config general

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

This example shows how to view the general configuration information of all Cisco APs:

```
Device# show ap config general
Cisco AP Name   : AP4C77.6DF2.D588
==================================================
<SNIP>
Dhcp Server                                       : Enabled
```

show ap client-trace events all

To view the AP client trace event information, use the **show ap client-trace events all** command.

show ap client-trace events all

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Examples   This example shows how to view the AP client trace event information:

```
Device# show ap client-trace events all

[*04/29/2019 11:49:21.964964] [AP58AC.78DC.AAA0] [38:e6:0a:ea:99:d4] <apr1v0> [D:W]
DOT11_AUTHENTICATION : (.)
[*04/29/2019 11:49:21.972209] [AP58AC.78DC.AAA0] [38:e6:0a:ea:99:d4] <apr1v0> [U:W]
DOT11_ASSOC_REQUEST : (.)
[*04/29/2019 11:49:21.972227] [58:ac:78:df:6d:0f] [client] Vendor specific OUI: 00:50:f2
and Type: 02
[*04/29/2019 11:49:21.975975] [AP58AC.78DC.AAA0] [38:e6:0a:ea:99:d4] <apr1v0> [D:W]
DOT11_ASSOC_RESPONSE : (.)
```

show ap crash-file

To display the list of both crash and radio core dump files generated by lightweight access points, use the **show ap crash-file** command.

show ap crash-file chassis *chassis-number <1-2>* **active standby**

Syntax Description	chassis	Displays the chassis details.
	chassis-number	Specifies the chassis number, either 1 or 2.
	active	Specifies an active instance.
	standby	Specifies a standby instance.

Command Default None

Command Modes Any command mode

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to display the crash file generated by the access point:

```
Device# show ap crash-file
```

show ap dot11

To view 802.11a or 802.11b or 6-GHz configuration information, use the **show ap dot11** command.

show ap dot11 { **24ghz** | **5ghz** | **6ghz** } { **channel** | **coverage** | **group** | **load-info** | **logging** | **media-stream** | **monitor** | **network** | **profile** | **receiver** | **service-policy** | **summary** | **txpower** | **ccx global** }

Syntax Description		
24ghz	Specifies the 2.4-GHz band.
5ghz	Specifies the 5-GHz band.
6ghz	Specifies the 6-GHz band.
channel	Displays the automatic channel assignment configuration and statistics.
coverage	Displays the configuration and statistics for coverage hole detection.
group	Displays 802.11a, 6-GHz or 802.11b Cisco radio RF grouping.
load-info	Displays channel utilization and client count information for all Cisco APs.
logging	Displays 802.11a, 6-GHz or 802.11b RF event and performance logging.
media-stream	Display 802.11a, 6-GHz or 802.11b Media Resource Reservation Control configurations.
monitor	Displays the 802.11a, 6-GHz or 802.11b default Cisco radio monitoring.
network	Displays the 802.11a, 6-GHz or 802.11b network configuration.
profile	Displays the 802.11a, 6-GHz or 802.11b lightweight access point performance profiles.
receiver	Displays the configuration and statistics of the 802.11a, 6-GHz or 802.11b receiver.
service-policy	Displays the Quality of Service (QoS) service policies for 802.11a, 6-GHz or 802.11b radio for all Cisco access points.
summary	Displays the 802.11a, 6-GHz or 802.11b Cisco lightweight access point name, channel, and transmit level summary.
txpower	Displays the 802.11a, 6-GHz or 802.11b automatic transmit power assignment.

ccx global	Displays 802.11a, 6-GHz or 802.11b Cisco Client eXtensions (CCX) information for all Cisco access points that are joined to the device.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1 Cisco IOS XE Gibraltar 16.12.2s	This command was introduced.
	The **load-info** parameter was added.
Cisco IOS XE Cupertino 17.7.1	This command was modified to include the 6-GHz band.

This example shows how to display the automatic channel assignment configuration and statistics:

```
Device# show ap dot11 5ghz channel
Automatic Channel Assignment
  Channel Assignment Mode                 : AUTO
  Channel Update Interval                 : 12 Hours
  Anchor time (Hour of the day)           : 20
  Channel Update Contribution             : SNI.
  Channel Assignment Leader               : web (9.9.9.2)
  Last Run                                : 13105 seconds ago
  DCA Sensitivity Level                   : MEDIUM (15 dB)
  DCA 802.11n Channel Width               : 40 Mhz
  Channel Energy Levels
      Minimum                             : unknown
      Average                             : unknown
      Maximum                             : unknown
  Channel Dwell Times
      Minimum                             : unknown
      Average                             : unknown
      Maximum                             : unknown
  802.11a 5 GHz Auto-RF Channel List
  Allowed Channel List                    : 36,40,44,48,52,56,60,64,149,153,1
57,161
  Unused Channel List                     : 100,104,108,112,116,132,136,140,1
65
  802.11a 4.9 GHz Auto-RF Channel List
  Allowed Channel List                    :
  Unused Channel List                     : 1,2,3,4,5,6,7,8,9,10,11,12,13,14,
15,16,17,18,19,20,21,22,23,24,25,26
  DCA Outdoor AP option                   : Disabled
```

This example shows how to display the statistics for coverage hole detection:

```
Device# show ap dot11 5ghz coverage
Coverage Hole Detection
  802.11a Coverage Hole Detection Mode      : Enabled
  802.11a Coverage Voice Packet Count       : 100 packet(s)
  802.11a Coverage Voice Packet Percentage  : 50 %
  802.11a Coverage Voice RSSI Threshold     : -80dBm
  802.11a Coverage Data Packet Count        : 50 packet(s)
  802.11a Coverage Data Packet Percentage   : 50 %
  802.11a Coverage Data RSSI Threshold      : -80dBm
```

```
802.11a Global coverage exception level      : 25
802.11a Global client minimum exception level  : 3 clients
```

This example shows how to display Cisco radio RF group settings:

```
Device# show ap dot11 5ghz group
Radio RF Grouping

  802.11a Group Mode                 : STATIC
  802.11a Group Update Interval      : 600 seconds
  802.11a Group Leader               : web (10.10.10.1)
  802.11a Group Member               : web(10.10.10.1)
                                       nb1(172.13.21.45) (*Unreachable)
  802.11a Last Run                   : 438 seconds ago


  Mobility Agents RF membership information
  ------------------------------------------------------------
  No of 802.11a MA RF-members : 0
```

This example shows how to display 802.11a RF event and performance logging:

```
Device# show ap dot11 5ghz logging
RF Event and Performance Logging

  Channel Update Logging             : Off
  Coverage Profile Logging           : Off
  Foreign Profile Logging            : Off
  Load Profile Logging               : Off
  Noise Profile Logging              : Off
  Performance Profile Logging        : Off
  TxPower Update Logging             : Off
```

This example shows how to display the 802.11a media stream configuration:

```
Device# show ap dot11 5ghz media-stream
Multicast-direct              : Disabled
Best Effort                   : Disabled
Video Re-Direct               : Disabled
Max Allowed Streams Per Radio   : Auto
Max Allowed Streams Per Client  : Auto
Max Video Bandwidth           : 0
Max Voice Bandwidth           : 75
Max Media Bandwidth           : 85
Min PHY Rate (Kbps)           : 6000
Max Retry Percentage          : 80
```

This example shows how to display the radio monitoring for the 802.11b network:

```
Device# show ap dot11 5ghz monitor
Default 802.11a AP monitoring

  802.11a Monitor Mode                       : Enabled
  802.11a Monitor Mode for Mesh AP Backhaul  : disabled
  802.11a Monitor Channels                   : Country channels
  802.11a RRM Neighbor Discover Type         : Transparent
  802.11a AP Coverage Interval               : 180 seconds
  802.11a AP Load Interval                   : 60 seconds
  802.11a AP Noise Interval                  : 180 seconds
  802.11a AP Signal Strength Interval        : 60 seconds
```

This example shows how to display the global configuration and statistics of an 802.11a profile:

```
Device# show ap dot11 5ghz profile
Default 802.11a AP performance profiles
802.11a Global Interference threshold.............. 10%
802.11a Global noise threshold..................... -70 dBm
802.11a Global RF utilization threshold............ 80%
802.11a Global throughput threshold................ 1000000 bps
802.11a Global clients threshold................... 12 clients
802.11a Global coverage threshold.................. 12 dB
802.11a Global coverage exception level............ 80%
802.11a Global client minimum exception lev........ 3 clients
```

This example shows how to display the network configuration of an 802.11a profile:

```
Device# show ap dot11 5ghz network
802.11a Network : Enabled
11nSupport : Enabled
  802.11a Low Band : Enabled
  802.11a Mid Band : Enabled
  802.11a High Band : Enabled

802.11a Operational Rates
  802.11a 6M : Mandatory
  802.11a 9M : Supported
  802.11a 12M : Mandatory
  802.11a 18M : Supported
  802.11a 24M : Mandatory
  802.11a 36M : Supported
  802.11a 48M : Supported
  802.11a 54M : Supported
802.11n MCS Settings:
  MCS 0 : Supported
  MCS 1 : Supported
  MCS 2 : Supported
  MCS 3 : Supported
  MCS 4 : Supported
  MCS 5 : Supported
  MCS 6 : Supported
  MCS 7 : Supported
  MCS 8 : Supported
  MCS 9 : Supported
  MCS 10 : Supported
  MCS 11 : Supported
  MCS 12 : Supported
  MCS 13 : Supported
  MCS 14 : Supported
  MCS 15 : Supported
  MCS 16 : Supported
  MCS 17 : Supported
  MCS 18 : Supported
  MCS 19 : Supported
  MCS 20 : Supported
  MCS 21 : Supported
  MCS 22 : Supported
  MCS 23 : Supported
802.11n Status:
  A-MPDU Tx:
    Priority 0 : Enabled
    Priority 1 : Disabled
    Priority 2 : Disabled
    Priority 3 : Disabled
    Priority 4 : Enabled
    Priority 5 : Enabled
```

```
      Priority 6 : Disabled
      Priority 7 : Disabled
    A-MSDU Tx:
      Priority 0 : Enabled
      Priority 1 : Enabled
      Priority 2 : Enabled
      Priority 3 : Enabled
      Priority 4 : Enabled
      Priority 5 : Enabled
      Priority 6 : Disabled
      Priority 7 : Disabled
    Guard Interval : Any
    Rifs Rx : Enabled
Beacon Interval : 100
CF Pollable mandatory : Disabled
CF Poll Request Mandatory : Disabled
CFP Period : 4
CFP Maximum Duration : 60
Default Channel : 36
Default Tx Power Level : 1
DTPC Status : Enabled
Fragmentation Threshold : 2346
Pico-Cell Status : Disabled
Pico-Cell-V2 Status : Disabled
TI Threshold : 0
Legacy Tx Beamforming setting : Disabled
Traffic Stream Metrics Status : Disabled
Expedited BW Request Status : Disabled
EDCA profile type check : default-wmm
Call Admision Control (CAC) configuration
Voice AC
  Voice AC - Admission control (ACM) : Disabled
  Voice Stream-Size : 84000
  Voice Max-Streams : 2
  Voice Max RF Bandwidth : 75
  Voice Reserved Roaming Bandwidth : 6
  Voice Load-Based CAC mode : Enabled
  Voice tspec inactivity timeout : Enabled
CAC SIP-Voice configuration
  SIP based CAC : Disabled
  SIP call bandwidth : 64
  SIP call bandwith sample-size : 20
Video AC
  Video AC - Admission control (ACM) : Disabled
  Video max RF bandwidth : Infinite
  Video reserved roaming bandwidth : 0
```

This example shows how to display the global configuration and statistics of an 802.11a profile:

```
Device# show ap dot11 5ghz receiver
Default 802.11a AP performance profiles
802.11a Global Interference threshold.............. 10%
802.11a Global noise threshold..................... -70 dBm
802.11a Global RF utilization threshold............ 80%
802.11a Global throughput threshold................ 1000000 bps
802.11a Global clients threshold................... 12 clients
802.11a Global coverage threshold.................. 12 dB
802.11a Global coverage exception level............ 80%
802.11a Global client minimum exception lev........ 3 clients
```

This example shows how to display the global configuration and statistics of an 802.11a profile:

```
Device# show ap dot11 5ghz service-policy
```

This example shows how to display a summary of the 802.11b access point settings:

```
Device# show ap dot11 5ghz summary
AP Name MAC Address       Admin State Operation State Channel TxPower
------- ----------------- ----------- --------------- ------- -------
CJ-1240 00:21:1b:ea:36:60 ENABLED     UP              161     1( )
CJ-1130 00:1f:ca:cf:b6:60 ENABLED     UP              56*     1(*)
```

This example shows how to display the configuration and statistics of the 802.11a transmit power cost:

```
Device# show ap dot11 5ghz txpower
Automatic Transmit Power Assignment

Transmit Power Assignment Mode         : AUTO
Transmit Power Update Interval         : 600 seconds
Transmit Power Threshold               : -70 dBm
Transmit Power Neighbor Count          : 3 APs
Min Transmit Power                     : -10 dBm
Max Transmit Power                     : 30 dBm
Transmit Power Update Contribution     : SNI.
Transmit Power Assignment Leader       : web (10.10.10.1)
Last Run                               : 437 seconds ago
```

This example shows how to display the configuration and statistics of the 802.11a transmit power cost:

```
Device# show ap dot11 5ghz ccx global
 802.11a Client Beacon Measurements:
     disabled
```

show ap dot11

To display 802.11 band parameters, use the **show ap dot11** command.

show ap dot11 {**24ghz** | **5ghz**} {**media-stream rrc** | **network** | **profile** | **summary**}

Syntax Description		
	media-stream rrc	Displays Media Stream configurations.
	network	Shows network configuration.
	profile	Shows profiling information for all Cisco APs.
	summary	Shows configuration and statistics of 802.11b and 802.11a Cisco APs.

Command Default None

Command Modes User EXEC command mode or Privileged EXEC command mode

Usage Guidelines None.

The following is a sample output of the **show ap dot11 24ghz media-stream rrc** command.

```
Device#show ap dot11 24ghz media-stream rrc

Multicast-direct                : Disabled
Best Effort                     : Disabled
Video Re-Direct                 : Disabled
Max Allowed Streams Per Radio    : Auto
Max Allowed Streams Per Client   : Auto
Max Video Bandwidth             : 0
Max Voice Bandwidth             : 75
Max Media Bandwidth             : 85
Min PHY Rate (Kbps)             : 6000
Max Retry Percentage            : 80
```

show ap dot11 24ghz

To display the 2.4 GHz RRM parameters, use the **show ap dot11 24ghz** command.

show ap dot11 24ghz {**ccx** | **channel** | **coverage** | **group** | **l2roam** | **logging** | **monitor** | **profile** | **receiver** | **summary** | **txpower**}

Syntax Description

ccx	Displays the 802.11b CCX information for all Cisco APs.
channel	Displays the configuration and statistics of the 802.11b channel assignment.
coverage	Displays the configuration and statistics of the 802.11b coverage.
group	Displays the configuration and statistics of the 802.11b grouping.
l2roam	Displays 802.11b l2roam information.
logging	Displays the configuration and statistics of the 802.11b event logging.
monitor	Displays the configuration and statistics of the 802.11b monitoring.
profile	Displays 802.11b profiling information for all Cisco APs.
receiver	Displays the configuration and statistics of the 802.11b receiver.
summary	Displays the configuration and statistics of the 802.11b Cisco APs.
txpower	Displays the configuration and statistics of the 802.11b transmit power control.

Command Default   None.

Command Modes   Global configuration.

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   None.

This example shows how to display configuration and statistics of the 802.11b coverage.

```
Device#show ap dot11 24ghz coverage

Coverage Hole Detection
  802.11b Coverage Hole Detection Mode            : Enabled
  802.11b Coverage Voice Packet Count             : 100 packet(s)
  802.11b Coverage Voice Packet Percentage        : 50%
  802.11b Coverage Voice RSSI Threshold           : -80 dBm
  802.11b Coverage Data Packet Count              : 50 packet(s)
  802.11b Coverage Data Packet Percentage         : 50%
  802.11b Coverage Data RSSI Threshold            : -80 dBm
```

```
802.11b Global coverage exception level        : 25 %
802.11b Global client minimum exception level  : 3 clients
```

show ap dot11 24ghz SI config

To see the spectrum intelligence (SI) configuration details for the 2.4-GHz band, use the **show ap dot11 24ghz SI config** command.

show ap dot11 24ghz SI config [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	*chassis-number*	Chassis number as either 1 or 2.
	active R0	Active instance of the configuration in Route-processor slot 0.
	standby R0	Standby instance of the configuration in Route-processor slot 0.

Command Default	None

Command Modes	Privileged EXEC

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the SI configuration details for the 2.4-GHz band:

```
Device# show ap dot11 24ghz SI config chassis 1 R0
```

show ap dot11 24ghz SI device type

To see the spectrum intelligence (SI) interferers of different types for the 2.4-GHz band, use the **show ap dot11 24ghz SI device type** command.

show ap dot11 24ghz SI device type {**cont_tx** | **mw_oven** | **si_fhss**} [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description		
cont_tx		SI interferers of type Continuous transmitter for the 2.4-GHz band.
mw_oven		SI interferers of type microwave oven for the 2.4-GHz band.
si_fhss		SI interferers of type Frequency Hopping Spread Spectrum for the 2.4-GHz band.
chassis-number		Enter the chassis number as either 1 or 2.
active R0		Active instance of the configuration in Route-processor slot 0.
standby R0		Standby instance of the configuration in Route-processor slot 0.

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the details of SI interferers of type microwave oven in the 2.4-GHz band:

```
Device# show ap dot11 24ghz SI device type mw_oven chassis 1 R0
```

show ap dot11 5ghz

To display the 5GHz RRM parameters, use the **show ap dot11 5ghz** command.

show ap dot11 5ghz {**ccx** | **channel** | **coverage** | **group** | **l2roam** | **logging** | **monitor** | **profile** | **receiver** | **summary** | **txpower**}

Syntax Description		
	ccx	Displays the 802.11a CCX information for all Cisco APs.
	channel	Displays the configuration and statistics of the 802.11a channel assignment.
	coverage	Displays the configuration and statistics of the 802.11a coverage.
	group	Displays the configuration and statistics of the 802.11a grouping.
	l2roam	Displays 802.11a l2roam information.
	logging	Displays the configuration and statistics of the 802.11a event logging.
	monitor	Displays the configuration and statistics of the 802.11a monitoring.
	profile	Displays 802.11a profiling information for all Cisco APs.
	receiver	Displays the configuration and statistics of the 802.11a receiver.
	summary	Displays the configuration and statistics of the 802.11a Cisco APs.
	txpower	Displays the configuration and statistics of the 802.11a transmit power control.

Command Default   None.

Command Modes   Global configuration.

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   None.

This example shows configuration and statistics of 802.11a channel assignment.

```
Device#show ap dot11 5ghz channel

Automatic Channel Assignment
  Channel Assignment Mode                      : AUTO
  Channel Update Interval                      : 12 Hours
  Anchor time (Hour of the day)                : 20
  Channel Update Contribution                  : SNI..
  Channel Assignment Leader                    : web (9.9.9.2)
  Last Run                                     : 16534 seconds ago
  DCA Sensitivity Level                        : MEDIUM (15 dB)
  DCA 802.11n Channel Width                    : 40 Mhz
```

```
Channel Energy Levels
    Minimum                                  : unknown
    Average                                  : unknown
    Maximum                                  : unknown
Channel Dwell Times
    Minimum                                  : unknown
    Average                                  : unknown
    Maximum                                  : unknown
802.11a 5 GHz Auto-RF Channel List
Allowed Channel List                         : 36,40,44,48,52,56,60,64,149,153,1

            57,161
Unused Channel List                          : 100,104,108,112,116,132,136,140,1

            65
802.11a 4.9 GHz Auto-RF Channel List
Allowed Channel List                         :
Unused Channel List                          : 1,2,3,4,5,6,7,8,9,10,11,12,13,14,

            15,16,17,18,19,20,21,22,23,24,25,26
DCA Outdoor AP option                        : Disabled
```

show ap dot11 24ghz cleanair air-quality

To display the air-quality summary information and air-quality worst information for the 802.11 networks, use the **show ap dot11 cleanair** command.

show ap dot11 {**24ghz** | **5ghz** | **dual-band**} **cleanair** {**air-quality** | **config** | **device** | **summary**}

Syntax Description		
	24ghz	Displays the 2.4 GHz band.
	5ghz	Displays the 5 GHz band.
	dual-band	Displays 802.11 dual-band radios.
	cleanair	Displays cleanair configurations.
	air-quality	Displays the Cleanair Air-Quality (AQ) data for 2.4GHz band.
	device	Displays the CleanAir Interferers of device for 2.4GHz band.
	config	Displays CleanAir Configuration for 2.4GHz band.
	summary	Displays cleanair configurations for all 802.11a Cisco APs.

Command Default   None

Command Modes   Any command mode

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to display the worst air-quality information for the 5 GHz band:

```
Device# show ap dot11 5ghz cleanair air-quality worst

AQ = Air Quality
DFS = Dynamic Frequency Selection
AP Name      Channel Avg AQ Min AQ Interferers DFS
------------ ------- ------ ------ ----------- -----
CISCO_AP3500 36      95     70     0           40
```

This example shows how to display the worst air-quality information for the 2.4 GHz band:

```
Device# show ap dot11 24ghz cleanair air-quality worst

AQ = Air Quality
DFS = Dynamic Frequency Selection
AP Name      Channel Avg AQ Min AQ Interferers DFS
------------ ------- ------ ------ ----------- -----
CISCO_AP3500 1       83     57     3           5
```

show ap dot11 24ghz cleanair air-quality

To display the air-quality summary information and air-quality worst information for the 802.11 networks, use the **show ap dot11 cleanair air-quality** command.

show ap dot11 {**24ghz** | **5ghz**} **cleanair air-quality** {**summary** | **worst**}

Syntax Description		
24ghz	Displays the 2.4 GHz band.	
5ghz	Displays the 5 GHz band.	
summary	Displays a summary of 802.11 radio band air-quality information.	
worst	Displays the worst air-quality information for 802.11 networks.	

Command Default   None

Command Modes   Any command mode

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to display the worst air-quality information for the 5 GHz band:

```
Device# show ap dot11 5ghz cleanair air-quality worst

AQ = Air Quality
DFS = Dynamic Frequency Selection
AP Name      Channel Avg AQ Min AQ Interferers DFS
------------ ------- ------ ------ ----------- -----
CISCO_AP3500 36      95     70     0           40
```

This example shows how to display the worst air-quality information for the 2.4 GHz band:

```
Device# show ap dot11 24ghz cleanair air-quality worst

AQ = Air Quality
DFS = Dynamic Frequency Selection
AP Name      Channel Avg AQ Min AQ Interferers DFS
------------ ------- ------ ------ ----------- -----
CISCO_AP3500 1       83     57     3           5
```

show ap dot11 cleanair config

To display the CleanAir configuration for the 802.11 networks, use the **show ap dot11 cleanair config** command.

show ap dot11 {24ghz | 5ghz} cleanair config

Syntax Description

24ghz	Displays the 2.4 GHz band.
5ghz	Displays the 5 GHz band.

Command Default   None

Command Modes   Any command mode

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to display the CleanAir configuration for the 2.4 GHz band:

```
Device# show ap dot11 24ghz cleanair config
Clean Air Solution............................... : Disabled
Air Quality Settings:
    Air Quality Reporting........................ : Disabled
    Air Quality Reporting Period (min)........... : 15
    Air Quality Alarms........................... : Enabled
    Air Quality Alarm Threshold.................. : 10
Interference Device Settings:
    Interference Device Reporting................ : Enabled
        Bluetooth Link........................... : Enabled
        Microwave Oven........................... : Enabled
        802.11 FH................................ : Enabled
        Bluetooth Discovery...................... : Enabled
        TDD Transmitter.......................... : Enabled
        Jammer................................... : Enabled
        Continuous Transmitter................... : Enabled
        DECT-like Phone.......................... : Enabled
        Video Camera............................. : Enabled
        802.15.4................................. : Enabled
        WiFi Inverted............................ : Enabled
        WiFi Invalid Channel..................... : Enabled
        SuperAG.................................. : Enabled
        Canopy................................... : Enabled
        Microsoft Device......................... : Enabled
        WiMax Mobile............................. : Enabled
        WiMax Fixed.............................. : Enabled
    Interference Device Types Triggering Alarms:
        Bluetooth Link........................... : Disabled
        Microwave Oven........................... : Disabled
        802.11 FH................................ : Disabled
        Bluetooth Discovery...................... : Disabled
        TDD Transmitter.......................... : Disabled
        Jammer................................... : Disabled
        Continuous Transmitter................... : Disabled
        DECT-like Phone.......................... : Disabled
```

```
                    Video Camera.............................. : Disabled
                    802.15.4.................................. : Disabled
                    WiFi Inverted............................. : Enabled
                    WiFi Invalid Channel...................... : Enabled
                    SuperAG................................... : Disabled
                    Canopy.................................... : Disabled
                    Microsoft Device.......................... : Disabled
                    WiMax Mobile.............................. : Disabled
                    WiMax Fixed............................... : Disabled
               Interference Device Alarms.................... : Enabled
          Additional Clean Air Settings:
               CleanAir Event-driven RRM State.............. : Disabled
               CleanAir Driven RRM Sensitivity.............. : LOW
               CleanAir Persistent Devices state............ : Disabled
```

show ap dot11 cleanair summary

To view CleanAir configurations for all 802.11a Cisco APs, use the **show ap dot11 cleanair summary** command.

show ap dot11 {**24ghz** | **5ghz**} **cleanair summary**

Syntax Description		
24ghz	Specifies the 2.4-GHz band	
5ghz	Specifies the 5-GHz band	
cleanair summary	Summary of CleanAir configurations for all 802.11a Cisco APs	

Command Default   None

Command Modes   Any command mode

Command History

Release	Modification
	This command was introduced.

show ap dot11 dual-band summary

To view a brief summary of access points with dual-band radios, use the **show ap dot11 dual-band summary** command.

show ap dot11 dual-band summary

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Example

The following example shows how to view brief summary of tag names:

```
Device# show ap dot11 dual-band summary
```

show ap environment

To see the AP environment information of all APs, use the **show ap environment** command.

show ap environment [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	*chassis-number*	Enter the chassis number as either 1 or 2.
	active R0	Active instance of the AP filters in Route-processor slot 0.
	standby R0	Standby instance of the AP filters in Route-processor slot 0.

Command Default	None

Command Modes	Privileged EXEC

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the AP environment information:

```
Device# show ap environment
```

show ap filters active

To see the details of active AP filters, use the **show ap filters active** command.

show ap filters active [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description

chassis-number	Chassis number as either 1 or 2.
active R0	Active instance of the active AP filters in Route-processor slot 0.
standby R0	Standby instance of the active AP filters in Route-processor slot 0.

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the details of the active AP filters for the active instance:

```
Device# show ap filters active chassis active R0
```

show ap filters active type priming

To display the list of all the active priming filters, use the **show ap filters active type priming** command.

show ap filters active type priming

Syntax Description   This command has no arguments or keywords.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.2	This command was introduced.

Examples   The following example shows how to display the list of all the active priming filters:

```
Device# show ap filters active type priming

Priority   Filter Name                      regex                           Priming profile

-------------------------------------------------------------------------------------------------

0          FLR2                             *AP-FLOOR-2*                    AP-PRIMING-2


1          FLR1                             *AP-FLOOR-1*                    AP-PRIMING-1
```

show ap filters all

To see the details of all AP filters, use the **show ap filters all** command.

show ap filters all [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	*chassis-number*	Enter the chassis number as either 1 or 2.
	active R0	Active instance of the AP filters in Route-processor slot 0.
	standby R0	Standby instance of the AP filters in Route-processor slot 0.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the details of all the AP filters for the active instance:

```
Device# show ap filters all chassis active R0
```

show ap filters all type priming

To display the list of all the priming filters, use the **show ap filters all type priming** command.

show ap filters all type priming

Syntax Description   This command has no arguments or keywords.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.2	This command was introduced.

Examples   The following example shows how to display the list of all the priming filters:

```
Device# show ap filters all type priming

Filter Name                     regex                                          Priming profile
--------------------------------------------------------------------------------------------
FLR1                            *AP-FLOOR-1*                                   AP-PRIMING-1

FLR2                            *AP-FLOOR-2*                                   AP-PRIMING-2
```

show ap fra

To see the flexible radio assignment (FRA) configurations in APs, use the **show ap fra** command.

show ap fra [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	*chassis-number*	Chassis number as either 1 or 2.
	active R0	Active instance in Route-processor slot 0.
	standby R0	Standby instance in Route-processor slot 0.

Command Default	None

Command Modes	Privileged EXEC

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the FRA configurations in APs:

```
Device# show ap fra
```

show ap fra 5-6ghz

To view the Flexible Radio Assignment (FRA) 5/6-GHz configurations, use the **show ap fra 5-6ghz** command.

show ap fra 5-6ghz

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC #

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

This example shows how to view the Flexible Radio Assignment (FRA) 5/6-GHz configurations:

```
Device# show ap fra 5-6ghz
```

show ap gps location

To see the GPS location of all APs, use the **show ap gps location** command.

show ap gps location [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description

chassis-number	Enter the chassis number as either 1 or 2.
active R0	Active instance of the AP filters in Route-processor slot 0.
standby R0	Standby instance of the AP filters in Route-processor slot 0.

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the GPS location of all APs:

```
Device# show ap gps location
```

show ap grpc summary

To display the status summary of GRPC channel from the AP to Cisco DNA, use the **show ap grpc summary** command.

show ap grpc summary

Syntax Description	This command has no arguments.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Usage Guidelines None

Example

The following example shows how to display the status summary of GRPC channel from the AP to Cisco DNA:

```
Device(config)# show ap grpc summary
```

show ap group hyperlocation

To view a summary or detailed information of Hyperlocation configuration for an AP group, use the **show ap group** *ap-group-name* **hyperlocation** command.

show ap group hyperlocation {**summary** | **detail**}

Syntax Description	**summary**	Shows the overall configuration values (AP group specific) and operational status and parameters for the AP group.
	detail	Shows both overall (AP group specific) and per-AP configuration values and operational status for the AP group. The APs listed are only those that belong to the AP group.

Command Modes	User EXEC
	Privileged EXEC

Command History	**Release**	**Modification**
	Cisco IOS XE Denali 16.3.1	This command was introduced.

This example shows how to view a summary of Hyperlocation configuration for an AP group:

```
Device# show ap group my-ap-group hyperlocation summary

Site Name: my-ap-group
Site Description: This is an AP group
Hyperlocation operational status: Up
Reason: N/A
Hyperlocation NTP server: 9.0.0.4
Hyperlocation admin status: Enabled
Hyperlocation detection threshold: -100 dBm
Hyperlocation trigger threshold: 11
Hyperlocation reset threshold: 9
```

> **Note** For Hyperlocation to be operational, the following conditions must be met:
>
> • At least one Cisco CMX with Hyperlocation enabled
>
> • Hyperlocation admin state operational
>
> • Either AP NTP or IOS NTP configured

This example shows how to view detailed information about Hyperlocation configuration for an AP group:

```
Device# show ap group my-ap-group hyperlocation detail

Site Name: my-ap-group
Site Description: This is an AP group
Hyperlocation operational status: Up
Reason: N/A
Hyperlocation NTP server: 9.0.0.4
Hyperlocation admin status: Enabled
Hyperlocation detection threshold: -100 dBm
Hyperlocation trigger threshold: 11
Hyperlocation reset threshold: 9

Values for APs in all AP Groups:

AP Name                 Radio MAC       Method     Hyperlocation
-------------------------------------------------------------
APf07f.0635.2d40        f07f.0676.3b89  WSM        Enabled
APf4cf.e272.4ed0        f4cf.e223.ba31  Local      Enabled
```

show history channel interface dot11Radio all

To check channel change or trigger reason and history, use the **show history channel interface dot11Radio all** command.

show history channel interface dot11Radio all

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Examples

This example shows how to check channel change or trigger reason and history:

```
Device# show history channel interface dot11Radio all

                Timestamp Slot Client count Channel Trigger
Fri May 31 12:57:04 2019   0            0      11 RRM-DCA
Fri May 31 13:10:02 2019   0            0       1 RRM-DCA
Fri May 31 12:57:04 2019   1            0      60  Manual
Fri May 31 13:00:16 2019   1            0     149     DFS
```

show ap hyperlocation

To view a summary or detailed information about the hyperlocation configuration, use the **show ap hyperlocation** command.

show ap hyperlocation {**summary** | **detail**}

Syntax Description	**summary**	Shows the overall configuration and operational values.
	detail	Shows the overall configuration and operation values as well as detailed information about each AP.

Command Default	None

Command History	Release	Modification
	Cisco IOS XE Denali 16.2.1	This command was introduced.
	Cisco IOS XE Denali 16.3.1	This command was modified. The **ble-beacon** keyword was added.

Usage Guidelines For hyperlocation to be operational, the following conditions must be met:

- At least one Cisco Connected Mobile Experiences (CMX) must be present with hyperlocation enabled.

- The hyperlocation admin state should be operational.

- Either AP Network Time Protocol (NTP) or IOS NTP should be configured.

Example

This example shows how to view a summary of the hyperlocation configuration:

```
Device# show ap hyperlocation summary

Hyperlocation operational status: Up
Hyperlocation NTP server currently used: 9.0.0.4
Hyperlocation admin status: Enabled
Hyperlocation detection threshold: -100 dBm
Hyperlocation trigger threshold: 10
Hyperlocation reset threshold: 8
```

This example shows how to view detailed information about hyperlocation configuration:

```
Device# show ap hyperlocation detail

Hyperlocation operational status: Up
Hyperlocation NTP server currently used: 9.0.0.4
Hyperlocation admin status: Enabled
Hyperlocation detection threshold: -100 dBm
Hyperlocation trigger threshold: 10
Hyperlocation reset threshold: 8
```

```
AP Name                  Radio MAC          Method     Hyperlocation
--------------------------------------------------------------------
AP84b8.0252.b930         84b8.0216.c721     HALO       Enabled
AP84b8.0265.5540         84b8.0243.8796     WSM        Enabled
APf07f.0635.2d40         f07f.0676.3b89     WSM        Enabled
APf4cf.e272.4ed0         f4cf.e223.ba31     HALO       Enabled
```

show ap hyperlocation cmx summary

To see a summary of CMX informaiton with Hyperlocation enabled, use the **show ap hyperlocation cmx summary** command.

show ap hyperlocation cmx summary [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	*chassis-number*	Enter the chassis number as either 1 or 2.
	active R0	Active instance of the AP filters in Route-processor slot 0.
	standby R0	Standby instance of the AP filters in Route-processor slot 0.

Command Default	None

Command Modes	Privileged EXEC

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see a summary of CMX informaiton with Hyperlocation enabled:

```
Device# show ap hyperlocation cmx summary
```

show ap image

To display the images present on Cisco lightweight access points, use the **show ap image** command.

show ap image

Syntax Description

This command has no keywords and arguments.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to display images on the access points:

```
Device# show ap image
```

show ap image file summary

To see the summary of an access point's (AP) software install files, use the **show ap image file summary** command.

show ap image file summary

Syntax Description	This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.4.1	This command was modified.

Example

The following example shows how to display the summary of an AP's software install files:

```
Device# show ap image file summary
AP Image Active List
===========================
Install File Name: base_image.bin
-------------------------------
AP Image Type    Capwap Version Size (KB) Supported AP models
-------------------------------------------------------------------------------------------------------

       ap1g1        17.3.0.30        13300  NA

       ap1g2        17.3.0.30  34324       NA

       ap1g3        17.3.0.30  98549       AP803

       ap1g4        17.3.0.30        34324       AP1852E, AP1852I, AP1832I, AP1830I, AP1810W,
OEAP1810

       ap1g5        17.3.0.30        23492       AP1815W, AP1815T, OEAP1815, AP1815I, AP1800I,
AP1800S, AP1815M, 1542D, AP1542I, AP1100AC, AP1101AC, AP1840I

       ap1g6        17.3.0.30  93472               AP2900I, C9117AXI

       ap1g6a       17.3.0.30  247377              C9130AXI, C9130AXE, C9140AXI, C9140AXD,
C9140AXT

       ap1g7        17.3.0.30  23988           AP1900I, C9115AXI, AP1900E, C9115AXE, C9120AXE,
C9120AXP, C9120AXI

       ap1g8        17.3.0.30  23473       C9105AXI, C9105AXW, C9110AXI, C9110AXE

       ap3g1        17.3.0.30  23422        NA

       ap3g2        17.3.0.30  23411  AP1702I
```

```
     ap3g3       17.3.0.30   23090  AP3802E, AP3802I, AP3802P, AP4800, AP2802E, AP2802I,
AP2802H, AP3800, AP1562E, AP1562I, AP1562D, AP1562PS, IW-6300H-DC, IW-6300H-AC, IW-6300H-DCW,
 ESW-6300

     c1570       17.3.0.30   13000  AP1572E, 1573E, AP1572I

     c3700       17.3.0.30   14032  AP3702E, AP3701E, AP3701I, AP3702I, AP3701P, AP3702P,
AP2702E, AP2702I, AP3702, IW3702, AP3701, AP3700C

 virtApImg      17.3.0.30               177056      APVIRTUAL


AP Image Prepare List**
============================
Install File Name: base_image.bin
-----------------------------
============================
Install File Name: base_image.bin
-----------------------------
AP Image Type    Capwap Version Size (KB) Supported AP models
----------------------------------------------------------------------------------------------
     ap1g1       17.3.0.30        13300  NA

     ap1g2       17.3.0.30   34324  NA

     ap1g3       17.3.0.30   98549  AP803

     ap1g4       17.3.0.30        34324  AP1852E, AP1852I, AP1832I, AP1830I, AP1810W,
OEAP1810

     ap1g5       17.3.0.30        23492  AP1815W, AP1815T, OEAP1815, AP1815I, AP1800I,
AP1800S, AP1815M, 1542D, AP1542I, AP1100AC, AP1101AC, AP1840I

     ap1g6       17.3.0.30   93472                 AP2900I, C9117AXI

     ap1g6a      17.3.0.30   247377                C9130AXI, C9130AXE, C9140AXI, C9140AXD,
C9140AXT

     ap1g7       17.3.0.30   23988                 AP1900I, C9115AXI, AP1900E, C9115AXE,
C9120AXE, C9120AXP, C9120AXI

     ap1g8       17.3.0.30   23473    C9105AXI, C9105AXW, C9110AXI, C9110AXE

     ap3g1       17.3.0.30   23422     NA

     ap3g2       17.3.0.30   23411     AP1702I

     ap3g3       17.3.0.30   23090     AP3802E, AP3802I, AP3802P, AP4800, AP2802E, AP2802I,
AP2802H, AP3800, AP1562E, AP1562I, AP1562D, AP1562PS, IW-6300H-DC, IW-6300H-AC, IW-6300H-DCW,
ESW-6300

     c1570       17.3.0.30   13000     AP1572E, 1573E, AP1572I

     c3700       17.3.0.30   14032     AP3702E, AP3701E, AP3701I, AP3702I, AP3701P, AP3702P,
AP2702E, AP2702I, AP3702, IW3702, AP3701, AP3700C

 virtApImg      17.3.0.30               177056      APVIRTUAL

**Difference of Active and Prepare list gives images being predownloaded to Access Points.
```

show ap image site summary

To see the summary of an access point's (AP) site-filtered upgrades, use the **show ap image site summary** command.

show ap image site summary

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

The following example shows how to display the summary of an AP's site-filtered upgrades:

```
Device# show ap image site summary

Image name: smu1.bin
Site Tag             Prepared            Activated            Committed
--------------------------------------------------------------------------------------------------
BGL18                yes                 ongoing              no
BGL17                yes                 ongoing              no
```

show ap iot-radio firmware summary

To display the IoT radio firmware information summary of the access point, use the **show ap iot-radio firmware summary** command.

show ap iot-radio firmware summary

Syntax Description

This command has no arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Example

This example shows you how to display the IoT radio firmware information summary of the access point:

```
Device# show ap iot-radio firmware summary
```

show ap link-encryption

To display the link encryption status, use the **show ap link-encryption** command.

show ap link-encryption[**chassis** | {*chassis-number* | **active** | **standby**} | **R0**]

Syntax Description	*chassis-number*	Chassis number as either 1 or 2.
	active R0	Active instance in Route-processor slot 0.
	standby R0	Standby instance in Route-processor slot 0.

Command Default   None

Command Modes   Any command mode

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example show how to display the link-encryption status:

```
Device# show Cisco IOS XE Gibraltar 16.12.2s link-encryption
```

show ap lldp neighbors detail

To view the details of the AP Link Layer Discovery Protocol (LLDP) neighbor information on the controller, when the AP is connected to the third-party switch.

show ap lldp neighbors detail

Syntax Description	This command has no arguments.

Command Default   None

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows how to view the details of AP Link Layer Discovery Protocol (LLDP) neighbor information on the controller, when the AP is connected to the third-party switch:

```
Device# show ap lldp neighbors detail
Number of neighbors: 1
AP Name             : 9130-ap1
AP Interface        : GigabitEthernet0
-------------------------------------------------------
Neighbor MAC        : c89c.1db1.1f80
Neighbor Name       : flex-ctlr-switch
System Description   : Cisco IOS Software, C3750E Software (C3750E-UNIVERSALK9-M), Version
 15.2(4)E6, RELEASE SOFTWARE (fc4)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2018 by Cisco Systems, Inc.
Compiled Thu 05-Apr-18 02:22 by prod_rel_team
Port ID             : Gi1/0/15
Port Description     : 9130-ap2
Chassis Alias       :
Management Addresses :
  IPv4 address       : None
  IPv6 address       : None
Capabilities        :
  Bridge
  Router
Last updated time   : 12/02/2020 09:15:48
```

show ap lldp neighbors

To view the AP Link Layer Discovery Protocol (LLDP) neighbor information on the controller, when the AP is connected to the third-party switch.

show ap lldp neighbors

Syntax Description

This command has no arguments.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Usage Guidelines

None

Example

The following example shows how to view the AP Link Layer Discovery Protocol (LLDP) neighbor information on the controller, when the AP is connected to the third-party switch:

```
Device# show ap lldp neighbors
Capability Codes:
    (R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable Device
    (W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other


AP Name   AP Interface     Neighbor Name Neighbor MAC    Port ID    Mgmt. Address
Capabilities   Last updated time
-------------------------------------------------------------------------------------------------
9130-ap1  GigabitEthernet0  switch         cxxc.1dxx.1fxx  Gi1/0/15   None        B R
     12/02/2020 09:15:48

9117-ap1  GigabitEthernet0  switch         cxxc.1dxx.1fxx  Gi1/0/19   None        B R
     12/02/2020 09:15:47
```

show ap name dot11 neighbor summary

To view the neighbor summary of an access point (AP) in a 802.11 2.4-GHz, 5-GHz, or a 6-GHz network, use the **show ap name** *ap-name* **dot11 {24ghz | 5ghz | 6ghz} neighbor summary** command.

show ap name dot11 {24ghz | 5ghz | 6ghz} neighbor summary

Syntax Description

ap-name	Specifies the Name of the AP.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Examples

This example shows how to view the neighbor summary of the 802.11 2.4-GHz parameter:

```
Device# show ap name AP687D.B45C.0554 dot11 24ghz neighbor summary

BSSID           Channel Channel-width Slot  RSSI  Last-Heard           SSID       Neighbor
------------------------------------------------------------------------------------------
10f9.2077.6140    1       20 Mhz        0    -28   06/23/2021 01:42:51  mdns-psk    TRUE
10f9.2077.614f    1       20 Mhz        0    -28   06/23/2021 01:42:51  mdns-psk    TRUE
00b0.e192.9600   11       20 Mhz        0    -31   06/23/2021 01:42:51  mdns-psk    TRUE
00b0.e192.960f   11       20 Mhz        0    -31   06/23/2021 01:42:51  mdns-psk    TRUE
00ee.ab18.bf0f    6       20 Mhz        0    -38   06/23/2021 01:42:51  mdns-psk    TRUE
f4db.e69f.8860    1       20 Mhz        0    -75   06/23/2021 01:43:06  wlan1       FALSE
68ca.e43f.b902    1       20 Mhz        0    -77   06/23/2021 01:43:06  amaz-open   FALSE
68ca.e43f.b900    1       20 Mhz        0    -78   06/23/2021 01:43:06  amaz-web    FALSE
68ca.e43f.b903    1       20 Mhz        0    -78   06/23/2021 01:43:06  amaz-8021x FALSE
```

This example shows how to view the neighbor summary of the 802.11 5-GHz parameter:

```
Device# show ap name AP1117Q.B22U.0221 dot11 5ghz neighbor summary

BSSID           Channel  Channel-width  Slot RSSI Last-Heard           SSID       Neighbor
------------------------------------------------------------------------------------
7872.5dee.496f  100        80 Mhz        1    34   6/23/2021 01:43:35 mdns-psk   FALSE
```

This example shows how to view the neighbor summary of the 802.11 6-GHz parameter:

```
Device# show ap name AP1117Q.B22U.0221 dot11 6ghz neighbor summary

BSSID           Channel  Channel-width  Slot  RSSI  Last-Heard           SSID       Neighbor
------------------------------------------------------------------------------------------
```

```
687d.b45e.4c53   1        20 Mhz       3   -37   06/23/2021 01:42:51   wpa3-6ghz   TRUE
687d.b45e.53d3   1        20 Mhz       3   -39   06/23/2021 01:42:51   wpa3-6ghz   TRUE
```

show ap name lldp neighbors detail

To view the details of the AP Link Layer Discovery Protocol (LLDP) neighbor information on the controller, for a specific AP, when the AP is connected to the third-party switch.

show ap name *ap-name* **lldp neighbors detail**

Syntax Description	This command has no arguments.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows how to view the details of the AP Link Layer Discovery Protocol (LLDP) neighbor information on the controller, for a specific AP, when the AP is connected to the third-party switch:

```
Device# show ap name 9130-ap1 lldp neighbors detail
AP Name             : 9130-ap1
AP Interface        : GigabitEthernet0
--------------------------------------------------------
Neighbor MAC        : c89c.1db1.1f80
Neighbor Name       : flex-ctlr-switch
System Description   : Cisco IOS Software, C3750E Software (C3750E-UNIVERSALK9-M), Version
 15.2(4)E6, RELEASE SOFTWARE (fc4)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2018 by Cisco Systems, Inc.
Compiled Thu 05-Apr-18 02:22 by prod_rel_team
Port ID             : Gi1/0/15
Port Description    : 9130-ap2
Chassis Alias       :
Management Addresses :
  IPv4 address       : None
  IPv6 address       : None
Capabilities        :
  Bridge
  Router
Last updated time   : 12/02/2020 09:15:48
```

show ap name lldp neighbors

To view the AP Link Layer Discovery Protocol (LLDP) neighbor information on the controller, for a specific AP, when the AP is connected to the third-party switch.

show ap name *ap-name* **lldp neighbors**

Syntax Description

This command has no arguments.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Usage Guidelines

None

Example

The following example shows how to view the AP Link Layer Discovery Protocol (LLDP) neighbor information on the controller, for a specific AP, when the AP is connected to the third-party switch:

```
Device# show ap name 9130-ap1 lldp neighbors
AP Name            : 9130-ap1
AP Interface       : GigabitEthernet0
-------------------------------------------------------
Neighbor MAC       : c89c.1db1.1f80
Neighbor Name      : flex-ctlr-switch
System Description : Cisco IOS Software, C3750E Software (C3750E-UNIVERSALK9-M), Version
 15.2(4)E6, RELEASE SOFTWARE (fc4)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2018    by Cisco Systems, Inc.
Compiled Thu 05-Apr-18 02:22  02:22 by prod_rel_team
Port ID            : Gi1/0/15
Port Description   : 9130-ap2
Chassis Alias      :
Management Addresses :
  IPv4 address       : None
  IPv6 address       : None
Capabilities       :
  Bridge
  Router
Last updated time  : 12/02/2020 09:15:48
```

show ap name ntp status

To display the Network Time Protocol (NTP) status of an AP, use the **show ap name ntp status** command.

show ap name *ap-name* **ntp status**

Syntax Description

ap-name	AP name.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Examples

The following example shows how to view the NTP status of an AP:

```
Device# show ap name AP-G1-230 ntp status

ap-name      enabled v4/v6 IPAddress      Status    Stratum LastSync  SyncOffset
AP-G1-230    Y       v4    198.51.100.5   AuthFail  4       1000      100
```

show ap ntp status

To display the Network Time Protocol (NTP) status for all the APs, use the **show ap name ntp status** command.

show ap ntp status

Syntax Description This command has no keywords and arguments.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Examples The following example shows how to view the NTP status for all the APs:

```
Device# show ap ntp status

ap-name        enabled    v4/v6 IPAddress      Status   Stratum LastSync SyncOffset
AP-G1-230         Y        v4    198.51.100.5   AuthFail 2       Never
AP-G1-231         Y        v4    198.51.100.10  Synced   3       1000     100
AP-G1-232         Y        v4    198.51.100.15  Synced   16      2000     50
```

show ap primary list

To see the AP primary list, use the **show ap primary list** command.

show **ap** **primary** **list** [**chassis** | { *chassis-number* | **active** | **standby** } | **R0**]

Syntax Description

chassis-number	Chassis number as either 1 or 2.
active R0	Active instance in Route-processor slot 0.
standby R0	Standby instance in Route-processor slot 0.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the AP primary list:

```
Device# show ap primary list
```

show ap mesh cac access

To view the number of active calls on access radio for a given AP and its Mesh tree, use **show ap mesh cac access** command.

show ap *ap-name* **mesh cac access**

Syntax Description

ap-name	Name of the access point.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Usage Guidelines

Example

This example shows how to display the number of active calls on access radio for a given AP and its Mesh tree:

```
Device# show ap <ap-name> mesh cac access

Depth   AP Name                           Slot  Radio      BW Used  Call
------  --------------------------------  ----  ---------  -------  ----
0       AALUKKAL-1562-RAP                 0     802.11b/g  0        0
                                          1     802.11a    0        0
1       AP380E.4DBF.C6B0                  0     802.11b/g  1072     2
                                          1     802.11a    0        0
```

show ap mesh cac bwused voice

To view the voice bandwidth utilization of a given AP and its Mesh tree, use the **show ap mesh cac bwused voice** command.

show ap *ap-name* **mesh cac bwused voice**

Syntax Description	*ap-name*	Name of the access point.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Usage Guidelines

Example

This example shows how to display the voice bandwidth utilization of a given AP and its Mesh tree:

```
Device# show ap <ap-name> mesh cac bwused voice

Depth   AP Name                            Slot  Radio      BW Used
------  ---------------------------------  ----  ---------  -------
1       APA023.9FA9.D920                   0     802.11b/g  1140
                                           1     802.11a    0
2       AP380E.4DBF.C80C                   0     802.11b/g  570
                                           1     802.11a    2144
2       AP380E.4DBF.C816                   0     802.11b/g  0
                                           1     802.11a    0
2       APA023.9FA9.B702                   0     802.11b/g  0
                                           1     802.11a    0
```

show ap mesh cac callpath

To view the number of active calls in access as well as backhaul for a given AP and its Mesh tree, use the **show ap mesh cac callpath** command.

show ap *ap-name* **mesh cac callpath**

| **Syntax Description** | *ap-name* | Name of the access point. |

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Usage Guidelines

Example

This example shows how to display the number of active calls in access as well as backhaul for a given AP and its Mesh tree:

```
Device# show ap <ap-name> mesh cac callpath

Depth   AP Name                          Slot  Radio      Call
------  -------------------------------  ----  ---------  ----
1       APA023.9FA9.D920                 0     802.11b/g  2
                                         1     802.11a    0
2       AP380E.4DBF.C80C                 0     802.11b/g  0
                                         1     802.11a    2
2       AP380E.4DBF.C816                 0     802.11b/g  0
                                         1     802.11a    0
2       APA023.9FA9.B702                 0     802.11b/g  0
                                         1     802.11a    0
```

show ap mesh cac rejected

To view the number of rejected calls on access as well as backhaul for a given AP and its Mesh tree, use **show ap mesh cac rejected** command.

show ap *ap-name* **mesh cac rejected**

Syntax Description	*ap-name*	Name of the access point.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Usage Guidelines

Example

This example shows how to display the number of rejected calls on access as well as backhaul for a given AP and its Mesh tree:

```
Device# show ap <ap-name> mesh cac rejected
```

show ap monitor-mode summary

To display the current channel-optimized monitor mode settings, use the **show ap monitor-mode summary** command.

show ap monitor-mode summary

Syntax Description This command has no keywords and arguments.

Command Default None

Command Modes Any command mode

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to display current channel-optimized monitor mode settings:

```
Device# show ap monitor-mode summary

AP Name Ethernet MAC       Status    Scanning Channel List
------- -------------      --------  -------- ----------------
AP_004  xx:xx:xx:xx:xx:xx  Tracking  1,6,11,  4
```

show ap multicast mom (multicast over multicast)

To confirm if the APs receive multicast to multicast (mom) traffic sent by the controller, using CAPWAP multicast group, use the **show ap multicast mom** command.

Syntax Description

This command has no keywords and arguments.

Command Default

None

Command Modes

Previleged EXEC

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2	This command was introduced.

This example shows how to confirm if the APs receive multicast to multicast traffic sent by the controller using CAPWAP multicast group:

```
Device# show ap multicast mom

AP Name                    MOM-IP    TYPE MOM- STATUS
-----------------------------------------------------
SS-E-1                     IPv4           Up
SS-E-2                     IPv4           Up
9130E-r3-sw2-g1012         IPv4           Up
9115i-r3-sw2-te1-0-38      IPv4           Up
AP9120-r3-sw3-Gi1-0-46     IPv4           Up
ap3800i-r2-sw1-te2-0-2     IPv4           Up
```

show ap name *ap-name* neighbor summary

To view the summary of AP neighbor information, use the **show ap name** *ap-name* **neighbor summary**

show ap name *ap-name* **neighbor summary**

Syntax Description	*ap-name* Specifies the name of the AP whose neighbor summary is displayed.

Command Default None

Command Modes Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Example

This example shows how to display the AP neighbor information:

```
Device#show ap name APXXXX.6DXX.59XX neighbor summary

BSSID              Channel    Channel-width Slot      RSSI          Last-Heard
                   SSID                                   Neighbour
--------------------------------------------------------------------------------------
0008.2f1c.8040     1       20 Mhz       0         -39           03/17/2020
18:25:14           aprusty-un-dot1x                      FALSE
0008.2f1c.8041     1       20 Mhz       0         -39           03/17/2020
18:25:14           aprusty-sim-11                        FALSE
0008.2f1c.8042     1       20 Mhz       0         -39           03/17/2020
18:25:14           one-ph                                FALSE
0008.2f1c.8044     1       20 Mhz       0         -38           03/17/2020
18:25:14           aprusty-test                          FALSE
0008.3296.f340     11      20 Mhz       0         -51           03/18/2020
10:39:27           ewlc-ap-dot1x                         FALSE
0008.3296.f341     11      20 Mhz       0         -49           03/18/2020
10:39:27           vewlc_small_psk                       FALSE
002a.1022.d950     1       20 Mhz       0         -57           03/17/2020
18:25:14           ewlc-ap-dot1x                         FALSE
002a.105c.bfd0     1       20 Mhz       0         -36           03/17/2020
18:25:14           ewlc-ap-dot1x                         FALSE
002a.105c.bfd1     1       20 Mhz       0         -37           03/17/2020
18:25:14           vewlc_small_psk                       FALSE
002c.c864.76d0     11      20 Mhz       0         -61           03/18/2020
10:37:37           rajwlan                               FALSE

BSSID              Channel    Channel-width Slot      RSSI          Last-Heard
                   SSID                                   Neighbour
--------------------------------------------------------------------------------------
002c.c8de.59e0     1       20 Mhz       0         -48           03/17/2020
18:25:14           WQ                                    FALSE
002c.c8de.5d80     11      20 Mhz       0         -54           03/18/2020
10:39:27           ewlc-ap-dot1x                         FALSE
002c.c8de.5d81     11      20 Mhz       0         -55           03/18/2020
10:39:27           vewlc_small_psk                       FALSE
```

```
002c.c8de.7260        11        20 Mhz        0        -53                    03/18/2020
10:39:27             ewlc-ap-dot1x                          FALSE
002c.c8de.7261        11        20 Mhz        0        -54                    03/18/2020
10:39:27             vewlc_small_psk                        FALSE
005d.7390.e1e0        1         20 Mhz        0        -54                    03/17/2020
18:25:14             rlan                                   FALSE
006b.f114.95a0        1         20 Mhz        0        -60                    03/17/2020
18:25:14             zavc                                   FALSE
006b.f114.b0e0        1         20 Mhz        0        -46                    03/17/2020
18:25:14             ewlc-ap-dot1x                          FALSE
006c.bc61.2340        1         20 Mhz        0        -63                    03/17/2020
18:24:44             dnac-swim                              FALSE
006c.bc72.5ce0        11        20 Mhz        0        -58                    03/18/2020
10:39:17             dnac-swim                              FALSE
```

show ap name auto-rf

To display the auto-RF settings for a Cisco lightweight access point, use the **show ap name auto-rf** command.

show ap name *ap-name* **auto-rf dot11** {**24ghz** | **5ghz** | **dual-band**}

Syntax Description	*ap-name*	Name of the Cisco lightweight access point.
	24ghz	Displays the 2.4 GHz band.
	5ghz	Displays the 5 GHz band.
	dual-band	Displays dual band.

Command Default   None

Command Modes   Privileged EXEC.

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to display auto-RF information for an access point:

```
Device# show ap name AP01 auto-rf dot11 24ghz

Number of Slots                                : 2
AP Name                                        : TSIM_AP-1
MAC Address                                    : 0000.2000.02f0
Slot ID                                        : 0
Radio Type                                     : 802.11b/g
Subband Type                                   : All

Noise Information
  Noise Profile                                : Failed
  Channel   1                                  :    24 dBm
  Channel   2                                  :    48 dBm
  Channel   3                                  :    72 dBm
  Channel   4                                  :    96 dBm
  Channel   5                                  :   120 dBm
  Channel   6                                  :  -112 dBm
  Channel   7                                  :   -88 dBm
  Channel   8                                  :   -64 dBm
  Channel   9                                  :   -40 dBm
  Channel  10                                  :   -16 dBm
  Channel  11                                  :     8 dBm

Interference Information
  Interference Profile                         : Passed
  Channel   1                                  : -128 dBm @  0% busy
  Channel   2                                  :  -71 dBm @  1% busy
  Channel   3                                  :  -72 dBm @  1% busy
  Channel   4                                  :  -73 dBm @  2% busy
  Channel   5                                  :  -74 dBm @  3% busy
  Channel   6                                  :  -75 dBm @  4% busy
  Channel   7                                  :  -76 dBm @  5% busy
```

```
       Channel   8                                        :   -77 dBm @  5% busy
       Channel   9                                        :   -78 dBm @  6% busy
       Channel  10                                        :   -79 dBm @  7% busy
       Channel  11                                        :   -80 dBm @  8% busy

     Rogue Histogram (20/40_ABOVE/40_BELOW)
       Channel  36                                        : 27/ 4/ 0
       Channel  40                                        : 13/ 0/ 0
       Channel  44                                        :  5/ 0/ 0
       Channel  48                                        :  6/ 0/ 1
       Channel  52                                        :  4/ 0/ 0
       Channel  56                                        :  5/ 0/ 0
       Channel  60                                        :  1/ 3/ 0
       Channel  64                                        :  3/ 0/ 0
       Channel 100                                        :  0/ 0/ 0
       Channel 104                                        :  0/ 0/ 0
       Channel 108                                        :  0/ 1/ 0

     Load Information
       Load Profile                                       : Passed
       Receive Utilization                                : 10%
       Transmit Utilization                               : 20%
       Channel Utilization                                : 50%
       Attached Clients                                   : 0 clients

     Coverage Information
       Coverage Profile                                   : Passed
       Failed Clients                                     : 0 clients

     Client Signal Strengths
       RSSI -100 dBm                                      : 0 clients
       RSSI  -92 dBm                                      : 0 clients
       RSSI  -84 dBm                                      : 0 clients
       RSSI  -76 dBm                                      : 0 clients
       RSSI  -68 dBm                                      : 0 clients
       RSSI  -60 dBm                                      : 0 clients
       RSSI  -52 dBm                                      : 0 clients

     Client Signal to Noise Ratios
       SNR    0 dB                                        : 0 clients
       SNR    5 dB                                        : 0 clients
       SNR   10 dB                                        : 0 clients
       SNR   15 dB                                        : 0 clients
       SNR   20 dB                                        : 0 clients
       SNR   25 dB                                        : 0 clients
       SNR   30 dB                                        : 0 clients
       SNR   35 dB                                        : 0 clients
       SNR   40 dB                                        : 0 clients
       SNR   45 dB                                        : 0 clients

     Nearby APs
       AP 0000.2000.0300 slot 0                           : -68 dBm on  11 (10.10.10.1)
       AP 0000.2000.0400 slot 0                           : -68 dBm on  11 (10.10.10.1)
       AP 0000.2000.0600 slot 0                           : -68 dBm on  11 (10.10.10.1)

     Radar Information

     Channel Assignment Information
       Current Channel Average Energy                     : 0 dBm
       Previous Channel Average Energy                    : 0 dBm
       Channel Change Count                               : 0
       Last Channel Change Time                           : Wed Oct 17 08:13:36 2012
       Recommended Best Channel                           : 11
```

```
RF Parameter Recommendations
  Power Level                                    : 1
  RTS/CTS Threshold                              : 2347
  Fragmentation Threshold                        : 2346
  Antenna Pattern                                : 0

Persistent Interference Devices
```

show ap name ble detail

To display BLE management details, use the **show ap name ble detail** command.

show ap name *ap-name* **ble detail**

Syntax Description

ap-name	Specifies the name of the AP.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Usage Guidelines None

Example

The following example shows how to display the BLE management details:

```
Device(config)# show ap name ap-name ble detail
```

show ap name cablemodem

To see cable modem information of an AP, use the **show ap name** *ap-name* **cablemodem** command.

show ap name *ap-name* **cablemodem** [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description		
	ap-name	Name of the AP.
	chassis-number	Enter the chassis number as either 1 or 2.
	active R0	Active instance of the AP filters in Route-processor slot 0.
	standby R0	Standby instance of the AP filters in Route-processor slot 0.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see cable modem information of an AP:

```
Device# show ap name my-ap cablemodem
```

show ap name config

To display common information and Ethernet VLAN tagging information for a specific Cisco lightweight access point, use the **show ap name config** command.

show **ap** **name** *ap-name* **config** {**ethernet** | **general**}

Syntax Description

ap-name	Name of the Cisco lightweight access point.
ethernet	Displays Ethernet tagging configuration information for an access point.
general	Displays common information for an access point.

Command Default None

Command Modes Any command mode

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to display Ethernet tagging information for an access point:

```
Device# show ap name AP01 config ethernet

VLAN Tagging Information for AP01
```

This example shows how to display common information for an access point:

```
Device# show ap name AP01 config general

Cisco AP Name                               : AP01
Cisco AP Identifier                         : 5
Country Code                                : US  - United States
Regulatory Domain Allowed by Country        : 802.11bg:-A    802.11a:-A
AP Country Code                             : US  - United States
AP Regulatory Domain                        : Unconfigured
Switch Port Number                          : Te1/0/1
MAC Address                                 : 0000.2000.02f0
IP Address Configuration                    : Static IP assigned
IP Address                                  : 10.10.10.12
IP Netmask                                  : 255.255.0.0
Gateway IP Address                          : 10.10.10.1
Fallback IP Address Being Used              : 10.10.10.12
Domain                                      : Cisco
Name Server                                 : 0.0.0.0
CAPWAP Path MTU                             : 1485
Telnet State                                : Enabled
SSH State                                   : Disabled
Cisco AP Location                           : sanjose
Cisco AP Group Name                         : default-group
Primary Cisco Controller Name               : CAPWAP Controller
Primary Cisco Controller IP Address         : 10.10.10.1
Secondary Cisco Controller Name             :
Secondary Cisco Controller IP Address       : Not Configured
```

```
Tertiary Cisco Controller Name                    :
Tertiary Cisco Controller IP Address              : Not Configured
Administrative State                              : Enabled
Operation State                                   : Registered
AP Mode                                           : Local
AP Submode                                        : Not Configured
Remote AP Debug                                   : Disabled
Logging Trap Severity Level                       : informational
Software Version                                  : 7.4.0.5
Boot Version                                      : 7.4.0.5
Stats Reporting Period                            : 180
LED State                                         : Enabled
PoE Pre-Standard Switch                           : Disabled
PoE Power Injector MAC Address                    : Disabled
Power Type/Mode                                   : Power Injector/Normal Mode
Number of Slots                                   : 2
AP Model                                          : 1140AG
AP Image                                          : C1140-K9W8-M
IOS Version                                       :
Reset Button                                      :
AP Serial Number                                  : SIM1140K001
AP Certificate Type                               : Manufacture Installed
Management Frame Protection Validation            : Disabled
AP User Mode                                      : Customized
AP User Name                                      : cisco
AP 802.1X User Mode                               : Not Configured
AP 802.1X User Name                               : Not Configured
Cisco AP System Logging Host                      : 255.255.255.255
AP Up Time                                        : 15 days 16 hours 19 minutes 57
 seconds
AP CAPWAP Up Time                                 : 4 minutes 56 seconds
Join Date and Time                                : 10/18/2012 04:48:56
Join Taken Time                                   : 15 days 16 hours 15 minutes 0
seconds
Join Priority                                     : 1
Ethernet Port Duplex                              : Auto
Ethernet Port Speed                               : Auto
AP Link Latency                                   : Disabled
Rogue Detection                                   : Disabled
AP TCP MSS Adjust                                 : Disabled
AP TCP MSS Size                                   : 6146
```

show ap name config slot

To display the configuration of a Cisco AP and also display the common information for a slot, use the **show ap name config slot** command.

show ap name *Cisco-ap-name* **slot** *0-3*

Syntax Description

Cisco-ap-name	Specifies the name of the Cisco AP.
0-3	Specifies the slot ID.

Command Default   None

Command Modes   Any command mode

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

This example shows how to display common information for a slot in an access point:

```
Device# show ap name Cisco-ap-name config slot 3
```

show ap name config ethernet

To see Ethernet related configuration information of an AP, use the **show ap name** *ap-name* **config ethernet** command.

show ap name *ap-name* **config ethernet** [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description		
	ap-name	Name of the AP.
	chassis-number	Enter the chassis number as either 1 or 2.
	active R0	Active instance of the AP filters in Route-processor slot 0.
	standby R0	Standby instance of the AP filters in Route-processor slot 0.

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see Ethernet related configuration information of an AP:

```
Device# show ap name my-ap config ethernet
```

show ap name dot11

To display 802.11a or 802.11b configuration information that corresponds to specific Cisco lightweight access points, use the **show ap name dot11** command.

show ap name *ap-name* **dot11** { **24ghz** | **5ghz** | **6ghz** } { **ccx** | **cdp** | **profile** | **service-policy output** | **tsm** { **all** *client-mac* } }

Syntax Description		
ap-name	Name of the Cisco lightweight access point.
24ghz	Displays the 2.4-GHz band.
5ghz	Displays the 5-GHz band.
6ghz	Displays the 6-GHz band.
ccx	Displays the Cisco Client eXtensions (CCX) radio management status information.
cdp	Displays Cisco Discovery Protocol (CDP) information.
profile	Displays configuration and statistics of 802.11 profiling.
service-policy output	Displays downstream service policy information.
tsm	Displays 802.11 traffic stream metrics statistics.
all	Displays the list of all access points to which the client has associations.
client-mac	MAC address of the client.
SI	Displays the SI configurations.
airtime-fairness	Displays the stats of 24Ghz or 5Ghz or 6-GHz airtime-fairness.
call-control	Displays the call control information.
radio-reset	Displays radio-reset.
slot	Displays slot information.
voice	Displays voice information.

Command Default   None

Command Modes   Any command mode

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
Cisco IOS XE Cupertino 17.7.1	This command was modified to include 6-GHz band.

This example shows how to display the service policy that is associated with the access point:

```
Device# show ap name test-ap dot11 24ghz service-policy output

Policy Name  : test-ap1
Policy State : Installed
```

This example shows how to display the CCX RRM 802.11 configuration for a specific access point:

```
Device# show ap name AP01 dot11 24ghz ccx
```

This example show how to display CDP information for a specific access point:

```
Device# show ap name AP01 dot11 24ghz cdp

AP Name               AP CDP State
--------------------- --------------
AP03                  Disabled
```

This example show how to display the configuration and statistics of 802.11b profiling for a specific access point:

```
Device# show ap name AP01 dot11 24ghz profile

 802.11b Cisco AP performance profile mode       : GLOBAL
 802.11b Cisco AP Interference threshold         : 10 %
 802.11b Cisco AP noise threshold                : -70 dBm
 802.11b Cisco AP RF utilization threshold       : 80 %
 802.11b Cisco AP throughput threshold           : 1000000 bps
 802.11b Cisco AP clients threshold              : 12 clients
```

This example show how to display downstream service policy information for a specific access point:

```
Device# show ap name AP01 dot11 24ghz service-policy output

Policy Name  : def-11gn
Policy State : Installed
```

This example show how to display the traffic stream configuration for all clients that correspond to a specific access point:

```
Device# show ap name AP01 dot11 24ghz tsm all
```

show ap name environment

To see the AP environment information of an AP, use the **show ap name** *ap-name* **environment** command.

show ap name *ap-name* **environment** [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	*ap-name*	Name of the AP.
	chassis-number	Enter the chassis number as either 1 or 2.
	active R0	Active instance of the AP filters in Route-processor slot 0.
	standby R0	Standby instance of the AP filters in Route-processor slot 0.

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the AP environment information of an AP:

```
Device# show ap name my-ap environment
```

show ap name gps location

To see the GPS location of the AP, use the **show ap name gps location** command.

show ap name *ap-name* **gps location** [{*chassis-number* | **active** | **standby**}**R0**

Syntax Description		
	ap-name	Name of the Access Point
	gps	See the GPS information of a Cisco AP
	location	Shows the Mesh linktest data
	chassis-number	Enter the chassis number as either 1 or 2.
	active R0	Active instance of the active AP filters in Route-processor slot 0.
	standby R0	Standby instance of the configuration in Route-processor slot 0.

Command Default	None
Command Modes	Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the GPS location of an AP:

```
Device# show ap name mesh-profile-name gps location
```

show ap name grpc detail

To display the detailed status of gRPC channel from AP to Cisco DNA, use the **show ap name grpc detail** command.

show ap name *ap-name* **grpc detail**

Syntax Description

ap-name	Specifies the name of the AP.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Usage Guidelines None

Example

The following example shows how to display the detailed status of gRPC channel from AP to Cisco DNA:

```
Device(config)# show ap name APXXXX.BXXX.FXXX grpc detail
```

show ap name hyperlocation

To view a summary or detailed information about the hyperlocation configuration for an access point (AP), use the **show ap name hyperlocation** command.

show ap name *ap-name* **hyperlocation ble-beacon**

Syntax Description		
	ap-name	Access point name.
	hyperlocation	Displays AP hyperlocation information.
	ble-beacon	Displays BLE beacon configuration of an AP.

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Denali 16.3.1	This command was introduced.

Example

This example shows how to view the BLE beacon configuration of an AP:

```
Device# show ap name test-ap hyperlocation ble-beacon

ID  Major  Minor  TX Power(dBm)
-----------------------------
0   0      0      0
1   0      0      0
2   0      0      0
3   0      0      0
```

show ap name mesh backhaul

To see mesh backhaul statistics of an AP, use the **show ap name** *ap-name* **mesh backhaul** command.

show ap name *ap-name* **mesh backhaul** [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	*chassis-number*	Enter the chassis number as either 1 or 2.
	active R0	Active instance of the AP filters in Route-processor slot 0.
	standby R0	Standby instance of the AP filters in Route-processor slot 0.

Command Default	None

Command Modes	Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see mesh backhaul statistics of an AP:

```
Device# show ap name mymeshap mesh backhaul
```

Show Commands

show ap name mesh bhrate

To see mesh bachkhaul data rate for an AP, use the **show ap name** *ap-name* **mesh bhrate** command.

show ap name *ap-name* **mesh bhrate** [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

ap-name	Name of the AP.
chassis-number	Enter the chassis number as either 1 or 2.
active R0	Active instance of the AP filters in Route-processor slot 0.
standby R0	Standby instance of the AP filters in Route-processor slot 0.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see mesh bachkhaul data rate for an AP:

```
Device# show ap name mymeshap mesh bhrate
```

show ap name mesh linktest

To see the mesh linktest data, use the **show ap name mesh linktest data** command.

show ap name *ap-name* **mesh linktest data** *dest-mac* [**chassis** {*chassis-number* | **active** | **standby**}**R0**]

Syntax Description		
	ap-name	Name of the Access Point
	linktest	Shows the Mesh linktest
	data	Shows the Mesh linktest data
	dest-mac	Enter the AP MAC address.
	chassis-number	Enter the chassis number as either 1 or 2.
	active R0	Active instance of the configuration in Route-processor slot 0.
	standby R0	Standby instance of the configuration in Route-processor slot 0.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the mesh linktest data of an AP:

```
Device# show ap name mesh-profile-namemesh linktest data 83-88-15-0C-83-72
```

show ap name mesh neighbor detail

To see detailed information about a neighbor of a mesh AP, use the **show ap name** *ap-name* **mesh neighbor detail** command.

show ap name *ap-name* **mesh neighbor detail** [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	*ap-name*	Name of the AP.
	chassis-number	Enter the chassis number as either 1 or 2.
	active R0	Active instance of the AP filters in Route-processor slot 0.
	standby R0	Standby instance of the AP filters in Route-processor slot 0.

Command Default	None

Command Modes	Privileged EXEC

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see detailed information about a neighbor of a mesh AP:

```
Device# show ap name mymeshap mesh neighbhor detail
```

show ap name mesh neighbor detail

To see detailed information about a neighbor of a mesh AP, use the **show ap name** *ap-name* **mesh neighbor detail** command.

show ap name *ap-name* **mesh neighbor detail** [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	*ap-name*	Name of the AP.
	chassis-number	Enter the chassis number as either 1 or 2.
	active R0	Active instance of the AP filters in Route-processor slot 0.
	standby R0	Standby instance of the AP filters in Route-processor slot 0.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see detailed information about a neighbor of a mesh AP:

```
Device# show ap name mymeshap mesh neighbhor detail
```

show ap name mesh path

To see information about the mesh AP's path, use the **show ap name** *ap-name* **mesh path** command.

show ap name *ap-name* **mesh path** [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	*chassis-number*	Enter the chassis number as either 1 or 2.
	active R0	Active instance of the AP filters in Route-processor slot 0.
	standby R0	Standby instance of the AP filters in Route-processor slot 0.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see information about the mesh AP's path:

```
Device# show ap name mymeshap mesh path
```

show ap name mesh stats

To see mesh statistics, use the **show ap name** *ap-name* **mesh stats** command.

show ap name *ap-name*[**packet error** | **queue** | **security**]

Syntax Description		
	ap-name	Name of the AP.
	packet error	Mesh packet error statistics.
	queue	Mesh queue statistics.
	security	Mesh security statistics.
	chassis-number	Enter the chassis number as either 1 or 2.
	active R0	Active instance of the AP filters in Route-processor slot 0.
	standby R0	Standby instance of the AP filters in Route-processor slot 0.

Command Default	None

Command Modes	Privileged EXEC

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see mesh statistics:

```
Device# show ap name mymeshap mesh stats
```

show ap name tunnel eogre events

To display the Ethernet over GRE (EoGRE) events on an AP, use the **show ap name tunnel eogre events** command.

show ap name *ap-name* **tunnel eogre events**

Syntax Description	*ap-name*	AP name.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to display the EoGRE tunnel events on an AP:

```
Device# show ap name ap1 tunnel eogre events

AP 80e8.6fd4.9520  Event history
Timestamp              #Times   Event              RC Context
---------------------- -------- ------------------ --
--------------------------------------
02/18/2019 23:50:26.341 6       IAPP_STATS          0 GW Tunnel2 uptime:0s

02/18/2019 23:49:40.222 2       CLIENT_JOIN        0 74da.3828.88b0, (eogre_domain/2121)

02/18/2019 23:48:43.549 1       CLIENT_LEAVE       0 74da.3828.88b0, (eogre_domain/2121)

02/18/2019 23:47:33.127 1       DOMAIN_STATUS       0 eogre_domain Active GW: Tunnel1

02/18/2019 23:47:33.124 4       AP_TUNNEL_STATUS    0 Tunnel2 Dn

02/18/2019 23:47:33.124 1       MSG_CLIENT_DEL     0 GW Tunnel2 (IP: 9.51.1.12)

02/18/2019 23:47:33.124 2       TUNNEL_ADD         0 GW Tunnel2

02/18/2019 23:47:33.120 3       MSG_CLIENT_DEL_PD  0 GW Tunnel1 (IP: 9.51.1.11)

02/18/2019 23:47:31.763 2       AP_DOMAIN_PUSH     0 Delete:eogre_domain_set, 0 GWs

02/18/2019 23:47:31.753 4       AP_VAP_PUSH        0 profile:'eogre_tunnel',
wlan:pyats_eogre
```

show ap name tunnel eogre domain detailed

To display the detailed information of the Ethernet over GRE (EoGRE) tunnel domain status on an AP, use the **show ap name tunnel eogre domain detailed** command.

show ap name *ap-name* **tunnel eogre domain detailed** *domain-name*

Syntax Description		
	ap-name	AP name.
	domain-name	EoGRE domain name.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to display the detailed information of the EoGRE tunnel domain status on an AP:

```
Device# show ap name ap1 tunnel eogre domain detailed eogre_domain


Domain Name    : eogre_domain
 Primary GW    : Tunnel1
 Secondary GW  : Tunnel2
 Active GW     : Tunnel1
 Redundancy    : Non-Revertive
 AdminState    : Up
```

show ap name tunnel eogre domain summary

To display the summary information of the Ethernet over GRE (EoGRE) tunnel domain on an AP, use the **show ap name tunnel eogre domain summary** command.

show ap name *ap-name* **tunnel eogre domain summary**

Syntax Description	*ap-name*	AP name.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to display the summary information of the EoGRE tunnel domain on an AP:

```
Device# show ap name ap1 tunnel eogre domain summary

AP MAC          Domain                         Active Gateway
--------------------------------------------------------------------------------
80e8.6fd4.9520  eogre_domain
```

show ap name tunnel eogre gateway detailed

To display the detailed information of the Ethernet over GRE (EoGRE) tunnel gateway status on an AP, use the **show ap name tunnel eogre gateway detailed** command.

show ap name *ap-name* **tunnel eogre gateway detailed** *gateway-name*

Syntax Description	*ap-name*	AP name.
	gateway-name	EoGRE gateway name.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to display the detailed information of the EoGRE tunnel gateway status on an AP:

```
Device# show ap name ap1 tunnel eogre gateway detailed Tunnel2

Gateway : Tunnel2
 Mode   : IPv4
 IP     : 9.51.1.12
 State  : Down
 MTU    : 0
 AP MAC : 80e8.6fd4.9520

 Clients
  Total Number of Wireless Clients     : 0
 Traffic
  Total Number of Received Packets     : 0
  Total Number of Received Bytes       : 0
  Total Number of Transmitted Packets  : 0
  Total Number of Transmitted Bytes    : 0
  Total Number of Lost Keepalive       : 151
```

show ap name tunnel eogre gateway summary

To display the summary information of the Ethernet over GRE (EoGRE) tunnel gateway on an AP, use the **show ap name tunnel eogre gateway summary** command.

show ap name *ap-name* **tunnel eogre gateway summary**

Syntax Description	*ap-name*	AP name.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to display the summary information of the EoGRE tunnel gateway on an AP:

```
Device# show ap name ap1 tunnel eogre gateway summary

AP MAC          Gateway         Type  IP                                      State  Clients
-------------------------------------------------------------------------------------------
80e8.6fd4.9520  Tunnel1         IPv4  9.51.1.11                               Up     1

80e8.6fd4.9520  Tunnel2         IPv4  9.51.1.12                               Down   0
```

show ap name wlan

To display the Basic Service Set Identifier (BSSID) value for each WLAN defined on an access point and to display WLAN statistics, use the **show ap name wlan** command.

show ap name *ap-name* **wlan** {**dot11** {**24ghz** | **5ghz**} | **statistic**}

Syntax Description

ap-name	Name of the Cisco lightweight access point.
dot11	Displays 802.11 parameters.
24ghz	Displays 802.11b network settings.
5ghz	Displays 802.11a network settings.
statistic	Displays WLAN statistics.

Command Default   None

Command Modes   Any command mode

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to display BSSID information of an access point in an 802.11b network:

```
Device# show ap name AP01 wlan dot11 24ghz

Site Name                                        : default-group
Site Description                                 :

WLAN ID  Interface  BSSID
-----------------------------------
1        default    00:00:20:00:02:00
12       default    00:00:20:00:02:0b
```

This example shows how to display WLAN statistics for an access point:

```
Device# show ap name AP01 wlan statistic

WLAN ID  : 1
WLAN Profile Name  : maria-open

   EAP Id Request Msg Timeouts            : 0
   EAP Id Request Msg Timeouts Failures   : 0
   EAP Request Msg Timeouts               : 0
   EAP Request Msg Timeouts Failures      : 0
   EAP Key Msg Timeouts                   : 0
   EAP Key Msg Timeouts Failures          : 0


WLAN ID  : 12
WLAN Profile Name  : 24
```

```
EAP Id Request Msg Timeouts          : 0
EAP Id Request Msg Timeouts Failures : 0
EAP Request Msg Timeouts             : 0
EAP Request Msg Timeouts Failures    : 0
EAP Key Msg Timeouts                 : 0
EAP Key Msg Timeouts Failures        : 0
```

show ap name wlan vlan

To display the operational WLAN-VLAN mappings for each access point (AP), use the **show ap name wlan vlan** command.

show ap name *ap_name* **wlan vlan**

Syntax Description	*ap_name* Name of the AP whose WLAN-VLAN mappings are to be displayed.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

The following example shows the operational wlan vlan mappings for an AP:

```
Device# show ap name test wlan vlan

Policy tag mapping
------------------
WLAN Profile Name Name Policy    VLAN   Flex Central Switching  IPv4 ACL   IPv6 ACL
--------------------------------------------------------------------------------------
jey_cwa           pp-local-1     46     Enabled                 jey_acl1   Not Configured
swaguest          pp-local-1     46     Enabled                 jey_acl1   Not Configured
```

show ap name ble detail

To view the CMX associated with an AP, use the **show ap name ble detail** command.

show ap name *ap-name* **ble detail**

Syntax Description

ap-name	Specifies the name of the AP.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Usage Guidelines

This example shows how to display the global values for BLE and BLE details for a specific AP:

```
Device# show ap name AP4001.7AB2.C39A ble detail
CMX IP: 9.9.71.100
----------------------
  BLE administrative status: Up
  BLE operational status: Up
  Scanning interval: 10

  AP Name                          Interface          Status
  --------------------------------------------------------------
  AP4001.7AB2.C39A                 Integrated         Open
```

show ap name temperature

To view the temperature information of an AP, use the **show ap name temperature** command.

show ap name *ap-name* **temperature**

Syntax Description

ap-name	AP name.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Examples   This example shows how to view the temperature information of an AP:

```
Device# show ap name ap-3702 temperature
```

show ap management-mode meraki capability summary

To display the Meraki management mode capable AP information summary, use the **show ap management-mode meraki capability summary**

show ap management-mode meraki capability summary

Syntax Description	This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was modified.

Example

This example show how to display the Meraki management mode capable AP information summary:

```
Device# show ap management-mode meraki capability summary
```

show ap management-mode meraki change summary

To display the summary of the AP management mode meraki changes, use the **show ap management-mode meraki change summary** command.

show ap management-mode meraki change summary

Syntax Description	This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was modified.

Example

This example shows how to display the summary of the AP management mode meraki changes:

```
Device# show ap management-mode meraki change summary
```

show ap management-mode meraki failure summary

To display the Meraki management mode failure summary, use the **show ap management-mode meraki failure summary** command.

show ap management-mode meraki failure summary

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was modified.

Example

This example shows how to display the Meraki management mode failure summary:

```
Device# show ap management-mode meraki failure summary
```

show ap profile

To see overall status of Hyperlocation for an AP profile, use the **show ap profile** command.

show ap profile *profile-name* {**detailed** | **hyperlocation** {**ble-beacon** | **detail** | **summary**}} [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description		
	profile-name	AP profile name.
	detailed	Shows the detailed parameters of the AP join profile.
	hyperlocation	Shows Hyperlocation information for the AP profile.
	ble-beacon	Show the list of configured BLE beacons for the AP profile.
	detail	Shows detailed status of Hyperlocation for the AP profile.
	summary	Shows overall status of Hyperlocation for the AP profile
	chassis-number	Chassis number as either 1 or 2.
	active R0	Active instance in Route-processor slot 0.
	standby R0	Standby instance in Route-processor slot 0.

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the overall status of Hyperlocation for an AP profile:

```
Device# show ap profile my-ap-profile detailed
```

show ap rf-profile name

To display the selected ap RF-Profile details, use the **show ap rf-profile name** command.

show ap rf-profile name *profile-name* **detail**

Syntax Description	*profile-name*	Name of the RF-Profile.
	detail	Show detail of selected RF Profile.

Command Default None

Command Modes Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE Denali 16.3.1	This command was introduced.

Usage Guidelines None

This example shows how to display the details of the selected RF-Profile.

```
Device#show ap rf-profile name doctest detail
Description :
AP Group Names :
RF Profile Name : doctest
Band : 2.4 GHz
802.11n client only : Disabled
Transmit Power Threshold v1: -70 dBm
Min Transmit Power: -10 dBm
Max Transmit Power: 30 dBm
Operational Rates
  802.11b 1M Rate : Mandatory
  802.11b 2M Rate : Mandatory
  802.11b 5.5M Rate : Mandatory
  802.11b 11M Rate : Mandatory
  802.11b 6M Rate : Mandatory
  802.11b 9M Rate : Supported
  802.11b 12M Rate : Supported
  802.11b 18M Rate : Supported
  802.11b 24M Rate : Supported
  802.11b 36M Rate : Supported
  802.11b 48M Rate : Supported
  802.11b 54M Rate : Supported
Max Clients : 200
Wlan name                      Max Clients
-----------------------------------------

Trap Threshold
  Clients:  12 clients
  Interference:  10%
  Noise:  -70 dBm
  Utilization:  80%
Multicast Data Rate: auto
Rx SOP Threshold : auto
Band Select
```

```
             Probe Response:  Disabled
             Cycle Count:  2 cycles
             Cycle Threshold:  200 milliseconds
             Expire Suppression:  20 seconds
             Expire Dual Band:  60 seconds
             Client RSSI:  -80 dBm
             Client Mid RSSI:  -80 dBm
         Load Balancing
             Window:  5 clients
             Denial:  3 count
         Coverage Data
             Data: -80 dBm
             Voice: -80 dBm
            Minimum Client Level: 3 clients
             Exception Level: 25%
         DCA Channel List  : 1,5,9,13
         DCA Foreign AP Contribution : Enabled
         802.11n MCS Rates
             MCS 0 : Enabled
             MCS 1 : Enabled
             MCS 2 : Enabled
             MCS 3 : Enabled
             MCS 4 : Enabled
             MCS 5 : Enabled
             MCS 6 : Enabled
             MCS 7 : Enabled
             MCS 8 : Enabled
             MCS 9 : Enabled
             MCS 10 : Enabled
             MCS 11 : Enabled
             MCS 12 : Enabled
             MCS 13 : Enabled
             MCS 14 : Enabled
             MCS 15 : Enabled
             MCS 16 : Enabled
             MCS 17 : Enabled
             MCS 18 : Enabled
             MCS 19 : Enabled
             MCS 20 : Enabled
             MCS 21 : Enabled
             MCS 22 : Enabled
             MCS 23 : Enabled
             MCS 24 : Enabled
             MCS 25 : Enabled
             MCS 26 : Enabled
             MCS 27 : Enabled
             MCS 28 : Enabled
             MCS 29 : Enabled
             MCS 30 : Enabled
             MCS 31 : Enabled
         State : Down
```

show ap rf-profile summary

To display the ap RF-Profile summary, use the **show ap rf-profile summary** command.

show ap rf-profile summary

Syntax Description	**summary**	Show summary of RF Profiles

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Denali 16.3.1	This command was introduced.

Usage Guidelines

None

This example shows how to display the ap RF-Profile summary .

```
Device#show ap rf-profile summary
Number of RF Profiles : 1

RF Profile Name               Band    Description                          Applied   State
-------------------------------------------------------------------------------
doctest                       2.4 GHz                                      No        Down
```

show ap sensor status

To display the details of the AP sensors and their status, use the **show ap sensor status** command.

show ap sensor status

Syntax Description | This command has no arguments.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.8.1	This command was introduced.

Example

The following example displays the details of the AP sensors and their status:

```
Device# show ap sensor status
```

show ap summary

To display the status summary of all Cisco lightweight access points attached to the device, use the **show ap summary** command.

show ap summary

Syntax Description

This command has no keywords and arguments.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

Use this command to display a list that contains each lightweight access point name, number of slots, manufacturer, MAC address, location, and the device port number.

This example shows how to display a summary of all connected access points:

```
Controller# show ap summary

Number of APs: 1

Global AP User Name: Cisco
Global AP Dot1x User Name: Not configured

AP Name                         AP Model  Ethernet MAC    Radio MAC      State
--------------------------------------------------------------------------------
3602a                           3502I     003a.99eb.3fa8  d0c2.8267.8b00  Registered
```

show ap summary load-info

To view the AP per radio channel utilization and the total number of clients and slots per AP, use the **show ap summary load-info** command.

show ap summary load-info

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

This example shows how to view the AP per radio channel utilization and the total number of clients and slots per AP:

```
Device# show ap summary load-info

WTP-Mac          AP-Name           Tot-Slots Tot-Clients  Slot0                   Slot1
                 Slot2
                                                          Clients Utilisation(%) Clients
Utilisation(%)  Clients Utilisation(%)
--------------------------------------------------------------------------------------------------

04eb.409e.a5c0  AP04EB.409E.07EC 3         0            0       99             0       63
                0       0
1880.90fd.6b40  paxxxxi-AP       2         0            0       0              0       0
                NA      NA
```

show ap summary sort name

To view the access point (AP) summary sorted by name, use the **show ap summary sort name** command.

show ap summary sort name

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Examples   This example shows how to view the AP summary sorted by name:

```
Device# show ap summary sort name
Number of APs: 05
AP Name          Slots  AP Model          Ethernet MAC    Radio MAC        Location
Country  IP Address  State
-------------------------------------------------------------------------------------------------
ABC              2     AIR-AP1832I-D-K9   2c0b.e9b6.3618  2c0b.e9b7.3ec0   Real-AP-Testbed
IN     1.2.22.222  Registered
AP-Farm-1832I-4  2     AIR-AP1832I-D-K9   2c0b.e9b6.3e58  2c0b.e9b7.5fc0   Real-AP-Testbed
IN     1.2.22.22   Registered
AP-Farm-1832I-5  2     AIR-AP1832I-D-K9   2c0b.e9b6.3f60  2c0b.e9b7.63e0   Real-AP-Testbed
IN     1.2.22.22   Registered
AP-Farm-1832I-6  2     AIR-AP1832I-D-K9   2c0b.e9b6.3fe8  2c0b.e9b7.6600   Real-AP-Testbed
IN     1.2.22.22   Registered
AP-Farm-1832I-7  2     AIR-AP1832I-D-K9   2c0b.e9b6.4010  2c0b.e9b7.66a0   Real-AP-Testbed
IN     1.2.22.222
```

show ap summary sort ascending client-count

To view the AP summary sorted ascendingly based on the client count, use the **show ap summary sort ascending client-count** command.

show ap summary sort ascending client-count

Syntax Description	This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced.

This example shows how to view the AP summary sorted ascendingly based on the client count:

```
Device# show ap summary sort ascending client-count
-------------------------------------------------------------------------------------------------
AP-name                          AP-mac          Client count         Data Usage
   Through-Put     Admin-State
-------------------------------------------------------------------------------------------------
L2_3802I_1                       7872.5d27.b8c0       1                   622358
     11          Enabled
L2_1815w_1                       707d.b99e.c2e0       2                  5871836
     1422        Enabled
```

show ap summary sort ascending data-usage

To view the AP summary sorted ascendingly based on the data usage, use the **show ap summary sort ascending data-usage** command.

show ap summary sort ascending data-usage

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced.

This example shows how to view the AP summary sorted ascendingly based on the data usage:

```
Device# show ap summary sort ascending data-usage
--------------------------------------------------------------------------------------------------
AP-name                            AP-mac          Client count         Data Usage
    Through-Put       Admin-State
--------------------------------------------------------------------------------------------------
L2_3802I_1                         7872.5d27.b8c0       1                  622600
    4                 Enabled
L2_1815w_1                         707d.b99e.c2e0       2                  6102216
    281               Enabled
```

show ap summary sort ascending throughput

To view the AP summary sorted ascendingly based on the throughput, use the **show ap summary sort ascending throughput** command.

show ap summary sort ascending throughput

Syntax Description	This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced.

This example shows how to view the AP summary sorted ascendingly based on the throughput:

```
Device# show ap summary sort ascending throughput
-------------------------------------------------------------------------------------------------
AP-name                           AP-mac          Client count         Data Usage
   Through-Put      Admin-State
-------------------------------------------------------------------------------------------------
L2_3802I_1                        7872.5d27.b8c0      1                    6749385
     6            Enabled
L2_1815w_1                        707d.b99e.c2e0      2                    94748042
     35           Enabled
```

show ap summary sort descending client-count

To view the AP summary sorted descendingly based on the client count, use the **show ap summary sort descending client-count** command.

show ap summary sort descending client-count

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced.

This example shows how to view the AP summary sorted descendingly based on the client count:

```
Device# show ap summary sort descending client-count
---------------------------------------------------------------------------------------------------------
AP-name                           AP-mac          Client count         Data Usage
   Through-Put      Admin-State
---------------------------------------------------------------------------------------------------------
L2_1815w_1                        707d.b99e.c2e0     2                  94753989
      46            Enabled
L2_3802I_1                        7872.5d27.b8c0     1                  6750526
      6             Enabled
```

show ap summary sort descending data-usage

To view the AP summary sorted descendingly based on the data usage, use the **show ap summary sort descending data-usage** command.

show ap summary sort descending data-usage

Syntax Description	This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced.

This example shows how to view the AP summary sorted descendingly based on the data usage:

```
Device# show ap summary sort descending data-usage
----------------------------------------------------------------------------------------------
AP-name                        AP-mac          Client count        Data Usage
    Through-Put     Admin-State
----------------------------------------------------------------------------------------------
L2_1815w_1                     707d.b99e.c2e0    2                   94756618
    47              Enabled
L2_3802I_1                     7872.5d27.b8c0    0                   6750526
    6               Enabled
```

show ap summary sort descending throughput

To view the AP summary sorted descendingly based on the throughput, use the **show ap summary sort descending throughput** command.

show ap summary sort descending throughput

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced.

This example shows how to view the AP summary sorted descendingly based on the throughput:

```
Device# show ap summary sort descending throughput
_____
AP-name                          AP-mac          Client count        Data Usage
   Through-Put      Admin-State
_____
L2_1815w_1                       707d.b99e.c2e0    2                    94758750
     23            Enabled
L2_3802I_1                       7872.5d27.b8c0    0                     6750526
      6            Enabled
```

show ap support-bundle summary

To display the summary of the AP support-bundle, use the **show ap support-bundle summary** command.

show ap support-bundle summary

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privilege EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

This examples displays the summary of the AP support-bundle:

```
Device# show ap support-bundle summary
```

show ap tag sources

To see AP tag sources with priorities, use the **show ap tag sources** command.

show ap tag sources [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	*chassis-number*	Chassis number as either 1 or 2.
	active R0	Active instance of the AP filters in Route-processor slot 0.
	standby R0	Standby instance of the AP filters in Route-processor slot 0.

Command Default	None

Command Modes	Privileged EXEC

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the AP tag sources with priorities for the active instance:

```
Device# show ap tag sources chassis active R0
```

show ap tag summary

To view brief summary of tag names, use the **show ap tag summary** command.

show ap tag summary

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to view brief summary of tag names:

```
Device# show ap tag summary
```

show ap triradio summary

To view the tri-radio summary, and to verify if the slots are enabled and up, use the **show ap triradio summary** command.

show ap triradio summary

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privilege EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Example

This example displays the tri-radio summary, and to verify if the slots are enabled:

```
Device# show ap triradio summary
```

show ap timezone

To check the AP timezone information, use the **show ap timezone** command.

show ap timezone

Syntax Description   This command has no keywords and arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Examples   The following example shows how to check the AP timezone information:

```
Device# show ap timezone

AP Name    Status     Offsets(h/m)
------------------------------
AP1        Disabled   0:0
AP2        Enabled    1:0
```

show ap upgrade

To see AP upgrade information, use the **show ap upgrade** command.

show ap upgrade [**name** *ap-upgrade-report-name* | **summary** | **chassis** {*chassis-number* | **active** | **standby**}]

Syntax Description	**name** *ap-upgrade-report-name*	Enter the name of the AP upgrade report.
	summary	Shows a summary of AP upgrade information.
	chassis-number	Enter the chassis number as either 1 or 2.
	active R0	Active instance in Route-processor slot 0.
	standby R0	Standby instance in Route-processor slot 0.

Command Default	None

Command Modes	Privileged EXEC

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see a summary of the AP upgrade information:

```
Device# show ap upgrade summary
```

show ap upgrade method

To verify the status of the configuration of the image download over HTTPS method, use the **show ap upgrade method** command.

show ap upgrade method

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Dublin 17.11.1	This command was introduced.

Examples   The following example shows how to verify the status of HTTPS image download configuration:

```
Device# show ap upgrade method

AP upgrade method https : Enabled
```

show arp

To view the ARP table, use the **show arp** command.

show arp

Syntax Description

arp	Shows ARP table

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

The following example shows a sample output of the command:

```
Device# show arp

Address Age (min)    Hardware Addr
   9.11.8.1         0 84:80:2D:A0:D2:E6
9.11.32.111         0 3C:77:E6:02:33:3F
```

show arp summary

To see the ARP table summary, use the **show arp summary** command.

show arp summary

Command Default	None

Command Modes	Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the ARP table summary:

```
Device# show arp summary
```

show ap tunnel eogre events

To display the Ethernet over GRE (EoGRE) tunnel events, use the **show ap tunnel eogre events** command.

show ap tunnel eogre events

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to display the EoGRE tunnel events:

```
Device# show ap tunnel eogre events

AP 80e8.6fd4.9520  Event history
Timestamp              #Times   Event              RC Context
---------------------- -------- ------------------ --
----------------------------------------
02/18/2019 23:50:26.341 6       IAPP_STATS          0 GW Tunnel2 uptime:0s

02/18/2019 23:49:40.222 2       CLIENT_JOIN         0 74da.3828.88b0, (eogre_domain/2121)

02/18/2019 23:48:43.549 1       CLIENT_LEAVE        0 74da.3828.88b0, (eogre_domain/2121)

02/18/2019 23:47:33.127 1       DOMAIN_STATUS       0 eogre_domain Active GW: Tunnel1

02/18/2019 23:47:33.124 4       AP_TUNNEL_STATUS    0 Tunnel2 Dn

02/18/2019 23:47:33.124 1       MSG_CLIENT_DEL      0 GW Tunnel2 (IP: 9.51.1.12)

02/18/2019 23:47:33.124 2       TUNNEL_ADD          0 GW Tunnel2

02/18/2019 23:47:33.120 3       MSG_CLIENT_DEL_PD   0 GW Tunnel1 (IP: 9.51.1.11)

02/18/2019 23:47:31.763 2       AP_DOMAIN_PUSH      0 Delete:eogre_domain_set, 0 GWs

02/18/2019 23:47:31.753 4       AP_VAP_PUSH         0 profile:'eogre_tunnel',
wlan:pyats_eogre
```

show ap tunnel eogre domain detailed

To display the detailed information of the Ethernet over GRE (EoGRE) tunnel domain status on an AP, use the **show ap tunnel eogre domain detailed** command.

show ap tunnel eogre domain detailed *domain-name*

Syntax Description	*domain-name*	EoGRE domain name.

Command Default None

Command Modes Privileged EXEC (#)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to display the detailed information of the EoGRE tunnel domain status:

```
Device# show ap tunnel eogre domain detailed Tunnel1


Gateway : Tunnel1
 Mode   : IPv4
 IP     : 9.51.1.11
 State  : Up
 MTU    : 1476
 Up Time: 14 hours 25 minutes 2 seconds
 AP MAC : 80e8.6fd4.9520

 Clients
  Total Number of Wireless Clients      : 1
 Traffic
  Total Number of Received Packets      : 6
  Total Number of Received Bytes        : 2643
  Total Number of Transmitted Packets   : 94
  Total Number of Transmitted Bytes     : 20629
  Total Number of Lost Keepalive        : 3
```

show ap name tunnel eogre domain summary

To display the summary information of the Ethernet over GRE (EoGRE) tunnel domain on an AP, use the **show ap nametunnel eogre domain summary** command.

show ap name *ap-name* **tunnel eogre domain summary**

Syntax Description	*ap-name* AP name.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to display the summary information of the EoGRE tunnel domain on an AP:

```
Device# show ap name ap1 tunnel eogre domain summary

AP MAC          Domain                          Active Gateway
-------------------------------------------------------------------------------
80e8.6fd4.9520  eogre_domain                    Tunnel1
```

show ap tunnel eogre gateway detailed

To display the detailed information of the Ethernet over GRE (EoGRE) tunnel gateway status on an AP, use the **show ap name tunnel eogre gateway detailed** command.

show ap name *ap-name* **tunnel eogre gateway detailed** *gateway-name*

Syntax Description	*ap-name*	AP name.
	gateway-name	EoGRE domain name.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to display the detailed information of the EoGRE tunnel gateway status on an AP:

```
Device# show ap name ap1 tunnel eogre gateway detailed Tunnel1

Gateway : Tunnel1
 Mode   : IPv4
 IP     : 9.51.1.11
 State  : Up
 MTU    : 1476
 Up Time: 14 hours 25 minutes 2 seconds
 AP MAC : 80e8.6fd4.9520

 Clients
  Total Number of Wireless Clients      : 1
 Traffic
  Total Number of Received Packets      : 6
  Total Number of Received Bytes        : 2643
  Total Number of Transmitted Packets   : 94
  Total Number of Transmitted Bytes     : 20629
  Total Number of Lost Keepalive        : 3
```

show ap tunnel eogre gateway summary

To display the summary information of the Ethernet over GRE (EoGRE) tunnel gateway, use the **show ap tunnel eogre gateway summary** command.

show ap tunnel eogre gateway summary

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to display the summary information of the EoGRE tunnel gateway:

```
Device# show ap tunnel eogre gateway summary

AP MAC          Gateway         Type  IP                                              State  Clients
-------------------------------------------------------------------------------------------------
80e8.6fd4.9520  Tunnel1         IPv4  9.51.1.11                                       Up     1

80e8.6fd4.9520  Tunnel2         IPv4  9.51.1.12                                       Down   0
```

show ap upgrade site

To view the upgrade site-related infromation, use the **show ap upgrade site** command.

show ap upgrade site [**summary**]

Syntax Description

summary	(Optional) Displays a summary of access point (AP) upgrade on individual sites.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Examples   The following example shows how to view the upgrade site-related infromation:

```
Device# show ap upgrade site

Site-filtered AP upgrade report data
====================================
Source controller: Controller1
Destination controller: Controller2
Site-filters present: Yes

AP image upgrade site summary
---------------------------
Operation: N+1 move

Site Tag                                  Status
----------------------------------------------------------
site1                                     In Progress

AP upgrade reports linked to these site-filters
----------------------------------------------

Start time              Operation type         Report name
---------------------------------------------------------------------
01/30/2022 10:34:36 IST  AP image upgrade/move CLI  AP_upgrade_to_Controller2_3002022103435
```

show avc client

To display information about top number of applications, use the **show avc client** command in privileged EXEC mode.

show avc client *client-mac* **top** *n* **application** [**aggregate** | **upstream** | **downstream**]

Syntax Description	
client *client-mac*	Specifies the client MAC address.
top *n* **application**	Specifies the number of top "N" applications for the given client.

Command Default No default behavior or values.

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

The following is sample output from the **show avc client** command:

```
Device# sh avc client 0040.96ae.65ec top 10 application aggregate

Cumulative Stats:

No.   AppName      Packet-Count     Byte-Count      AvgPkt-Size      usage%
------------------------------------------------------------------------
1     skinny       7343             449860          61               94
2     unknown      99               13631           137              3
3     dhcp         18               8752            486              2
4     http         18               3264            181              1
5     tftp         9                534             59               0
6     dns          2                224             112              0

Last Interval(90 seconds) Stats:

No.   AppName      Packet-Count     Byte-Count      AvgPkt-Size      usage%
------------------------------------------------------------------------
1     skinny       9                540             60               100
```

show avc wlan

To display information about top applications and users using the applications, use the **show avc wlan** command in privileged EXEC mode.

show **avc** **wlan** *ssid* **top** *n* **application** [**aggregate** | **upstream** | **downstream**]

Syntax Description

wlan *ssid*	Specifies the Service Set IDentifier (SSID) for WLAN.
top *n* **application**	Specifies the number of top "N" applications.

Command Default

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

The following is sample output from the **show avc wlan** command:

```
Device# show avc wlan Lobby_WLAN top 10 application aggregate

Cumulative Stats:

No.  AppName          Packet-Count        Byte-Count          AvgPkt-Size  usage%
-----------------------------------------------------------------------------------
1    ssl              10598677            1979525706          997          42
2    vnc              5550900             3764612847          678          14
3    http             3043131             2691327197          884          10
4    unknown          1856297             1140264956          614          4
5    video-over-http  1625019             2063335150          1269         8
6    binary-over-http 1329115             1744190344          1312         6
7    webex-meeting    1146872             540713787           471          2
8    rtp              923900              635650544           688          2
9    unknown          752341              911000213           1210         3
10   youtube          631085              706636186           1119         3

Last Interval(90 seconds) Stats:

No.  AppName          Packet-Count        Byte-Count          AvgPkt-Size  usage%
-----------------------------------------------------------------------------------
1    vnc              687093              602731844           877          68
2    video-over-http  213272              279831588           1312         31
3    ssl              6515                5029365             771          1
4    webex-meeting    3649                1722663             472          0
5    http             2634                1334355             506          0
6    unknown          1436                99412               69           0
7    google-services  722                 378121              523          0
8    linkedin         655                 393263              600          0
9    exchange         432                 167390              387          0
10   gtalk-chat       330                 17330               52           0
```

show awips wlc-alarm

To view the contents of the AWIPS WLC Alarm table, use the **show awips wlc-alarm** command.

show awips wlc-alarm

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced

Examples   The following example shows how to view the contents of the AWIPS WLC Alarm table:

```
Device# show awips wlc-alarm

Time               BSSID           Client MAC      Alarm description
--------------------------------------------------------------
04/02/2020 16:03:18  e4aa.5d53.b921  74da.3864.2a94  WPA2 Key Reinstal KRACK
04/02/2020 16:03:19  e4aa.5d53.b921  74da.3864.2a94  WPA2 Key Reinstal KRACK
04/02/2020 16:03:20  e4aa.5d53.b921  74da.3864.2a94  WPA2 Key Reinstal KRACK
04/02/2020 16:03:21  e4aa.5d53.b921  74da.3864.2a94  WPA2 Key Reinstal KRACK
```

show awips syslog throttle

To verify the syslog configuration for Cisco Advanced Wireless Intrusion Prevention System (aWIPS), use the **show awips syslog throttle** command.

show awips syslog throttle

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

The following example shows how to verify the syslog configuration for aWIPS:

```
Device# show awips syslog throttle
Syslog Throttle Interval (seconds)
-----------------------------------------------------------
60
```

show capwap client rcb

To view the CAPWAP status and modes, use the **show capwap client rcb** command on the access point.

show capwap client rcb

Syntax Description
This command has no keywords and arguments.

Command Default
None

Command Modes
Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Example

This example shows how to view the CAPWAP status and modes on the access point:

```
AP# show capwap client rcb

OperationState                   : UP
Name                             : AP4001.7A39.2D5A
MwarHwVer                        : 0.0.0.0
Location                         : default location
ApMode                           : Remote Bridge
ApSubMode                        : Not Configured
CAPWAP Path MTU                  : 1485
Software Initiated Reload Reason : Reload command
CAPWAP Sliding Window
Active Window Size               : 10
Last Request Send To Application : 184
Expected Seq Num                 : 185
Received Seq Num                 : 184
Request Packet Count             : 42424
Out Of Range Packets Count       : 0
Window Moved  Packets Count      : 0
In Range Packets Count           : 960
Expected Packets Count           : 41464
```

show chassis

To see the chassis information, use the **show chassis** command.

show chassis [*1 2* | **detail** | **mode** | **neighbors** | **ha-status** {**active** | **local** | **standby**}]

Syntax Description		
	*{1	2}*	Chassis number as 1 or 2 to see the information about the relevant chassis.
	detail	Shows detailed information about the chassis.
	mode	Shows information about the chassis mode.
	neighbors	Shows information about the chassis neighbors.
	ha-status	Option to see information about the High Availability (HA) status.
	active	Shows HA status on the chassis that is in active state.
	local	Shows HA status on the local chassis.
	standby	Shows HA status on the chassis that is in standby state.

Command Default　None

Command Modes　Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the HA status on the active chassis:

```
Device# show chassis ha-status active
```

show chassis rmi

To verify the chassis Redundancy Management Interface (RMI) configuration for an active controller, use the **show chassis rmi** command.

show chassis rmi

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1	This command was introduced.

This example shows how to verify the chassis Redundancy Management Interface (RMI) configuration for an active controller:

```
Device# show chassis rmi
Chassis/Stack Mac Address : 000c.2964.1eb6 - Local Mac Address
Mac persistency wait time: Indefinite
                                            H/W  Current
Chassis# Role Mac Address Priority Version State IP RMI-IP
-------------------------------------------------------------------------------------------------
*1 Active 000c.2964.1eb6 1 V02 Ready 169.254.90.147 9.10.90.147
2 Standby 000c.2975.3aa6 1 V02 Ready 169.254.90.149 9.10.90.149
```

show checkpoint

To display information about the Checkpoint Facility (CF) subsystem, use the **show checkpoint** command.

show checkpoint { **clients** *client-ID <0-381>* | **entities***entity-ID <1-7>* | **statisticsbuffer-usage** }

Syntax Description		
clients	Displays detailed information about checkpoint clients.	
entities	Displays detailed information about checkpoint entities.	
statistics	Displays detailed information about checkpoint statistics.	
buffer-usage	Displays the checkpoint statistics of clients using large number of buffers.	

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to display all the CF clients.

```
   Client residing in process  : 8135
--------------------------------------------------------------------------------
Checkpoint client: WCM_MOBILITY
    Client ID                 : 24105
    Total DB inserts          : 0
    Total DB updates          : 0
    Total DB deletes          : 0
    Total DB reads            : 0
    Number of tables          : 6
    Client residing in process  : 8135
--------------------------------------------------------------------------------
Checkpoint client: WCM_DOT1X
    Client ID                 : 24106
    Total DB inserts          : 2
    Total DB updates          : 1312
    Total DB deletes          : 2
    Total DB reads            : 0
    Number of tables          : 1
    Client residing in process  : 8135
--------------------------------------------------------------------------------
Checkpoint client: WCM_APFROGUE
    Client ID                 : 24107
    Total DB inserts          : 0
    Total DB updates          : 0
    Total DB deletes          : 0
    Total DB reads            : 0
    Number of tables          : 1
    Client residing in process  : 8135
--------------------------------------------------------------------------------
Checkpoint client: WCM_CIDS
    Client ID                 : 24110
    Total DB inserts          : 0
```

```
        Total DB updates         : 0
        Total DB deletes         : 0
        Total DB reads           : 0
        Number of tables         : 0
        Client residing in process : 8135
--------------------------------------------------------------------------------
Checkpoint client: WCM_NETFLOW
        Client ID                : 24111
        Total DB inserts         : 7
        Total DB updates         : 0
        Total DB deletes         : 0
        Total DB reads           : 0
        Number of tables         : 1
        Client residing in process : 8135
--------------------------------------------------------------------------------
Checkpoint client: WCM_MCAST
        Client ID                : 24112
        Total DB inserts         : 0
        Total DB updates         : 0
        Total DB deletes         : 0
        Total DB reads           : 0
        Number of tables         : 1
        Client residing in process : 8135
--------------------------------------------------------------------------------
Checkpoint client: wcm_comet
        Client ID                : 24150
        Total DB inserts         : 0
        Total DB updates         : 0
        Total DB deletes         : 0
        Total DB reads           : 0
        Number of tables         : 0
        Client residing in process : 8135
--------------------------------------------------------------------------------


All iosd checkpoint clients


--------------------------------------------------------------------------------
Client Name             Client      Entity    Bundle
                        ID          ID        Mode
--------------------------------------------------------------------------------
Network RF Client          3          --       Off

  Total API Messages Sent:                    0
  Total Transport Messages Sent:              0
  Length of Sent Messages:                    0
  Total Blocked Messages Sent:                0
  Length of Sent Blocked Messages:            0
  Total Non-blocked Messages Sent:            0
  Length of Sent Non-blocked Messages:        0
  Total Bytes Allocated:                      0
  Buffers Held:                               0
  Buffers Held Peak:                          0
  Huge Buffers Requested:                     0
  Transport Frag Count:                       0
  Transport Frag Peak:                        0
  Transport Sends w/Flow Off:                 0
  Send Errs:                                  0
  Send Peer Errs:                             0
  Rcv Xform Errs:                             0
  Xmit Xform Errs:                            0
  Incompatible Messages:                      0
  Client Unbundles to Process Memory:         T
--------------------------------------------------------------------------------
Client Name             Client      Entity    Bundle
```

```
                              ID        ID      Mode
--------------------------------------------------------------------------------
SNMP CF Client                12        --      Off

  Total API Messages Sent:                      0
  Total Transport Messages Sent:                0
  Length of Sent Messages:                      0
  Total Blocked Messages Sent:                  0
  Length of Sent Blocked Messages:              0
  Total Non-blocked Messages Sent:              0
  Length of Sent Non-blocked Messages:          0
  Total Bytes Allocated:                        0
  Buffers Held:                                 0
  Buffers Held Peak:                            0
  Huge Buffers Requested:                       0
  Transport Frag Count:                         0
  Transport Frag Peak:                          0
  Transport Sends w/Flow Off:                   0
  Send Errs:                                    0
  Send Peer Errs:                               0
  Rcv Xform Errs:                               0
  Xmit Xform Errs:                              0
  Incompatible Messages:                        0
  Client Unbundles to Process Memory:           T
--------------------------------------------------------------------------------
Client Name             Client    Entity  Bundle
                        ID        ID      Mode
--------------------------------------------------------------------------------
Online Diags HA         14        --      Off

  Total API Messages Sent:                      0
  Total Transport Messages Sent:                0
  Length of Sent Messages:                      0
  Total Blocked Messages Sent:                  0
  Length of Sent Blocked Messages:              0
  Total Non-blocked Messages Sent:              0
  Length of Sent Non-blocked Messages:          0
  Total Bytes Allocated:                        0
  Buffers Held:                                 0
  Buffers Held Peak:                            0
  Huge Buffers Requested:                       0
  Transport Frag Count:                         0
  Transport Frag Peak:                          0
  Transport Sends w/Flow Off:                   0
  Send Errs:                                    0
  Send Peer Errs:                               0
  Rcv Xform Errs:                               0
  Xmit Xform Errs:                              0
  Incompatible Messages:                        0
  Client Unbundles to Process Memory:           T
--------------------------------------------------------------------------------
Client Name             Client    Entity  Bundle
                        ID        ID      Mode
--------------------------------------------------------------------------------
ARP                     22        --      Off

  Total API Messages Sent:                      0
  Total Transport Messages Sent:                0
  Length of Sent Messages:                      0
  Total Blocked Messages Sent:                  0
  Length of Sent Blocked Messages:              0
  Total Non-blocked Messages Sent:              0
  Length of Sent Non-blocked Messages:          0
  Total Bytes Allocated:                        0
```

```
  Buffers Held:                            0
  Buffers Held Peak:                       0
  Huge Buffers Requested:                  0
  Transport Frag Count:                    0
  Transport Frag Peak:                     0
  Transport Sends w/Flow Off:              0
  Send Errs:                               0
  Send Peer Errs:                          0
  Rcv Xform Errs:                          0
  Xmit Xform Errs:                         0
  Incompatible Messages:                   0
  Client Unbundles to Process Memory:      T
-------------------------------------------------------------------------------
Client Name              Client    Entity    Bundle
                           ID        ID       Mode
-------------------------------------------------------------------------------
Tableid CF                 27        --       Off

  Total API Messages Sent:                 0
  Total Transport Messages Sent:           0
  Length of Sent Messages:                 0
  Total Blocked Messages Sent:             0
  Length of Sent Blocked Messages:         0
  Total Non-blocked Messages Sent:         0
  Length of Sent Non-blocked Messages:     0
  Total Bytes Allocated:                   0
  Buffers Held:                            0
  Buffers Held Peak:                       0
  Huge Buffers Requested:                  0
  Transport Frag Count:                    0
  Transport Frag Peak:                     0
  Transport Sends w/Flow Off:              0
  Send Errs:                               0
  Send Peer Errs:                          0
  Rcv Xform Errs:                          0
  Xmit Xform Errs:                         0
  Incompatible Messages:                   0
  Client Unbundles to Process Memory:      T
-------------------------------------------------------------------------------
Client Name              Client    Entity    Bundle
                           ID        ID       Mode
-------------------------------------------------------------------------------
Event Manager              33        0        Off

  Total API Messages Sent:                 0
  Total Transport Messages Sent:           --
  Length of Sent Messages:                 0
  Total Blocked Messages Sent:             0
  Length of Sent Blocked Messages:         0
  Total Non-blocked Messages Sent:         0
  Length of Sent Non-blocked Messages:     0
  Total Bytes Allocated:                   0
  Buffers Held:                            0
  Buffers Held Peak:                       0
  Huge Buffers Requested:                  0
  Transport Frag Count:                    0
  Transport Frag Peak:                     0
  Transport Sends w/Flow Off:              0
  Send Errs:                               0
  Send Peer Errs:                          0
  Rcv Xform Errs:                          0
  Xmit Xform Errs:                         0
  Incompatible Messages:                   0
  Client Unbundles to Process Memory:      T
```

```
--------------------------------------------------------------------------------
Client Name             Client    Entity    Bundle
                        ID        ID        Mode
--------------------------------------------------------------------------------
LAN-Switch Port Mana     35        0        Off

  Total API Messages Sent:                    0
  Total Transport Messages Sent:              --
  Length of Sent Messages:                    0
  Total Blocked Messages Sent:                0
  Length of Sent Blocked Messages:            0
  Total Non-blocked Messages Sent:            0
  Length of Sent Non-blocked Messages:        0
  Total Bytes Allocated:                      0
  Buffers Held:                               0
  Buffers Held Peak:                          0
  Huge Buffers Requested:                     0
  Transport Frag Count:                       0
  Transport Frag Peak:                        0
  Transport Sends w/Flow Off:                 0
  Send Errs:                                  0
  Send Peer Errs:                             0
  Rcv Xform Errs:                             0
  Xmit Xform Errs:                            0
  Incompatible Messages:                      0
  Client Unbundles to Process Memory:         T
--------------------------------------------------------------------------------
Client Name             Client    Entity    Bundle
                        ID        ID        Mode
--------------------------------------------------------------------------------
LAN-Switch PAgP/LACP     36        0        Off

  Total API Messages Sent:                    0
  Total Transport Messages Sent:              --
  Length of Sent Messages:                    0
  Total Blocked Messages Sent:                0
  Length of Sent Blocked Messages:            0
  Total Non-blocked Messages Sent:            0
  Length of Sent Non-blocked Messages:        0
  Total Bytes Allocated:                      0
  Buffers Held:                               0
  Buffers Held Peak:                          0
  Huge Buffers Requested:                     0
  Transport Frag Count:                       0
  Transport Frag Peak:                        0
  Transport Sends w/Flow Off:                 0
  Send Errs:                                  0
  Send Peer Errs:                             0
  Rcv Xform Errs:                             0
  Xmit Xform Errs:                            0
  Incompatible Messages:                      0
  Client Unbundles to Process Memory:         T
--------------------------------------------------------------------------------
Client Name             Client    Entity    Bundle
                        ID        ID        Mode
--------------------------------------------------------------------------------
LAN-Switch VLANs         39        0        Off

  Total API Messages Sent:                    0
  Total Transport Messages Sent:              --
  Length of Sent Messages:                    0
  Total Blocked Messages Sent:                0
  Length of Sent Blocked Messages:            0
  Total Non-blocked Messages Sent:            0
```

```
Length of Sent Non-blocked Messages:        0
Total Bytes Allocated:                      0
Buffers Held:                               0
Buffers Held Peak:                          0
Huge Buffers Requested:                     0
Transport Frag Count:                       0
Transport Frag Peak:                        0
Transport Sends w/Flow Off:                 0
Send Errs:                                  0
Send Peer Errs:                             0
Rcv Xform Errs:                             0
```

This example shows how to display all the CF entities.

```
KATANA_DOC#show checkpoint entities
                      Check Point List of Entities

 CHKPT on ACTIVE server.


--------------------------------------------------------------------------------
Entity ID         Entity Name
--------------------------------------------------------------------------------
        0         CHKPT_DEFAULT_ENTITY

  Total API Messages Sent:          0
  Total Messages Sent:              0
  Total Sent Message Len:           0
  Total Bytes Allocated:            0
  Total Number of Members:          10

  Member(s) of entity 0 are:
    Client ID         Client Name
----------------------------------------
        168           DHCP Snooping
        167           IGMP Snooping
         41           Spanning-tree
         40           AUTH MGR CHKPT CLIEN
         39           LAN-Switch VLANs
         33           Event Manager
         35           LAN-Switch Port Mana
         36           LAN-Switch PAgP/LACP
        158           Inline Power Checkpoint
```

This example shows how to display the CF statistics.

```
KATANA_DOC#show checkpoint statistics
        IOSd Check Point Status
 CHKPT on ACTIVE server.

Number Of Msgs In Hold Q:             0
CHKPT MAX Message Size:               0
TP MAX Message Size:              65503
CHKPT Pending Msg Timer:           100 ms

  FLOW_ON  total:                     0
  FLOW_OFF total:                     0
  Current FLOW status is:            ON
  Total API Messages Sent:            0
  Total Messages Sent:                0
  Total Sent Message Len:             0
  Total Bytes Allocated:              0
  Rcv  Msg Q Peak:                    0
  Hold Msg Q Peak:                    0
```

```
Buffers Held Peak:                      0
Current Buffers Held:                   0
Huge Buffers Requested:                 0
```

show cts environment data

To display the TrustSec environment data on the AP, use the **show cts environment data** command:

show cts environment data

Syntax Description	This command has no arguments or keywords.

Command Default	None

Command Modes	Privileged EXEC (#)

Command History

Release	Modification
Cisco Amsterdam 17.1.1	This command was introduced.

Examples

The following example shows the TrustSec environment data on the AP:

```
Device# show cts environment

CTS Environment Data
====================
Current state = COMPLETE
Last status   = Successful
Local Device SGT:
SGT tag = 0-07:Unknown
Server List Info:
Installed list: CTSServerList1-0001, 1 server(s):
Server: 8.109.0.85, port 1812, A-ID 9818EE1ECA02B7BFE359C28B30EA7E2A
Status = ALIVE
auto-test = FALSE, keywrap-enable = FALSE, idle-time = 60 mins, deadtime = 20 secs
Security Group Name Table:
0-07:Unknown
2-00:TrustSec_Devices
3-00:Network_Services
4-00:Employees
5-00:Contractors
6-00:Guests
7-00:Production_Users
8-00:Developers
9-00:Auditors
10-00:Point_of_Sale_Systems
11-02:Production_Servers
12-00:Development_Servers
13-00:Test_Servers
14-00:PCI_Servers
15-00:BYOD
16-06:BGL15
17-00:BGL12
255-00:Quarantined_Systems
Environment Data Lifetime = 86400 secs
Last update time = 11:50:49 UTC Sun Jan 9 2022
Env-data expires in   0:00:28:54 (dd:hr:mm:sec)
Env-data refreshes in 0:00:28:54 (dd:hr:mm:sec)
```

```
Cache data applied = NONE
State Machine is running
```

show cts role-based sgt-map all

To display the bindings of IP address and SGT source names on the AP, use the **show cts role-based sgt-map all** command:

show cts role-based sgt-map all

Syntax Description	This command has no arguments or keywords.

Command Default	None

Command Modes	Privileged EXEC (#)

Command History

Release	Modification
Cisco Amsterdam 17.1.1	This command was introduced.

Examples

The following example shows the bindings of IP address and SGT source names on the AP:

```
Device# show cts role-based stg-map all

Active IPv4-SGT Bindings Information
IP Address                              SGT       Source
======================================================================
8.73.1.101                              16        LOCAL
8.73.1.102                              16        LOCAL
8.73.1.103                              16        LOCAL
8.73.1.104                              16        LOCAL
8.73.1.105                              16        LOCAL
8.73.1.106                              16        LOCAL
8.73.1.107                              16        LOCAL
8.73.1.108                              16        LOCAL
8.73.1.109                              16        LOCAL
8.73.1.110                              16        LOCAL
8.73.1.111                              16        LOCAL
8.73.1.112                              16        LOCAL
8.73.1.113                              16        LOCAL
8.73.1.114                              16        LOCAL
8.73.1.115                              16        LOCAL
8.73.1.116                              16        LOCAL
8.73.1.117                              16        LOCAL
8.73.1.118                              16        LOCAL
8.73.1.119                              16        LOCAL
8.73.1.120                              16        LOCAL
8.73.1.121                              16        LOCAL
8.73.1.122                              16        LOCAL
8.73.1.123                              16        LOCAL
8.73.1.124                              16        LOCAL
8.73.1.125                              16        LOCAL
8.73.1.126                              16        LOCAL
8.73.1.127                              16        LOCAL
8.73.1.128                              16        LOCAL
8.73.1.129                              16        LOCAL
8.73.1.130                              16        LOCAL
8.73.1.131                              16        LOCAL
```

```
8.73.1.132                                  16     LOCAL
8.73.1.133                                  16     LOCAL
8.73.1.134                                  16     LOCAL
8.73.1.135                                  16     LOCAL
8.73.1.136                                  16     LOCAL
8.73.1.137                                  16     LOCAL
8.73.1.138                                  16     LOCAL
8.73.1.139                                  16     LOCAL
8.73.1.140                                  16     LOCAL
8.73.1.141                                  16     LOCAL
8.73.1.142                                  16     LOCAL
FD09:8::                                    16     LOCAL
FD09:8:73:0:4051:EB27:B4A2:F6DB             16     LOCAL
FD09:8:73:0:4C3C:1D75:81E0:DB94             16     LOCAL
FD09:8:73:0:5136:9045:9D11:E191             16     LOCAL
FD09:8:73:0:6903:B84E:5BDF:9D54             16     LOCAL
FD09:8:73:0:A9F8:7825:B07:75A8              16     LOCAL
FD09:8:73:0:B505:626B:51D7:6DB6             16     LOCAL
FD09:8:73:0:D0B4:3316:7CE9:8AE8             16     LOCAL
FD09:8:73:0:ECA8:F5E:CCF5:FFD7              16     LOCAL

IP-SGT Active Bindings Summary
===============================================
Total number of LOCAL    bindings = 9
Total number of active   bindings = 9
```

show cts role-based counters

To clear all role-based counters on the AP, use the **show cts role-based counters** command:

show cts role-based counters

Syntax Description	This command has no arguments or keywords.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco Amsterdam 17.1.1	This command was introduced.

Examples

The following example shows the clear all role-based counters on the AP:

```
Device# show cts role-based counters

From  To    SW-Denied HW-Denied SW-Permitt HW-Permitt  SW-Monitor HW-Monitor
======================================================================
*     *     0         0         0          178837189  0          0
16    0     0         0         0          39250482   0          0
16    16    0         52835     0          0          0          0
17    16    0         0         0          0          0          0
```

show environment summary

To view a summary of all the environment-monitoring sensors, use the **show environment summary** command.

show environment summary

Syntax Description   This command has no arguments or keywords.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.
Cisco IOS XE Bengaluru 17.5.1	This command output was modified.

Example

The following is a sample output of the **show environment summary** command:

Example

```
Device# show environment summary


Number of Critical alarms:  0
Number of Major alarms:     0
Number of Minor alarms:     0

 Slot        Sensor         Current State   Reading
Threshold(Minor,Major,Critical,Shutdown)
----------  -------------  --------------- ------------
-------------------------------------
 P0         Vin            Normal          231  V AC    na
 P0         Iin            Normal          2    A       na
 P0         Vout           Normal          12   V DC    na
 P0         Iout           Normal          30   A       na
 P0         Temp1          Normal          25   Celsius (na ,na ,na ,na )(Celsius)
 P0         Temp2          Normal          31   Celsius (na ,na ,na ,na )(Celsius)
 P0         Temp3          Normal          37   Celsius (na ,na ,na ,na )(Celsius)
 R0         VDMB1: VX1     Normal          1226 mV      na
 R0         VDMB1: VX2     Normal          6944 mV      na
 R0         VDMB1: VX3     Normal          1226 mV      na
 R0         VDMB1: VX4     Normal          1000 mV      na
 R0         VDMB1: VP1     Normal          1789 mV      na
 R0         VDMB1: VP2     Normal          2555 mV      na
 R0         VDMB1: VP3     Normal          2556 mV      na
 R0         VDMB1: VP4     Normal          1049 mV      na
 R0         VDMB1: VH      Normal          11993mV      na
 R0         VDMB2: VX2     Normal          4975 mV      na
 R0         VDMB2: VX3     Normal          853  mV      na
 R0         VDMB2: VX4     Normal          907  mV      na
```

R0	VDMB2: VX5	Normal	1008	mV	na
R0	VDMB2: VP1	Normal	1787	mV	na
R0	VDMB2: VP2	Normal	3323	mV	na
R0	VDMB2: VH	Normal	12003	mV	na
R0	VDMB3: VX1	Normal	968	mV	na
R0	VDMB3: VX2	Normal	1002	mV	na
R0	VDMB3: VX5	Normal	5090	mV	na
R0	VDMB3: VP1	Normal	2492	mV	na
R0	VDMB3: VP2	Normal	1196	mV	na
R0	VDMB3: VP3	Normal	1512	mV	na
R0	VDMB3: VP4	Normal	1509	mV	na
R0	VDMB3: VH	Normal	11998	mV	na
R0	Temp: DMB IN	Normal	26	Celsius	(45 ,55 ,65 ,70)(Celsius)
R0	Temp: DMB OUT	Normal	40	Celsius	(70 ,75 ,80 ,85)(Celsius)
R0	Temp: Yoda 0	Normal	54	Celsius	(95 ,105,110,115)(Celsius)
R0	Temp: Yoda 1	Normal	62	Celsius	(95 ,105,110,115)(Celsius)
R0	Temp: CPU Die	Normal	43	Celsius	(100,110,120,125)(Celsius)
R0	Temp: FC FANS	Fan Speed 70%	26	Celsius	(29 ,39 ,0)(Celsius)
R0	VDDC1: VX1	Normal	1005	mV	na
R0	VDDC1: VX2	Normal	7084	mV	na
R0	VDDC1: VX3	Normal	950	mV	na
R0	VDDC1: VP1	Normal	1800	mV	na
R0	VDDC1: VP2	Normal	2493	mV	na
R0	VDDC1: VP3	Normal	3325	mV	na
R0	VDDC1: VH	Normal	12019	mV	na
R0	VDDC2: VX2	Normal	751	mV	na
R0	VDDC2: VX3	Normal	749	mV	na
R0	VDDC2: VX5	Normal	5076	mV	na
R0	VDDC2: VP1	Normal	1009	mV	na
R0	VDDC2: VP2	Normal	1008	mV	na
R0	VDDC2: VP3	Normal	1197	mV	na
R0	VDDC2: VP4	Normal	1514	mV	na
R0	VDDC2: VH	Normal	12003	mV	na
R0	Temp: DDC IN	Normal	25	Celsius	(55 ,65 ,75 ,80)(Celsius)
R0	Temp: DDC OUT	Normal	35	Celsius	(75 ,85 ,95 ,100)(Celsius)
P0	Stby Vin	Normal	230	V AC	na
P0	Stby Iin	Normal	2	A	na
P0	Stby Vout	Normal	12	V DC	na
P0	Stby Iout	Normal	32	A	na
P0	Stby Temp1	Normal	24	Celsius	(na ,na ,na ,na)(Celsius)
P0	Stby Temp2	Normal	29	Celsius	(na ,na ,na ,na)(Celsius)
P0	Stby Temp3	Normal	35	Celsius	(na ,na ,na ,na)(Celsius)
R0	Stby VDMB1: VX1	Normal	1225	mV	na
R0	Stby VDMB1: VX2	Normal	6979	mV	na
R0	Stby VDMB1: VX3	Normal	1226	mV	na
R0	Stby VDMB1: VX4	Normal	999	mV	na
R0	Stby VDMB1: VP1	Normal	1791	mV	na
R0	Stby VDMB1: VP2	Normal	2560	mV	na
R0	Stby VDMB1: VP3	Normal	2558	mV	na
R0	Stby VDMB1: VP4	Normal	1050	mV	na
R0	Stby VDMB1: VH	Normal	11977	mV	na
R0	Stby VDMB2: VX2	Normal	5005	mV	na
R0	Stby VDMB2: VX3	Normal	854	mV	na
R0	Stby VDMB2: VX4	Normal	878	mV	na
R0	Stby VDMB2: VX5	Normal	1008	mV	na
R0	Stby VDMB2: VP1	Normal	1789	mV	na
R0	Stby VDMB2: VP2	Normal	3312	mV	na
R0	Stby VDMB2: VH	Normal	11977	mV	na
R0	Stby VDMB3: VX1	Normal	972	mV	na
R0	Stby VDMB3: VX2	Normal	1001	mV	na
R0	Stby VDMB3: VX5	Normal	5060	mV	na
R0	Stby VDMB3: VP1	Normal	2497	mV	na
R0	Stby VDMB3: VP2	Normal	1199	mV	na
R0	Stby VDMB3: VP3	Normal	1510	mV	na

```
R0          Stby VDMB3: VP4 Normal       1511 mV      na
R0          Stby VDMB3: VH  Normal       11982mV      na
R0          Stby Temp: DMB INormal       22   Celsius (45 ,55 ,65 ,70 )(Celsius)
R0          Stby Temp: DMB ONormal       32   Celsius (70 ,75 ,80 ,85 )(Celsius)
R0          Stby Temp: Yoda Normal       43   Celsius (95 ,105,110,115)(Celsius)
R0          Stby Temp: Yoda Normal       45   Celsius (95 ,105,110,115)(Celsius)
R0          Stby Temp: CPU DNormal       33   Celsius (100,110,120,125)(Celsius)
R0          Stby Temp: FC FAFan Speed 70%  22   Celsius (29 ,39 ,0  )(Celsius)
R0          Stby VDDC1: VX1 Normal        1005 mV      na
R0          Stby VDDC1: VX2 Normal        7070 mV      na
R0          Stby VDDC1: VX3 Normal        949  mV      na
R0          Stby VDDC1: VP1 Normal        1814 mV      na
R0          Stby VDDC1: VP2 Normal        2501 mV      na
R0          Stby VDDC1: VP3 Normal        3331 mV      na
R0          Stby VDDC1: VH  Normal        11993mV      na
R0          Stby VDDC2: VX2 Normal        752  mV      na
R0          Stby VDDC2: VX3 Normal        750  mV      na
R0          Stby VDDC2: VX5 Normal        5052 mV      na
R0          Stby VDDC2: VP1 Normal        1009 mV      na
R0          Stby VDDC2: VP2 Normal        994  mV      na
R0          Stby VDDC2: VP3 Normal        1195 mV      na
R0          Stby VDDC2: VP4 Normal        1514 mV      na
R0          Stby VDDC2: VH  Normal        11993mV      na
R0          Stby Temp: DDC INormal        22   Celsius (55 ,65 ,75 ,80 )(Celsius)
R0          Stby Temp: DDC ONormal        28   Celsius (75 ,85 ,95 ,100)(Celsius)
```

show etherchannel summary

To show details on the ports, port-channel, and protocols in the controller, use the **show etherchannel summary** command.

show ethernet summary

This command has no arguments or keywords.

Command Default	None

Command Modes	Privileged Mode.

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows the details on the ports, port-channel, and protocols in the controller.

```
controller#show etherchannel summary
Flags:  D - down        P - bundled in port-channel
        I - stand-alone s - suspended
        H - Hot-standby (LACP only)
        R - Layer3      S - Layer2
        U - in use      f - failed to allocate aggregator

        M - not in use, minimum links not met
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port


Number of channel-groups in use: 2
Number of aggregators:           2

Group  Port-channel  Protocol    Ports
------+------------+-----------+-------------------------------------------
2      Po2(SD)         -
23     Po23(SD)        -
```

show fips authorization-key

To view the installed authorization key, use the **show fips authorization-key** command.

show fips authorization-key

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

This example shows how to view the installed authorization key:

```
Device# show fips authorization-key
FIPS: Stored key (16) : 12345678901234567890123456789012
```

show fips status

To view the status of FIPS on the device, use the **show fips status** command.

show fips status

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

This example shows how to view the status of FIPS on the device:

```
Device# show fips status
Chassis is running in fips mode
```

show flexconnect office-extend diagnostics

To display the results of the network diagnostics for all flexconnect OfficeExtend AP, use the **show flexconnect office-extend diagnostics** command.

show flexconnect office-extend diagnostics

Syntax Description	This command has no keywords or arguments.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Usage Guidelines To get periodic details for latency (current, minimum, or maximum) ensure that you enable link-latency under the ap profile, as given in the following example:

```
Device(config)# ap profile default-ap-profile
Device(config-ap-profile)# link-latency
```

If the above configuration is not in place, you will only see the following output:

```
Summary of OfficeExtend AP Link Latency

CAPWAP Latency Heartbeat

Current: current latency (ms)
Min: minimum latency (ms)
Max: maximum latency (ms)

Link Test

Upload: DTLS Upload (Mbps)
Latency: DTLS Link Latency (ms)
Jitter: DTLS Link Jitter (ms)

AP Name Last Latency Heartbeat from AP Current Max Min Last Link Test Run Upload Latency
Jitter
_____
ap-18   Disabled                        -      -   -  12/04/20 11:08:58   16     3
0
```

Examples This following example shows how to display the network diagnostics information for OfficeExtend AP.

```
Device# show flexconnect office-extend diagnostics

Summary of OfficeExtend AP Link Latency

CAPWAP Latency Heartbeat

Current: current latency (ms)
```

```
Min: minimum latency (ms)
Max: maximum latency (ms)

Link Test

Upload: DTLS Upload (Mbps)
Latency: DTLS Link Latency (ms)
Jitter: DTLS Link Jitter (ms)

AP Name Last Latency Heartbeat from AP Current Max Min Last Link Test Run Upload Latency
Jitter
----------------------------------------------------------------------------------------------
ap-18    1 minute 1 second              0        0   0  12/04/20 09:19:48  8        2
0
```

show flow exporter

To display flow exporter status and statistics, use the **show flow exporter** command in privileged EXEC mode.

show flow exporter [**export-ids netflow-v9** | [**name**] *exporter-name* [**statistics** | **templates**] | **statistics** | **templates**]

Syntax Description		
export-ids netflow-v9	(Optional) Displays the NetFlow Version 9 export fields that can be exported and their IDs.
name	(Optional) Specifies the name of a flow exporter.
exporter-name	(Optional) Name of a flow exporter that was previously configured.
statistics	(Optional) Displays statistics for all flow exporters or for the specified flow exporter.
templates	(Optional) Displays template information for all flow exporters or for the specified flow exporter.

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

The following example displays the status and statistics for all of the flow exporters configured on a device:

```
Device# show flow exporter
Flow Exporter FLOW-EXPORTER-1:
  Description:            Exports to the datacenter
  Export protocol:       NetFlow Version 9
  Transport Configuration:
    Destination IP address: 192.168.0.1
    Source IP address:    192.168.0.2
    Transport Protocol:   UDP
    Destination Port:     9995
    Source Port:          55864
    DSCP:                 0x0
    TTL:                  255
    Output Features:      Used
```

This table describes the significant fields shown in the display:

Table 12: show flow exporter Field Descriptions

Field	Description
Flow Exporter	The name of the flow exporter that you configured.

Field	Description
Description	The description that you configured for the exporter, or the default description User defined.
Transport Configuration	The transport configuration fields for this exporter.
Destination IP address	The IP address of the destination host.
Source IP address	The source IP address used by the exported packets.
Transport Protocol	The transport layer protocol used by the exported packets.
Destination Port	The destination UDP port to which the exported packets are sent.
Source Port	The source UDP port from which the exported packets are sent.
DSCP	The differentiated services code point (DSCP) value.
TTL	The time-to-live value.
Output Features	Specifies whether the **output-features** command, which causes the output features to be run on Flexible NetFlow export packets, has been used or not.

The following example displays the status and statistics for all of the flow exporters configured on a device:

```
Device# show flow exporter name FLOW-EXPORTER-1 statistics
Flow Exporter FLOW-EXPORTER-1:
  Packet send statistics (last cleared 2w6d ago):
    Successfully sent:         0                      (0 bytes)
```

show flow interface

To display the configuration and status for an interface, use the **show flow interface** command in privileged EXEC mode.

show flow interface [*type number*]

Syntax Description	*type*	(Optional) The type of interface on which you want to display accounting configuration information.
	number	(Optional) The number of the interface on which you want to display accounting configuration information.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples

The following example displays the accounting configuration on Ethernet interfaces 0/0 and 0/1:

```
Device# show flow interface gigabitethernet1/0/1

Interface Ethernet1/0
        monitor:         FLOW-MONITOR-1
        direction:       Output
        traffic(ip):     on
Device# show flow interface gigabitethernet1/0/2
Interface Ethernet0/0
        monitor:         FLOW-MONITOR-1
        direction:       Input
        traffic(ip):     sampler SAMPLER-2#
```

The table below describes the significant fields shown in the display.

Table 13: show flow interface Field Descriptions

Field	Description
Interface	The interface to which the information applies.
monitor	The name of the flow monitor that is configured on the interface.
direction:	The direction of traffic that is being monitored by the flow monitor. The possible values are: • Input—Traffic is being received by the interface. • Output—Traffic is being transmitted by the interface.

Field	Description
traffic(ip)	Indicates if the flow monitor is in normal mode or sampler mode. The possible values are: • on—The flow monitor is in normal mode. • sampler—The flow monitor is in sampler mode (the name of the sampler will be included in the display).

show flow monitor

To display the status and statistics for a flow monitor, use the **show flow monitor** command in privileged EXEC mode.

Syntax Description

name	(Optional) Specifies the name of a flow monitor.
monitor-name	(Optional) Name of a flow monitor that was previously configured.
cache	(Optional) Displays the contents of the cache for the flow monitor.
format	(Optional) Specifies the use of one of the format options for formatting the display output.
csv	(Optional) Displays the flow monitor cache contents in comma-separated variables (CSV) format.
record	(Optional) Displays the flow monitor cache contents in record format.
table	(Optional) Displays the flow monitor cache contents in table format.
statistics	(Optional) Displays the statistics for the flow monitor.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The **cache** keyword uses the record format by default.

The uppercase field names in the display output of the **show flowmonitor** *monitor-name* **cache** command are key fields that uses to differentiate flows. The lowercase field names in the display output of the **show flow monitor** *monitor-name* **cache** command are nonkey fields from which collects values as additional data for the cache.

Examples   The following example displays the status for a flow monitor:

```
Device# show flow monitor FLOW-MONITOR-1

Flow Monitor FLOW-MONITOR-1:
  Description:      Used for basic traffic analysis
  Flow Record:      flow-record-1
  Flow Exporter:    flow-exporter-1
                    flow-exporter-2
  Cache:
    Type:            normal
    Status:          allocated
    Size:            4096 entries / 311316 bytes
    Inactive Timeout: 15 secs
    Active Timeout:  1800 secs
```

This table describes the significant fields shown in the display.

Table 14: show flow monitor monitor-name Field Descriptions

Field	Description
Flow Monitor	Name of the flow monitor that you configured.
Description	Description that you configured or the monitor, or the default description User defined.
Flow Record	Flow record assigned to the flow monitor.
Flow Exporter	Exporters that are assigned to the flow monitor.
Cache	Information about the cache for the flow monitor.
Type	Flow monitor cache type. The value is always normal, as it is the only supported cache type.
Status	Status of the flow monitor cache. The possible values are: • allocated—The cache is allocated. • being deleted—The cache is being deleted. • not allocated—The cache is not allocated.
Size	Current cache size.
Inactive Timeout	Current value for the inactive timeout in seconds.
Active Timeout	Current value for the active timeout in seconds.

The following example displays the status, statistics, and data for the flow monitor named FLOW-MONITOR-1:

This table describes the significant fields shown in the display.

The following example displays the status, statistics, and data for the flow monitor named FLOW-MONITOR-1 in a table format:

The following example displays the status, statistics, and data for the flow monitor named FLOW-MONITOR-IPv6 (the cache contains IPv6 data) in record format:

The following example displays the status and statistics for a flow monitor:

show flow record

To display the status and statistics for a flow record, use the **show flow record** command in privileged EXEC mode.

show flow record [[**name**] *record-name*]

Syntax Description	**name**	(Optional) Specifies the name of a flow record.
	record-name	(Optional) Name of a user-defined flow record that was previously configured.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

The following example displays the status and statistics for FLOW-RECORD-1:

```
Device# show flow record FLOW-RECORD-1
flow record FLOW-RECORD-1:
  Description:        User defined
  No. of users:        0
  Total field space:  24 bytes
  Fields:
    match ipv6 destination address
    match transport source-port
    collect interface input
```

show flow record wireless avc basic

To view information about the flow records for wireless avc basic, use the **show flow record wireless avc basic** command.

show flow record wireless avc basic

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to see information about the flow records for wireless avc basic:

```
Device# show flow record wireless avc basic

flow record wireless avc basic:
  Description:       Basic Wireless AVC template
  No. of users:      1
  Total field space: 78 bytes
  Fields:
    match ipv4 protocol
    match ipv4 source address
    match ipv4 destination address
    match transport source-port
    match transport destination-port
    match flow direction
    match application name
    match wireless ssid
    collect counter bytes long
    collect counter packets long
    collect wireless ap mac address
    collect wireless client mac address
```

show flow record wireless avc ipv6 basic

To view information about the flow records for wireless avc ipv6 basic, use the **show flow record wireless avc ipv6 basic** command.

show flow record wireless avc ipv6 basic

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to see information about the flow records for wireless avc ipv6 basic:

```
Device# show flow record wireless avc ipv6 basic

flow record wireless avc ipv6 basic:
  Description:        Ipv6 Wireless AVC flow template
  No. of users:       1
  Total field space:  102 bytes
  Fields:
    match ipv6 protocol
    match ipv6 source address
    match ipv6 destination address
    match transport source-port
    match transport destination-port
    match flow direction
    match wireless ssid
    collect counter bytes long
    collect counter packets long
    collect application name
    collect wireless ap mac address
    collect wireless client mac address
```

show gnxi state

To verify the gnxi details, use the **show gnxi state** command.

show gnxi state

Syntax Description

detail	Displays the gnxi detailed state.
stats	Displays the gnxi operational statistics.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

The following example shows how to verify the gnxi details:

```
Device# show gnxi state detail
Settings
========
Server: Enabled
Server port: 50052
Secure server: Disabled
Secure server port: 5000
Secure client authentication: Enabled
Secure trustpoint: test
Secure client trustpoint:
Secure password authentication: Disabled

GNMI
====
Admin state: Enabled
Oper status: Up
State: Provisioned

gRPC Server
-----------
Admin state: Enabled
Oper status: Up

Configuration service
---------------------
Admin state: Enabled
Oper status: Up

Telemetry service
-----------------
Admin state: Enabled
Oper status: Up

GNOI
```

```
====

Cert Management service
-----------------
Admin state: Enabled
Oper status: Up

OS Image service
----------------
Admin state: Disabled
Oper status: Up
Supported: Not supported on this platform
```

show history channel interface dot11Radio all

To check channel change or trigger reason and history, use the **show history channel interface dot11Radio all** command.

show history channel interface dot11Radio all

Syntax Description
This command has no keywords or arguments.

Command Default
None

Command Modes
Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Examples
This example shows how to check channel change or trigger reason and history:

```
Device# show history channel interface dot11Radio all

                Timestamp Slot Client count Channel Trigger
Fri May 31 12:57:04 2019    0            0      11 RRM-DCA
Fri May 31 13:10:02 2019    0            0       1 RRM-DCA
Fri May 31 12:57:04 2019    1            0      60  Manual
Fri May 31 13:00:16 2019    1            0     149    DFS
```

show interfaces

To display the administrative and operational status of all interfaces or for a specified interface, use the **show interfaces** command in privileged EXEC mode.

show interfaces [*interface-id* | **vlan** *vlan-id*] [**accounting** | **capabilities** [**module** *number*] | **debounce** | **description** | **etherchannel** | **flowcontrol** | **private-vlan mapping** | **pruning** | **stats** | **status** [**err-disabled**] | **trunk**]

Syntax Description		
interface-id	(Optional) ID of the interface. Valid interfaces include physical ports (including type, stack member , module, and port number) and port channels. The port channel range is 1 to 48.	
vlan *vlan-id*	(Optional) VLAN identification. The range is 1 to 4094.	
accounting	(Optional) Displays accounting information on the interface, including active protocols and input and output packets and octets.	
	Note The display shows only packets processed in software; hardware-switched packets do not appear.	
capabilities	(Optional) Displays the capabilities of all interfaces or the specified interface, including the features and options that you can configure on the interface. Though visible in the command line help, this option is not available for VLAN IDs.	
module *number*	(Optional) Displays capabilities of all interfaces on the switch or specified stack member.	
	This option is not available if you entered a specific interface ID.	
description	(Optional) Displays the administrative status and description set for an interface.	
etherchannel	(Optional) Displays interface EtherChannel information.	
flowcontrol	(Optional) Displays interface flow control information.	
private-vlan mapping	(Optional) Displays private-VLAN mapping information for the VLAN switch virtual interfaces (SVIs). This keyword is not available if the switch is running the LAN base feature set.	
pruning	(Optional) Displays trunk VTP pruning information for the interface.	
stats	(Optional) Displays the input and output packets by switching the path for the interface.	
status	(Optional) Displays the status of the interface. A status of unsupported in the Type field means that a non-Cisco small form-factor pluggable (SFP) module is inserted in the module slot.	

| err-disabled | (Optional) Displays interfaces in an error-disabled state. |
| trunk | (Optional) Displays interface trunk information. If you do not specify an interface, only information for active trunking ports appears. |

Note Though visible in the command-line help strings, the **crb**, **fair-queue**, **irb**, **mac-accounting**, **precedence**, **random-detect**, **rate-limit**, and **shape** keywords are not supported.

| **Command Default** | None |

| **Command Modes** | Privileged EXEC |

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines The **show interfaces capabilities** command with different keywords has these results:

- Use the **show interface capabilities module** *number* command to display the capabilities of all interfaces on that chassis in the stack. If there is no chassis with that module number in the stack, there is no output.

- Use the **show interfaces** *interface-id* **capabilities** to display the capabilities of the specified interface.

- Use the **show interfaces capabilities** (with no module number or interface ID) to display the capabilities of all interfaces in the stack.

This is an example of output from the **show interfaces** command for an interface on stack member 3:

```
Device# show interfaces gigabitethernet3/0/2
GigabitEthernet3/0/2 is down, line protocol is down (notconnect)
  Hardware is Gigabit Ethernet, address is 2037.064d.4381 (bia 2037.064d.4381)
  MTU 1500 bytes, BW 1000000 Kbit/sec, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Auto-duplex, Auto-speed, media type is 10/100/1000BaseTX
  input flow-control is off, output flow-control is unsupported
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/2000/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts (0 multicasts)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog, 0 multicast, 0 pause input
     0 input packets with dribble condition detected
     0 packets output, 0 bytes, 0 underruns
```

```
        0 output errors, 0 collisions, 1 interface resets
        0 unknown protocol drops
        0 babbles, 0 late collision, 0 deferred
        0 lost carrier, 0 no carrier, 0 pause output
        0 output buffer failures, 0 output buffers swapped out
```

This is an example of output from the **show interfaces** *interface* **description** command when the interface has been described as *Connects to Marketing* by using the **description** interface configuration command:

```
Device# show interfaces gigabitethernet1/0/2 description
Interface                       Status      Protocol Description
Gi1/0/2                         up          down     Connects to Marketing
```

This is an example of output from the **show interfaces** *interface-id* **pruning** command when pruning is enabled in the VTP domain:

```
Device# show interfaces gigabitethernet1/0/2 pruning
Port      Vlans pruned for lack of request by neighbor
Gi1/0/2   3,4

Port      Vlans traffic requested of neighbor
Gi1/0/2   1-3
```

This is an example of output from the **show interfaces stats** command for a specified VLAN interface:

```
Device# show interfaces vlan 1 stats
Switching path    Pkts In     Chars In     Pkts Out    Chars Out
    Processor     1165354     136205310      570800     91731594
  Route cache           0             0           0            0
        Total     1165354     136205310      570800     91731594
```

These are examples of output from the **show interfaces status** command for a specific interface when private VLANs are configured. Port 22 is configured as a private-VLAN host port. It is associated with primary VLAN 20 and secondary VLAN 25:

```
Device# show interfaces gigabitethernet1/0/22 status
Port        Name      Status      Vlan     Duplex     Speed     Type
Gi1/0/22              connected   20,25    a-full     a-100     10/100BaseTX
```

In this example, port 20 is configured as a private-VLAN promiscuous port. The display shows only the primary VLAN 20:

```
Device# show interfaces gigabitethernet1/0/20 status
Port        Name      Status      Vlan     Duplex     Speed     Type
Gi1/0/20              connected   20       a-full     a-100     10/100BaseTX
```

This is an example of output from the **show interfaces status err-disabled** command. It displays the status of interfaces in the error-disabled state:

```
Device# show interfaces status err-disabled
Port      Name      Status        Reason
Gi1/0/2             err-disabled  gbic-invalid
Gi2/0/3             err-disabled  dtp-flap
```

This is an example of output from the **show interfaces** *interface-id* **pruning** command:

```
Device# show interfaces gigabitethernet1/0/2 pruning
Port Vlans pruned for lack of request by neighbor


Device# show interfaces gigabitethernet1/0/1 trunk
Port         Mode              Encapsulation  Status        Native vlan
Gi1/0/1      on                802.1q         other         10

Port         Vlans allowed on trunk
Gi1/0/1      none

Port         Vlans allowed and active in management domain
Gi1/0/1      none

Port         Vlans in spanning tree forwarding state and not pruned
Gi1/0/1      none
```

show interfaces dot11Radio asr-info

To view advanced scheduling request statistics along with advanced scheduling request capability and uplink latency statistics for advanced scheduling request clients on a WLAN, use the **show interfaces dot11Radio asr-info** command.

show interfaces dot11Radio asr-info *radio-interface-number* { **all** | *mac-address* }

Syntax Description *radio-interface-number*	Interface number for 802.11 radio.
all	Displays advanced scheduling request statistics along with advanced scheduling request capability and uplink latency statistics for all the advanced scheduling request clients on a WLAN.
mac-address	MAC address of the AP.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.4.1	This command was introduced

Examples

The following example shows how to view advanced scheduling request statistics along with advanced scheduling request capability and uplink latency statistics for all the advanced scheduling request clients on a WLAN:

```
Device# show interfaces dot11Radio 1 asr-info all

[*10/12/2020 18:45:21.0149]
[*10/12/2020 18:45:21.0150]  Client-MAC:[26:52:CF:C8:D0:1C] AID:[3] ASR-Capability:[0x1]
[*10/12/2020 18:45:21.0150]  BE- LAT[0-20]:[267] LAT[20-40]:[57] LAT[40-100]:[32]
LAT[>100]:[26]
[*10/12/2020 18:45:21.0150]  BK- LAT[0-20]:[0] LAT[20-40]:[0] LAT[40-100]:[0] LAT[>100]:[0]
[*10/12/2020 18:45:21.0150]  VI- LAT[0-20]:[0] LAT[20-40]:[0] LAT[40-100]:[0] LAT[>100]:[0]
[*10/12/2020 18:45:21.0150]  VO- LAT[0-20]:[2222] LAT[20-40]:[409] LAT[40-100]:[224]
LAT[>100]:[163]
[*10/12/2020 18:45:21.0150]
[*10/12/2020 18:45:21.0206] HTT_PEER_DETAILS_TLV:
[*10/12/2020 18:45:21.0206] peer_type = 0
[*10/12/2020 18:45:21.0206] sw_peer_id = 98
[*10/12/2020 18:45:21.0206] vdev_id = 25
[*10/12/2020 18:45:21.0206] pdev_id = 0
[*10/12/2020 18:45:21.0206] ast_idx = 1187
[*10/12/2020 18:45:21.0206] mac_addr = 26:52:cf:c8:d0:1c
[*10/12/2020 18:45:21.0206] peer_flags = 0x200006f9
[*10/12/2020 18:45:21.0206] qpeer_flags = 0x8
[*10/12/2020 18:45:21.0206]
[*10/12/2020 18:45:21.0206] HTT_STATS_PEER_ASR_STATS_TLV
[*10/12/2020 18:45:21.0206] asr_bmap: 0x8
[*10/12/2020 18:45:21.0206] asr_muedca_update_cnt: 1
[*10/12/2020 18:45:21.0206] asr_muedca_reset_cnt: 1
```

```
[*10/12/2020 18:45:21.0206] asr_ul_mu_bsr_trigger: 2376
[*10/12/2020 18:45:21.0206] asr_min_trig_intv- BE:0          BK:0 VI:0 VO:19
[*10/12/2020 18:45:21.0206] asr_max_trig_intv- BE:0          BK:0 VI:0 VO:20
[*10/12/2020 18:45:21.0207] asr_min_alloc_rate- BE:0          BK:0 VI:0 VO:12
[*10/12/2020 18:45:21.0207] asr_ul_su_data_ppdu_cnt- BE:0        BK:0 VI:0 VO:2149
[*10/12/2020 18:45:21.0207] asr_ul_su_data_ppdu_bytes- BE:0        BK:0 VI:0 VO:757546
[*10/12/2020 18:45:21.0207] asr_ul_mu_trig_ppdu_cnt- BE:0        BK:0 VI:0 VO:5002
[*10/12/2020 18:45:21.0207] asr_ul_mu_trig_ppdu_bytes- BE:0         BK:0 VI:0 VO:2400960
[*10/12/2020 18:45:21.0207] asr_ul_mu_data_ppdu_cnt- BE:0        BK:0 VI:0 VO:2134
[*10/12/2020 18:45:21.0207] asr_ul_mu_data_ppdu_bytes- BE:0         BK:0 VI:0 VO:736578
[*10/12/2020 18:45:21.0207] asr_ul_mu_data_padding_bytes- BE:0          BK:0 VI:0 VO:2953488
```

show interfaces wired

To view the wired interface details, use the **show interfaces wired** command.

show interfaces wired *wired-interface-number*

Syntax Description

wired-interface-number	Wired interface number.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Examples

This example shows how to view the wired interface details:

```
Device# show interfaces wired 0

wired0    Link encap:Ethernet  HWaddr C8:8B:5E:BA:D0 eMac Status: UP
          inet addr:20.200.51.14  Bcast:20.255.255.255  Mask:255.255.255.255
          UP BROADCAST RUNNING PROMISC MULTICAST  MTU:2400  Metric:1
          full Duplex, 1000 Mb/s

Wired0 Port Statistics:
ID         :               2          TYPE       :               0
RX PKTS    :          35109/431       TX PKTS    :            1307/11
RX OCTETS  :        2899435/34925     TX OCTETS  :         377424/1575
RX ERR     :            287/0         TX ERR     :               0/0
```

show inventory

To display the product inventory listing of all Cisco products installed in the networking device, use the **show inventory** command.

show inventory [*entity-name* | [**fru** | **oid** | **raw**] *entity-name*]

Syntax Description		
entity-name	(Optional) Name of a Cisco entity (for example, chassis, backplane, module, or slot). A quoted string may be used to display very specific UDI information; for example "sfslot 1" shows the UDI information for slot 1 of an entity named sfslot.
fru	(Optional) To display the component details of the **fru** entities within the container hierarchy in Cisco products.
oid	(Optional) To display the vendor specific hardware registration number for each part of the device.
raw	(Optional) To view the information about all Cisco products—referred to as entities—installed in the Cisco networking device, even if the entities do not have a product ID (PID) value, a unique device identifier (UDI), or other physical identification.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines The **show inventory** command retrieves and displays inventory information about each Cisco product in the form of a UDI. The UDI is a combination of three separate data elements: a product identifier (PID), a version identifier (VID), and the serial number (SN).

The PID is the name by which the product can be ordered; it has been historically called the "Product Name" or "Part Number." This is the identifier that one would use to order an exact replacement part.

The VID is the version of the product. Whenever a product has been revised, the VID will be incremented. The VID is incremented according to a rigorous process derived from Telcordia GR-209-CORE, an industry guideline that governs product change notices.

The SN is the vendor-unique serialization of the product. Each manufactured product will carry a unique serial number assigned at the factory, which cannot be changed in the field. This is the means by which to identify an individual, specific instance of a product.

The UDI refers to each product as an entity. Some entities, such as a chassis, will have subentities like slots. Each entity will display on a separate line in a logically ordered presentation that is arranged hierarchically by Cisco entities.

Use the **show inventory** command without options to display a list of Cisco entities installed in the networking device that are assigned a PID.

Examples

This example shows how to display the product inventory listing of a Cisco product installed in the networking device:

```
Device# show inventory

NAME: "module R0", DESCR: "Cisco C9800-CL Route Processor"
PID: C9800-CL-K9       , VID: V00  , SN: Jxx1xxxxx1x
```

show ip

To view the IP information, use the **show ip** command.

Syntax Description	

access-lists	Lists the IP access lists
interface	Displays the IP interface status and configuration
brief	Displays the brief summary of IP status and configuration
route	Displays the IP routing table
tunnel	Displays the IP tunnel information
eogre	Displays the EoGRE tunnel information
domain	Displays the EoGRE tunnel domain information
forwarding-table	Displays the EoGRE tunnel encapsulation and decapsulation information
gateway	Displays the EoGRE tunnel gateway information
fabric	Displays the IP fabric tunnel information
summary	Displays the information for all tunnels

Command Modes User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
8.1.111.0	This command was introduced.

The following example shows how to view information about the lists the IP access lists:

```
cisco-wave2-ap# show ip access-lists
```

show ip igmp snooping igmpv2-tracking

To display group and IP address entries, use the **show ip igmp snooping igmpv2-tracking** command in privileged EXEC mode.

✎

Note   The command displays group and IP address entries only for wireless multicast IGMP joins and not for wired joins. This command also displays output only if wireless multicast is enabled.

show ip igmp snooping igmpv2-tracking

Syntax Description   This command has no arguments or keywords.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

show ip igmp snooping querier

To display the configuration and operation information for the IGMP querier that is configured on a device, use the **show ip igmp snooping querier**command in user EXEC mode.

show ip igmp snooping querier [**vlan** *vlan-id*]　[**detail**]

Syntax Description		
vlan *vlan-id*	(Optional) Specifies a VLAN; Ranges are from 1—1001 and 1006—4094.	
detail	(Optional) Displays detailed IGMP querier information.	

Command Modes　User EXEC

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines　Use the **show ip igmp snooping querier** command to display the IGMP version and the IP address of a detected device, also called a querier, that sends IGMP query messages. A subnet can have multiple multicast routers but only one IGMP querier. In a subnet running IGMPv2, one of the multicast routers is elected as the querier. The querier can be a Layer 3 device.

The **show ip igmp snooping querier** command output also shows the VLAN and the interface on which the querier was detected. If the querier is the device, the output shows the Port field as Router. If the querier is a router, the output shows the port number on which the querier was detected in the Port field.

The **show ip igmp snooping querier detail** user EXEC command is similar to the **show ip igmp snooping querier** command. However, the **show ip igmp snooping querier** command displays only the device IP address most recently detected by the device querier.

The **show ip igmp snooping querier detail** command displays the device IP address most recently detected by the device querier and this additional information:

• The elected IGMP querier in the VLAN

• The configuration and operational information pertaining to the device querier (if any) that is configured in the VLAN

Expressions are case sensitive, for example, if you enter | **exclude output**, the lines that contain "output" do not appear, but the lines that contain "Output" appear.

Examples

The following is a sample output from the **show ip igmp snooping querier** command:

```
Device> show ip igmp snooping querier
Vlan     IP Address    IGMP Version      Port
-------------------------------------------------
1        172.20.50.11  v3                Gi1/0/1
2        172.20.40.20  v2                Router
```

The following is a sample output from the **show ip igmp snooping querier detail** command:

```
Device> show ip igmp snooping querier detail

Vlan       IP Address      IGMP Version    Port
------------------------------------------------------------
1          10.0.0.10       v2              Fa8/0/1
Global IGMP device querier status


----------------------------------------------------------
admin state                   : Enabled
admin version                 : 2
source IP address             : 0.0.0.0
query-interval (sec)          : 60
max-response-time (sec)       : 10
querier-timeout (sec)         : 120
tcn query count               : 2
tcn query interval (sec)      : 10
Vlan 1:   IGMP device querier status
----------------------------------------------------------
elected querier is 10.0.0.10         on port Fa8/0/1
----------------------------------------------------------
admin state                   : Enabled
admin version                 : 2
source IP address             : 10.1.1.65
query-interval (sec)          : 60
max-response-time (sec)       : 10
querier-timeout (sec)         : 120
tcn query count               : 2
tcn query interval (sec)      : 10
operational state             : Non-Querier
operational version           : 2
tcn query pending count       : 0
```

show ip igmp snooping wireless mcast-spi-count

To display the statistics of the number of multicast stateful packet inspections (SPIs) per multicast group ID (MGID) sent to the device, use the **show ip igmp snooping wireless mcast-spi-count** command in privileged EXEC mode.

show ip igmp snooping wireless mcast-spi-count

This command has no arguments or keywords.

| **Command Default** | None |

| **Command Modes** | Privileged EXEC |

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

| **Usage Guidelines** | None |

Examples

This is an example of output from the **show ip igmp snooping wireless mcast-spi-count** command:

```
Device# show ip igmp snooping wireless mcast-spi-count

Stats for Mcast Client Add/Delete SPI Messages Sent to WCM

MGID    ADD MSGs       Del MSGs
-------------------------------
4160    1323           667
```

show ip igmp snooping wireless mgid

To display multicast group ID (MGID) mappings, use the **show ip igmp snooping wireless mgid** command in privileged EXEC mode.

show ip igmp snooping wireless mgid

Syntax Description	This command has no arguments or keywords.
Command Default	None
Command Modes	Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines None

Examples

This is an example of output from the **show ip igmp snooping wireless mgid** command:

```
Device# show ip igmp snooping wireless mgid

Total number of L2-MGIDs   = 0

Total number of MCAST MGIDs = 0

 Wireless multicast is Enabled in the system
 Vlan    bcast    nonip-mcast   mcast    mgid    Stdby Flags
 1     Disabled   Disabled    Enabled   Disabled  0:0:1:0
 25    Disabled   Disabled    Enabled   Disabled  0:0:1:0
 34    Disabled   Disabled    Enabled   Disabled  0:0:1:0
 200   Disabled   Disabled    Enabled   Disabled  0:0:1:0
 1002  Enabled    Enabled     Enabled   Disabled  0:0:1:0
 1003  Enabled    Enabled     Enabled   Disabled  0:0:1:0
 1004  Enabled    Enabled     Enabled   Disabled  0:0:1:0
 1005  Enabled    Enabled     Enabled   Disabled  0:0:1:0

Index  MGID              (S, G, V)
-------------------------------------------------------
```

show ip nbar protocol-discovery wlan

To see NBAR protocol discovery statistics for a WLAN, use the **show ip nbar protocol-discovery wlan** command.

show ip nbar protocol-discovery wlan *wlan-name*

Syntax Description

wlan-name	Name of the WLAN.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the NBAR protocol discovery statistics for a WLAN named *mywlan*:

```
Device# show ip nbar protocol-discovery wlan mywlan
```

show ipv6 access-list

To display the contents of all current IPv6 access lists, use the **show ipv6 access-list** command in user EXEC or privileged EXEC mode.

show ipv6 access-list [*access-list-name*]

Syntax Description	*access-list-name*	(Optional) Name of access list.

Command Default

All IPv6 access lists are displayed.

Command Modes

User EXEC

Privileged EXEC

Command History

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

The **show ipv6 access-list** command provides output similar to the **show ip access-list** command, except that it is IPv6-specific.

Examples

The following output from the **show ipv6 access-list** command shows IPv6 access lists named inbound, tcptraffic, and outbound:

```
Device# show ipv6 access-list
IPv6 access list inbound
    permit tcp any any eq bgp reflect tcptraffic (8 matches) sequence 10
    permit tcp any any eq telnet reflect tcptraffic (15 matches) sequence 20
    permit udp any any reflect udptraffic sequence 30
IPv6 access list tcptraffic (reflexive) (per-user)
    permit tcp host 2001:0DB8:1::1 eq bgp host 2001:0DB8:1::2 eq 11000 timeout 300 (time
        left 243) sequence 1
    permit tcp host 2001:0DB8:1::1 eq telnet host 2001:0DB8:1::2 eq 11001 timeout 300
    (time left 296) sequence 2
IPv6 access list outbound
    evaluate udptraffic
    evaluate tcptraffic
```

The following sample output shows IPv6 access list information for use with IPSec:

```
Device#  show ipv6 access-list
IPv6 access list Tunnel0-head-0-ACL (crypto)
    permit ipv6 any any (34 matches) sequence 1
IPv6 access list Ethernet2/0-ipsecv6-ACL (crypto)
    permit 89 FE80::/10 any (85 matches) sequence 1
```

The table below describes the significant fields shown in the display.

Table 15: show ipv6 access-list Field Descriptions

Field	Description
ipv6 access list inbound	Name of the IPv6 access list, for example, inbound.
permit	Permits any packet that matches the specified protocol type.
tcp	Transmission Control Protocol. The higher-level (Layer 4) protocol type that the packet must match.
any	Equal to ::/0.
eq	An equal operand that compares the source or destination ports of TCP or UDP packets.
bgp	Border Gateway Protocol. The lower-level (Layer 3) protocol type that the packet must be equal to.
reflect	Indicates a reflexive IPv6 access list.
tcptraffic (8 matches)	The name of the reflexive IPv6 access list and the number of matches for the access list. The **clear ipv6 access-list** privileged EXEC command resets the IPv6 access list match counters.
sequence 10	Sequence in which an incoming packet is compared to lines in an access list. Lines in an access list are ordered from first priority (lowest number, for example, 10) to last priority (highest number, for example, 80).
host 2001:0DB8:1::1	The source IPv6 host address that the source address of the packet must match.
host 2001:0DB8:1::2	The destination IPv6 host address that the destination address of the packet must match.
11000	The ephemeral source port number for the outgoing connection.
timeout 300	The total interval of idle time (in seconds) after which the temporary IPv6 reflexive access list named tcptraffic will time out for the indicated session.
(time left 243)	The amount of idle time (in seconds) remaining before the temporary IPv6 reflexive access list named tcptraffic is deleted for the indicated session. Additional received traffic that matches the indicated session resets this value to 300 seconds.
evaluate udptraffic	Indicates the IPv6 reflexive access list named udptraffic is nested in the IPv6 access list named outbound.

show ipv6 hop-by-hop status

To display information about IPv6 hop-by-hop header processing, use the **show ipv6 hop-by-hop status** command.

show ipv6 hop-by-hop status

Syntax Description	This command has no arguments or keywords.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Examples

The following example displays information about IPv6 hop-by-hop header processing:

```
Device# show ipv6 hop-by-hop status
```

show ipv6 mld snooping

Use the **show ipv6 mld snooping** command in EXEC mode to display IP version 6 (IPv6) Multicast Listener Discovery (MLD) snooping configuration of the switch or the VLAN.

show ipv6 mld snooping [**vlan** *vlan-id*]

Syntax Description	**vlan**	*vlan-id*	(Optional) Specify a VLAN; the range is 1 to 1001 and 1006 to 4094.

Command Modes

User EXEC

Privileged EXEC

Command History

Command History

Release	**Modification**
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

Use this command to display MLD snooping configuration for the switch or for a specific VLAN.

VLAN numbers 1002 through 1005 are reserved for Token Ring and FDDI VLANs and cannot be used in MLD snooping.

To configure the dual IPv4 and IPv6 template, enter the **sdm prefer dual-ipv4-and-ipv6** global configuration command and reload the switch.

Examples

This is an example of output from the show ipv6 mld snooping vlan command. It shows snooping characteristics for a specific VLAN.

```
Device# show ipv6 mld snooping vlan 100
Global MLD Snooping configuration:
-------------------------------------------
MLD snooping : Enabled
MLDv2 snooping (minimal) : Enabled
Listener message suppression : Enabled
TCN solicit query : Disabled
TCN flood query count : 2
Robustness variable : 3
Last listener query count : 2
Last listener query interval : 1000
Vlan 100:
--------
MLD snooping : Disabled
MLDv1 immediate leave : Disabled
Explicit host tracking : Enabled
Multicast router learning mode : pim-dvmrp
Robustness variable : 3
Last listener query count : 2
Last listener query interval : 1000
```

This is an example of output from the **show ipv6 mld snooping** command. It displays snooping characteristics for all VLANs on the switch.

```
Device# show ipv6 mld snooping
Global MLD Snooping configuration:
-------------------------------------------
MLD snooping : Enabled
MLDv2 snooping (minimal) : Enabled
Listener message suppression : Enabled
TCN solicit query : Disabled
TCN flood query count : 2
Robustness variable : 3
Last listener query count : 2
Last listener query interval : 1000

Vlan 1:
--------
MLD snooping : Disabled
MLDv1 immediate leave : Disabled
Explicit host tracking : Enabled
Multicast router learning mode : pim-dvmrp
Robustness variable : 1
Last listener query count : 2
Last listener query interval : 1000

<output truncated>

Vlan 951:
--------
MLD snooping : Disabled
MLDv1 immediate leave : Disabled
Explicit host tracking : Enabled
Multicast router learning mode : pim-dvmrp
Robustness variable : 3
Last listener query count : 2
Last listener query interval : 1000
```

show ipv6 mld snooping querier vlan

To see IPv6 MLD querier information in a VLAN, use the **show ipv6 mld snooping querier vlan** command.

show ipv6 mld snooping querier vlan *vlan-id*

Syntax Description

vlan-id	VLAN ID. Valid range is 1 to 1001 and 1006 to 4094.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the IPv6 MLD querier information in a VLAN whose ID is 3:

```
Device# show ipv6 mld snooping querier vlan 3
```

show ipv6 mld snooping wireless mgid

To see multicast group identifer (MGID) mapping information in the IPv6 MLD wireless related snooping events, use the **show ipv6 mld snooping wireless mgid** command.

show ipv6 mld snooping wireless mgid

Command Default	None
Command Modes	Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see multicast group identifer (MGID) mapping information in the IPv6 MLD wireless related snooping events:

```
Device# show ipv6 mld snooping wireless mgid
```

show ipv6 nd ra specific-route

To display information about IPv6 neighbor discovery router advertisement messages, use the **show ipv6 nd ra specific-route** command.

show ipv6 nd ra specific-route *interface*

Syntax Description	*interface* Interface information.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines   If you do not specify the interface, routes configured under all the interfaces are displayed.

Examples   The following example displays information about IPv6 neighbor discovery router advertisement messages:

```
Device# show ipv6 nd ra specific-route
```

show ldap attributes

To view information about the default LDAP attribute mapping, use the **show ldap attributes** command.

show ldap attributes

Syntax Description

This command has no arguments.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view information about the default LDAP attribute mapping:

```
Device# show ldap attributes
LDAP Attribute                     Format      AAA Attribute
==============                     ======      =============
airespaceBwDataBurstContract       Ulong       bsn-data-bandwidth-burst-contr
userPassword                       String      password
airespaceBwRealBurstContract       Ulong       bsn-realtime-bandwidth-burst-c
employeeType                       String      employee-type
airespaceServiceType               Ulong       service-type
airespaceACLName                   String      bsn-acl-name
priv-lvl                           Ulong       priv-lvl
memberOf                           String DN   supplicant-group
cn                                 String      username
airespaceDSCP                      Ulong       bsn-dscp
policyTag                          String      tag-name
airespaceQOSLevel                  Ulong       bsn-qos-level
airespace8021PType                 Ulong       bsn-8021p-type
airespaceBwRealAveContract         Ulong       bsn-realtime-bandwidth-average
airespaceVlanInterfaceName         String      bsn-vlan-interface-name
airespaceVapId                     Ulong       bsn-wlan-id
airespaceBwDataAveContract         Ulong       bsn-data-bandwidth-average-con
sAMAccountName                     String      sam-account-name
meetingContactInfo                 String      contact-info
telephoneNumber                    String      telephone-number
Map: att_map_1
department                         String DN   element-req-qos
```

show ldap server

To view the LDAP server information, use the **show ldap server** command.

show ldap server { *server-name* | **all** }

Syntax Description	*server-name*	Name of the server.
	all	Information of all the servers.

Command Default None

Command Modes Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the LDAP server information:

```
Device# show ldap server all
```

show license air entities

To display information about active APs, new APs, and deleted APs in connection with a Cisco Catalyst Wireless Controller, enter the **show license air entities** command in privileged EXEC mode.

show license air entities { **added** | **bulk** | **deleted** | **no-change** | **summary** }

Syntax Description

`added`	Displays the list of newly reported APs. A newly added AP is one that was not listed in the last RUM report that the product instance generated.
bulk	Displays the list of all currently active APs for the product instance
deleted	Displays the list of deleted APs. A delete AP is one that was listed as active APs in the last RUM report that the product instance generated but is now disconnected.
no-change	Displays the list of APs where there has been no change in the status since the last report.
summary	Displays the RUM report generation particulars and information about active APs, new APs, and deleted APs, and indicates by when an acknowledgement (ACK) must be installed on the product instance.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
Cisco IOS XE Amsterdam 17.3.2a	Command output was updated to display information relating to Smart Licensing Using Policy.
Cisco IOS XE Cupertino 17.7.1	The output of the **show license air entities summary** command was enhanced to display the following new field only on a Cisco Catalyst 9800-CL Wireless Controller: `License Ack expected within`

Usage Guidelines   **Smart Licensing**: If the software version on the device is Cisco IOS XE Amsterdam 17.3.1 or an earlier release, command output displays fields pertinent to Smart Licensing.

Smart Licensing Using Policy: If the software version on the device is Cisco IOS XE Amsterdam 17.3.2 or a later release, command output displays fields pertinent to Smart Licensing Using Policy.

Examples   For information about fields shown in the display for the **show license air entities summary** command, see .

For sample output, see

-

-

Table 16: show license air entities summary Field Descriptions

Field	Description
Last license report time	When the last RUM report was generated, in the local time zone.
Upcoming license report time	When the next RUM report will be generated, in the local time zone.
No. of APs active at last report	Total number of APs listed as active APs in the last RUM report that was generated.
No. of APs newly added with last report	Number of new APs in the last RUM report that was generated. For example, if the number displayed here is 2, this means the *last but one* RUM report did not list these 2 APs, and are therefore newly added in the last RUM report that the product instance generated.
No. of APs deleted with last report	Total number of APs deleted as of the last RUM report that was generated. For example, if the number displayed here is 2, this means 2 APs were in the *last but one* RUM report, but were deleted in the *last* RUM report was generated.
License Ack expected within	**Note** This field is displayed only on a Cisco Catalyst 9800-CL Wireless Controller running Cisco IOS XE Cupertino 17.7.1 or a later release. If the field is displayed, it means you must complete RUM reporting and ensure that the ACK is made available on the product instance - at least once.

show license air entities summary on a Cisco Catalyst 9800-CL Wireless Controller

This example shows how to identify when an ACK is required on a Cisco Catalyst 9800-CL Wireless Controller

Beginning with Cisco IOS XE Cupertino 17.7.1, if you are using a Cisco Catalyst 9800-CL Wireless Controller, you must complete RUM reporting and ensure that the ACK is made available on the product instance - at least once. This is to ensure that correct and up-to-date usage information is reflected in CSSM.

Prior to 17.7.1, reporting and ACK installation was not *mandatory* for a Cisco Catalyst 9800-CL Wireless Controller.

The following is sample output on a Cisco Catalyst 9800-CL Wireless Controller, where an ACK must be made available on the product instance within 179 days. If this deadline is not met, currently active APs are not disconnected, but no new AP joins are allowed after the ACK deadline is passed. System messages are also displayed daily, until the first ACK is installed.

```
Device# show license air entities summary
Upcoming license report time....................: 21:05:16.092 UTC Mon Oct 25 2021
No. of APs active at last report................: 57
No. of APs newly added with last report.........: 57
No. of APs deleted with last report.............: 0
License Ack expected within.....................: 179 days
```

Detailed information about this requirement is available in the configuration guide. In the Cisco Catalyst 9800 Series Wireless Controller Software Configuration Guide, version Cisco IOS XE Cupertino 17.7.1 onwards, see the *System Configuration → Smart Licensing Using Policy → RUM Reporting and Acknowledgment Requirement for Cisco Catalyst 9800-CL Wireless Controller*.

show license air entities summary on a Cisco Catalyst 9800-L Wireless Controller

The following is sample output on a Cisco Catalyst 9800-L Wireless Controller. Note how the output on this device does not display the `License Ack expected within` field. Reporting requirements on all Cisco Catalyst Wireless Controllers (except Cisco Catalyst 9800-CL Wireless Controller) are as per the standard guidelines in the Smart Licensing Using Policy environment: Reporting is required if the policy (**show license status**) or system messages indicate that it is.

```
Device# show license air entities summary
Upcoming license report time....................: 15:13:27.403 IST Tue Oct 26 2021
No. of APs active at last report................: 1
No. of APs newly added with last report.........: 1
No. of APs deleted with last report.............: 0
```

show license all

To display all licensing information enter the **show license all** command in Privileged EXEC mode. This command displays status, authorization, UDI, and usage information, all combined.

show license all

Syntax Description	This command has no keywords or arguments
Command Modes	Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
Cisco IOS XE Amsterdam 17.3.2a	Command output was updated to display information relating to Smart Licensing Using Policy.
	Command output no longer displays Smart Account and Virtual account information.
Cisco IOS XE Cupertino 17.7.1	The output of the command was enhanced to display the following information:
	• RUM report statistics, in section `Usage Report Summary`.
	• Smart Account and Virtual Account information, in section `Account Information`.

Usage Guidelines

Smart Licensing: If the software version on the device is Cisco IOS XE Amsterdam 17.3.1 or an earlier release, command output displays fields pertinent to Smart Licensing.

Smart Licensing Using Policy: If the software version on the device (also referred to as a product instance) is Cisco IOS XE Amsterdam 17.3.2 or a later release, command output displays fields pertinent to Smart Licensing Using Policy.

This command concatenates the output of other **show license** commands, enabling you to display different kinds of licensing information together. For field descriptions, refer to the corresponding commands in the links provided below.

The `Smart Licensing Status` and `Account Information` sections of the **show license all** command corresponds with the output of the show license status, on page 1238 command.

The `License Usage` section of the **show license all** command corresponds with the output of the show license usage, on page 1267 command.

The `Product Information` section of the **show license all** command corresponds with the output of the show license udi, on page 1266 command.

The `Agent Version` section of the **show license all** command displays the Smart Agent version and is available only in this command.

The `License Authorizations` section of the **show license all** command corresponds with the output of the show license authorization, on page 1223 command.

The `Usage Report Summary` section of the **show license all** command corresponds with the output in the command.

Examples

For sample output, see:

Example: show license all (Cisco Catalyst 9800-CL Wireless Controllers, 17.7.1)

The following is sample output of the **show license all** command, on a product instance where the software version is Cisco IOS XE Cupertino 17.7.1. Note the addition of the two new sections in this release: `Account Information` and `Usage Report Summary`:

```
Device# show license all

Smart Licensing Status
======================

Smart Licensing is ENABLED

Export Authorization Key:
  Features Authorized:
    <none>

Utility:
  Status: DISABLED

Smart Licensing Using Policy:
  Status: ENABLED

Account Information:
  Smart Account: Eg-SA
  Virtual Account: Eg-VA

Data Privacy:
  Sending Hostname: yes
    Callhome hostname privacy: DISABLED
    Smart Licensing hostname privacy: DISABLED
  Version privacy: DISABLED

Transport:
  Type: Smart
  URL: https://smartreceiver.cisco.com/licservice/license
  Proxy:
    Not Configured
  VRF:
    Not Configured

Miscellaneous:
  Custom Id: <empty>

Policy:
  Policy in use: Merged from multiple sources.
  Reporting ACK required: yes (CISCO default)
  Unenforced/Non-Export Perpetual Attributes:
    First report requirement (days): 365 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 90 (CISCO default)
```

```
    Unenforced/Non-Export Subscription Attributes:
      First report requirement (days): 90 (CISCO default)
      Reporting frequency (days): 90 (CISCO default)
      Report on change (days): 90 (CISCO default)
    Enforced (Perpetual/Subscription) License Attributes:
      First report requirement (days): 0 (CISCO default)
      Reporting frequency (days): 0 (CISCO default)
      Report on change (days): 0 (CISCO default)
    Export (Perpetual/Subscription) License Attributes:
      First report requirement (days): 0 (CISCO default)
      Reporting frequency (days): 0 (CISCO default)
      Report on change (days): 0 (CISCO default)

Usage Reporting:
  Last ACK received: <none>
  Next ACK deadline: <none>
  Reporting push interval: 0 (no reporting)
  Next ACK push check: <none>
  Next report push: <none>
  Last report push: <none>
  Last report file write: <none>

Trust Code Installed: <none>

License Usage
=============

No licenses in use

Product Information
===================
UDI: PID:C9800-CL-K9,SN:9KGIXIDOXFE

HA UDI List:
    Active:PID:C9800-CL-K9,SN:9KGIXIDOXFE
    Standby:PID:C9800-CL-K9,SN:9UBKZU955E4

Agent Version
=============
Smart Agent for Licensing: 5.3.14_rel/47

License Authorizations
======================
Overall status:
  Active: PID:C9800-CL-K9,SN:9KGIXIDOXFE
      Status: NOT INSTALLED
  Standby: PID:C9800-CL-K9,SN:9UBKZU955E4
      Status: NOT INSTALLED

Purchased Licenses:
  No Purchase Information Available

Usage Report Summary:
=====================
Total: 0,  Purged: 0
Total Acknowledged Received: 0,  Waiting for Ack: 0
Available to Report: 0  Collecting Data: 0
```

Example: show license all (Cisco Catalyst 9800-CL Wireless Controllers)

The following is sample output of the **show license all** command on a Cisco Catalyst 9800-CL
Wireless Controller. Similar output is displayed on all supported Cisco Catalyst Wireless Controllers.

```
Device# show license all

Smart Licensing Status
======================

Smart Licensing is ENABLED
License Reservation is ENABLED

Export Authorization Key:
  Features Authorized:
    <none>

Utility:
  Status: DISABLED

Smart Licensing Using Policy:
  Status: ENABLED

Data Privacy:
  Sending Hostname: yes
    Callhome hostname privacy: DISABLED
    Smart Licensing hostname privacy: DISABLED
  Version privacy: DISABLED

Transport:
  Type: Transport Off

Miscellaneous:
  Custom Id: <empty>

Policy:
  Policy in use: Merged from multiple sources.
  Reporting ACK required: yes (CISCO default)
  Unenforced/Non-Export Perpetual Attributes:
    First report requirement (days): 365 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 90 (CISCO default)
  Unenforced/Non-Export Subscription Attributes:
    First report requirement (days): 90 (CISCO default)
    Reporting frequency (days): 90 (CISCO default)
    Report on change (days): 90 (CISCO default)
  Enforced (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 0 (CISCO default)
  Export (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 0 (CISCO default)

Usage Reporting:
  Last ACK received: <none>
  Next ACK deadline: <none>
  Reporting push interval: 0 (no reporting)
  Next ACK push check: Nov 01 20:31:46 2020 IST
  Next report push: <none>
  Last report push: <none>
  Last report file write: <none>

Trust Code Installed: <none>

License Usage
=============
```

```
air-network-advantage (DNA_NWStack):
  Description: air-network-advantage
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: air-network-advantage
  Feature Description: air-network-advantage
  Enforcement type: NOT ENFORCED
  License type: Perpetual
  Reservation:
    Reservation status: SPECIFIC INSTALLED
    Total reserved count: 20

air-dna-advantage (AIR-DNA-A):
  Description: air-dna-advantage
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: air-dna-advantage
  Feature Description: air-dna-advantage
  Enforcement type: NOT ENFORCED
  License type: Perpetual
  Reservation:
    Reservation status: SPECIFIC INSTALLED
    Total reserved count: 20

Product Information
===================
UDI: PID:C9800-CL-K9,SN:93BBAH93MGS

HA UDI List:
    Active:PID:C9800-CL-K9,SN:93BBAH93MGS
    Standby:PID:C9800-CL-K9,SN:9XECPSUU4XN

Agent Version
=============
Smart Agent for Licensing: 5.0.6_rel/47

License Authorizations
======================
Overall status:
  Active: PID:C9800-CL-K9,SN:93BBAH93MGS
      Status: SPECIFIC INSTALLED on Nov 02 03:16:01 2020 IST
      Last Confirmation code: 102fc949
  Standby: PID:C9800-CL-K9,SN:9XECPSUU4XN
      Status: SPECIFIC INSTALLED on Nov 02 03:15:45 2020 IST
      Last Confirmation code: ad4382fe

Specified license reservations:
  Aironet DNA Advantage Term Licenses (AIR-DNA-A):
    Description: DNA Advantage for Wireless
    Total reserved count: 20
    Enforcement type: NOT ENFORCED
    Term information:
      Active: PID:C9800-CL-K9,SN:93BBAH93MGS
        Authorization type: SPECIFIC INSTALLED on Nov 02 03:15:45 2020 IST
        License type: TERM
          Start Date: 2020-OCT-14 UTC
          End Date: 2021-APR-12 UTC
          Term Count: 5
        Authorization type: SPECIFIC INSTALLED on Nov 02 03:15:45 2020 IST
        License type: TERM
```

```
                        Start Date: 2020-JUN-18 UTC
                        End Date: 2020-DEC-15 UTC
                        Term Count: 5
                Standby: PID:C9800-CL-K9,SN:9XECPSUU4XN
                  Authorization type: SPECIFIC INSTALLED on Nov 02 03:15:45 2020 IST
                  License type: TERM
                        Start Date: 2020-OCT-14 UTC
                        End Date: 2021-APR-12 UTC
                        Term Count: 10
      AP Perpetual Networkstack Advantage (DNA_NWStack):
        Description: AP Perpetual Network Stack entitled with DNA-A
        Total reserved count: 20
        Enforcement type: NOT ENFORCED
        Term information:
          Active: PID:C9800-CL-K9,SN:93BBAH93MGS
            Authorization type: SPECIFIC INSTALLED on Nov 02 03:15:45 2020 IST
            License type: TERM
                Start Date: 2020-OCT-14 UTC
                End Date: 2021-APR-12 UTC
                Term Count: 5
            Authorization type: SPECIFIC INSTALLED on Nov 02 03:15:45 2020 IST
            License type: TERM
                Start Date: 2020-JUN-18 UTC
                End Date: 2020-DEC-15 UTC
                Term Count: 5
          Standby: PID:C9800-CL-K9,SN:9XECPSUU4XN
            Authorization type: SPECIFIC INSTALLED on Nov 02 03:15:45 2020 IST
            License type: TERM
                Start Date: 2020-OCT-14 UTC
                End Date: 2021-APR-12 UTC
                Term Count: 10

  Purchased Licenses:
    No Purchase Information Available
```

show license authorization

To display authorization-related information for (export-controlled and enforced) licenses, enter the **show license authorization** command in privileged EXEC mode.

show license authorization

Syntax Description	This command has no keywords or arguments
Command Modes	Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.2a	This command was introduced.

Usage Guidelines

Only export-controlled or enforced licenses require authorization before use.

While there are no export-controlled or enforced licenses on Cisco Catalyst Wireless Controllers, you can use this command to display migrated SLR authorization codes.

Examples

See Table 17: show license authorization Field Descriptions, on page 1224 for information about fields shown in the display.

See show license authorization Displaying Migrated Authorization Code, on page 1226 for sample output.

Table 17: show license authorization Field Descriptions

Field		Description
Overall Status		Header for UDI information for all product instances in the set-up, the type of authorization that is installed, and configuration errors, if any. In a High Availability set-up, all UDIs in the set-up are listed.
	Active: Status:	The active product instance UDI, followed by the status of the authorization code installation for this UDI. If the status indicates that the authorization code is installed and there is a confirmation code, this is also displayed.
	Standby: Status:	The standby product instance UDI, followed by the status of the authorization code installation for this UDI. If the status indicates that the authorization code is installed and there is a confirmation code, this is also displayed.
	Member: Status:	The member product instance UDI, followed by the status of the authorization code installation for this UDI. If the status indicates that the authorization code is installed and there is a confirmation code, this is also displayed.
	ERROR:	Configuration errors or discrepancies in the High Availability set-up, if any.

Field	Description	
Authorizations	Header for detailed license authorization information. All licenses, their enforcement types, and validity durations are displayed. Errors are displayed for each product instance if its authorization or mode does not match what is installed on the active. This section is displayed only if the product instance is using a license with an authorization code.	
	():	License name and a shortened form of the license name.
	Description	License description.
	Total available count:	Total count of licenses that are available to consume. This includes licenses of all durations (perpetual and subscription), including expired subscription licenses, for all the product instances in a High Availability setup.
	Enforcement type	Enforcement type for the license. This may be one of the following: • Enforced • Not enforced • Export-Controlled
	Term information:	

Field		Description
		Header providing license duration information. The following fields maybe included under this header: - Active: The active product instance UDI, followed by the status of the authorization code installation for this UDI. - Authorization type: Type of authorization code installed and date of installation. The type can be: SLAC, UNIVERSAL, SPECIFIED, PAK, RTU. - Start Date: Displays validity start date if the license is for a specific term or time period. - Start Date: Displays validity end date if the license is for a specific term or time period. - Term Count: License count. - Subscription ID: Displays ID if the license is for a specific term or time period. - License type: License duration. This can be: SUBSCRIPTION or PERPETUAL. - Standby: The standby product instance UDI, followed by the status of the authorization code installation for this UDI. - Member: The member product instance UDI, followed by the status of the authorization code installation for this UDI. For more information about the duration or term of a license's validity, see \<link tbd\>.
Purchased Licenses	Header for license purchase information.	
	Active:	The active product instance and its the UDI.
	Count:	License count.
	Description:	License description.
	License type:	License duration. This can be: SUBSCRIPTION or PERPETUAL.
	Standby:	The standby product instance UDI.
	Member:	The member product instance UDI.

show license authorization Displaying Migrated Authorization Code

The following is sample output of the **show license authorization** command on a Cisco Catalyst 9800-CL Wireless Controller. The `Last Confirmation code:` shows that SLR authorization code is available after migration. Similar output is displayed on all supported Cisco Catalyst Wireless Controllers.

```
Device# show license authorization
Overall status:
  Active: PID:C9800-CL-K9,SN:93BBAH93MGS
      Status: SPECIFIC INSTALLED on Nov 02 03:16:01 2020 IST
      Last Confirmation code: 102fc949
  Standby: PID:C9800-CL-K9,SN:9XECPSUU4XN
      Status: SPECIFIC INSTALLED on Nov 02 03:15:45 2020 IST
      Last Confirmation code: ad4382fe

Specified license reservations:
  Aironet DNA Advantage Term Licenses (AIR-DNA-A):
    Description: DNA Advantage for Wireless
    Total reserved count: 20
    Enforcement type: NOT ENFORCED
    Term information:
      Active: PID:C9800-CL-K9,SN:93BBAH93MGS
        Authorization type: SPECIFIC INSTALLED on Nov 02 03:15:45 2020 IST
        License type: TERM
          Start Date: 2020-OCT-14 UTC
          End Date: 2021-APR-12 UTC
          Term Count: 5
        Authorization type: SPECIFIC INSTALLED on Nov 02 03:15:45 2020 IST
        License type: TERM
          Start Date: 2020-JUN-18 UTC
          End Date: 2020-DEC-15 UTC
          Term Count: 5
      Standby: PID:C9800-CL-K9,SN:9XECPSUU4XN
        Authorization type: SPECIFIC INSTALLED on Nov 02 03:15:45 2020 IST
        License type: TERM
          Start Date: 2020-OCT-14 UTC
          End Date: 2021-APR-12 UTC
          Term Count: 10
  AP Perpetual Networkstack Advantage (DNA_NWStack):
    Description: AP Perpetual Network Stack entitled with DNA-A
    Total reserved count: 20
    Enforcement type: NOT ENFORCED
    Term information:
      Active: PID:C9800-CL-K9,SN:93BBAH93MGS
        Authorization type: SPECIFIC INSTALLED on Nov 02 03:15:45 2020 IST
        License type: TERM
          Start Date: 2020-OCT-14 UTC
          End Date: 2021-APR-12 UTC
          Term Count: 5
        Authorization type: SPECIFIC INSTALLED on Nov 02 03:15:45 2020 IST
        License type: TERM
          Start Date: 2020-JUN-18 UTC
          End Date: 2020-DEC-15 UTC
          Term Count: 5
      Standby: PID:C9800-CL-K9,SN:9XECPSUU4XN
        Authorization type: SPECIFIC INSTALLED on Nov 02 03:15:45 2020 IST
        License type: TERM
          Start Date: 2020-OCT-14 UTC
          End Date: 2021-APR-12 UTC
          Term Count: 10

Purchased Licenses:
  No Purchase Information Available
```

show license data conversion

To display license data conversion information, enter the **show license data** command in privileged EXEC mode.

show license data   conversion

Syntax Description

This command has no keywords or arguments

Command Modes

Privileged EXEC (Device#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
Cisco IOS XE Amsterdam 17.3.2a	This command continues to be available with the introduction of Smart Licensing Using Policy.

Usage Guidelines

Although visible on the CLI, this command is not applicable to Cisco Catalyst Wireless Controllers.

show license eventlog

To display event logs relating to Smart Licensing Using Policy, enter the **show license eventlog** command in privileged EXEC mode.

show license eventlog   [*days*]

| Syntax Description | *days* | Enter the number of days for which you want to display event logs. The valid value range is from 0 to 2147483647. |

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
Cisco IOS XE Amsterdam 17.3.2a	Additional events were added with the introduction of Smart Licensing Using Policy: • Installation and removal of a policy • Request, installation and removal of an authorization code. • Installation and removal of a trust code. • Addition of authorization source information for license usage.

Usage Guidelines   **Smart Licensing Using Policy**: If the software version on the device (also referred to as a product instance) is Cisco IOS XE Amsterdam 17.3.2a or a later release, command output displays fields pertinent to Smart Licensing Using Policy.

Smart Licensing: If the software version on the device is Cisco IOS XE Amsterdam 17.3.1 or an earlier release, command output displays fields pertinent to Smart Licensing.

show license history message

To display communication history between the product instance and CSSM or CSLU (as the case may be), enter the **show license history message** command in privileged EXEC mode. The output of this command is used by the technical support team, for troubleshooting.

show license history message

Syntax Description   This command has no keywords or arguments.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.2a	This command was introduced.

Usage Guidelines   When you encounter an error message that you are not able to resolve, along with a copy of the message that appears on the console or in the system log, provide your Cisco technical support representative with sample output of these commands: **show license tech support**, **show license history message**, and the **show platform software sl-infra** privileged EXEC commands.

show license reservation

To display license reservation information, enter the **show license reservation** command in privileged EXEC mode.

show license reservation

Syntax Description

This command has no keywords or arguments

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
Cisco IOS XE Amsterdam 17.3.2a	This command continues to be available with the introduction of Smart Licensing Using Policy.

Usage Guidelines

The command continues to be available on the CLI and corresponding output is displayed, but with the introduction of Smart Licensing Using Policy, the notion of reservation is not longer applicable. Use the **show license all** command in privileged EXEC mode, to display *migrated* SLR licenses instead (the SLR authorization code is migrated to Smart Licensing Using Policy).

show license rum

To display information about Resource Utilization Measurement reports (RUM report) available on the product instance, including report IDs, the current processing state of a report, error information (if any), and to save the detailed or summarized view that is displayed, enter the **show license rum** command in privileged EXEC mode.

show license rum { **feature** { *license_name* | **all** } | **id** { *rum_id* | **all** } } [**detail**] [**save** *path*]

Syntax Description		
feature { *license_name*	**all** }	Displays RUM report information based on the license name.	
	Specify a particular license name to display all RUM reports for that license, or use the **all** keyword to display all RUM reports available on the product instance.	
id { *rum_id*	**all** }	Displays RUM report information based on the RUM report ID.	
	Specify a report ID to display information for a single report, or use the **all** keyword to display all RUM reports available on the product instance.	
detail	Displays detailed RUM report information.	
	You can use this to display detailed information by license name and detailed information by RUM report ID.	
save *path*	Saves the information that is displayed. This can be the simplified or detailed version and depends on the preceeding keywords you have entered.	
	Information about 200 RUM reports can be displayed. If there are more 200 RUM reports on the product instance, you can view information about all the RUM reports by saving it to a text (.txt) file.	
	Note	This option saves the information *about* RUM reports and is not for reporting purposes. It does not save the RUM report, which is an XML file containing usage information.

Command Modes   Privileged EXEC (Device#)

Command History	Release	Modification
	Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Usage Guidelines   A RUM report is a license usage report, which the product instance generates, to fulfil reporting requirements as specified by the policy. An acknowledgement (ACK) is a response from CSSM and provides information about the status of a RUM report. Once the ACK for a report is available on the product instance, it indicates

that the corresponding RUM report is no longer required and can be deleted. You can use the **show license rum** command to:

- Display information about the available RUM reports on the product instance - filtered by ID or license name.

- Display a short summary of the information or display a detailed view of the information.

- Track a RUM report throughout its lifecycle (from the time it is first generated until its acknowledgement from CSSM). By displaying the current processing state and condition of a report you can ascertain if and when there is a problem in the reporting workflow.

- Save the displayed information. The CLI displays information about up to 200 reports. If there are more than 200 reports on the product instance and you want to view information about all of them, save the displayed info in a .txt file and export to the desired location to view.

To display a statistical view of RUM report information (the total number of reports on the product instance, the number of reports that have a corresponding ACK, the number of reports waiting for an ACK etc.) refer to the `Usage Report Summary:` section of the **show license all** and **show license tech** privileged EXEC commands.

The **show license tech** command also provides RUM report related information that the Cisco technical support team can use to troubleshoot, if there are problems with RUM reporting.

Examples

For information about fields shown in the display, see #unique_1003 unique_1003_Connect_42_table_ytd_q4m_hrb and #unique_1003 unique_1003_Connect_42_table_gtn_q4m_hrb

For sample output of the **show license rum** command, see:

- #unique_1003 unique_1003_Connect_42_example_ugm_lsd_4rb

- #unique_1003 unique_1003_Connect_42_example_stg_msd_4rb

Table 18: show license rum (simplified view) Field Descriptions

Field Name	Description
Report Id	A numeric field that identifies a RUM report. The product instance automatically assigns an ID to every RUM report it generates. An ID may be up to 20 characters long.

Field Name	Description
State	This field displays the current processing state of a RUM report, and can be only one of the following: • OPEN: This means new measurements are been added into this report. • CLOSED: This means no new measurements can be added to this report, and the report is ready for communication to CSSM. • PENDING: This is a transitional status that you may see if you display a report while it is being transmitted. • UNACK: This means the report was transmitted and is waiting for confirmation from CSSM, that it is processed. • ACK: This means the report was processed or acknowledged by CSSM and is eligible for deletion.

Flag	Indicates the condition of the RUM report, and is displayed in the form of a character. Each character represents a specific condition, and can be only one of the following values:
	
	• N: Normal; This means no errors have been detected and the report is going through normal operation.
	
	• P: Purged; This means the report was removed due to system resource limitation, and can refer to a shortage of disk space or insufficient memory. If this flag is displayed, refer to the State Change Reason field in the detailed view for more information.
	
	• E: Error; This means an error was detected in the RUM report. If this flag is displayed, refer to the detailed view for more information. Possible workflow issues include and are not limited to the following:
	
	  • RUM report was dropped by CSSM. If this is the issue, the State field displays value ACK, but the State Change Reason does not change to ACKED.
	
	  • RUM Report data is missing. If this is the issue, the Storage State field displays value MISSING.
	
	  • Tracking information is missing. If this is the case the State field displays value UNACK and the Transaction ID field has no information.
	
	Note Occasional errors in RUM reports do not require any action from you and are not an indication of a problem. It is only if you see a large number of reports (greater than 10) with errors that you must contact the Cisco technical support team.

Feature Name	The name of the license that the RUM report applies to.

Table 19: show license rum (detailed view) Field Descriptions

Field Name	Description
Report Id	A numeric field that identifies a RUM report. The product instance automatically assigns an ID to every RUM report it generates. An ID may be up to 20 characters long.
Metric Name:	Shows the type of data that is recorded. For a RUM report, the only possible value is ENTITLEMENT, and refers to measurement of license usage.
Feature Name:	The name of the license that the RUM report applies to.
Metric Value	A unique identifier for the data that is recorded. This is the same as the "Entitlement Tag" in the output of the **show license tech** command and it displays information about the license being tracked.
UDI	Composed of the Product ID (PID) and serial number of the product instance.
Previous Report Id:	ID of the previous RUM report that the product instance generated for a license.
Next Report Id:	The ID that the product instance will use for the next RUM report it generates for a llicense.
State:	Displays the current processing state of a RUM report. The value displayed here is always the same as the value displayed in the simplified view. For the list of possible values see #unique_1003 unique_1003_Connect_42_table_ytd_q4m_hrbabove.
State Change Reason:	Displays the reason for a RUM report state change. Not all state changes provide a reason. • NONE: This means the RUM report is going through its normal lifecycle (for instance, from OPEN → CLOSED → ACK). This state change reason is usually accompanied by an N flag (meaning Normal) in the simplified view and requires no action from you. • ACKED: RUM report was processed normally by CSSM. • REMOVED: RUM report was received and requested to be removed by CSSM. • RELOAD: RUM report state was changed due to some type of device reload.
Start Time:	Timestamps for measurement start and measurement end for a RUM report.
End Time:	Together, the start time and end time provide the time duration that the measurements cover.

Field Name	Description
Storage State:	Displays current storage state of the RUM report and can be one of the following values: • EXIST: This means the data for the RUM report is located in storage. • DELETED: This means the data was intentionally deleted. Refer to the `Storage State Change Reason` in the output of the **show license tech** command for more information about this storage state. • PURGED: This means the data was deleted due to a system resource limitation. Refer to the `Storage State Change Reason` in the output of the **show license tech** command for more information about this storage state. • MISSING: This means data is missing from storage. If reports are identified as missing, there is no recovery process.
Transaction ID: Transaction Message:	Contains tracking information for the RUM report. This information can be either polling information or ACK import information. The Transaction Message contains the error message, if the product instance receives one when importing an ACK. The information in these fields is used by the Cisco technical support team when troubleshooting problems with RUM reports.

Example: show license rum feature: Simplified and Detailed View

The following is sample output of the **show license rum feature***license-name* and **show license rum feature***license-name***detail** commands on a Cisco Catalyst 9500 Series Switch. Similar output is displayed on all other Catalyst switches.

The output is filtered to display all RUM reports for the DNA Advantage license, followed by a detailed view of all RUM reports for the DNA Advantage license.

```
Device# show license rum feature air-dna-advantage

Smart Licensing Usage Report:

==================================

Report Id,        State,    Flag, Feature Name

1638055644        CLOSED    N     air-dna-advantage

1638055646        OPEN      N     air-dna-advantage


Device# show license rum feature air-dna-advantage detail
Smart Licensing Usage Report Detail:
==================================
Report Id: 1638055644
  Metric Name: ENTITLEMENT
  Feature Name: air-dna-advantage
  Metric Value: regid.2017-08.com.cisco.AIR-DNA-A,1.0_b6308627-3ab0-4a11-a3d9-586911a0d790
  UDI: PID:C9800-CL-K9,SN:93SZ7RXN93Y
  Previous Report Id: 0,    Next Report Id: 1638055646
```

```
    State: CLOSED,      State Change Reason: RELOAD
    Start Time: Nov 28 12:02:09 2021 UTC,      End Time: Nov 30 22:02:13 2021 UTC
    Storage State: EXIST
    Transaction ID: 0
    Transaction Message: <none>

Report Id: 1638055646
  Metric Name: ENTITLEMENT
  Feature Name: air-dna-advantage
  Metric Value: regid.2017-08.com.cisco.AIR-DNA-A,1.0_b6308627-3ab0-4a11-a3d9-586911a0d790
  UDI: PID:C9800-CL-K9,SN:93SZ7RXN93Y
  Previous Report Id: 1638055644,    Next Report Id: 0
  State: OPEN,      State Change Reason: None
  Start Time: Nov 30 23:12:56 2021 UTC,      End Time: Dec 01 02:12:56 2021 UTC
  Storage State: EXIST
  Transaction ID: 0
  Transaction Message: <none>
```

Example: Saving a RUM Report View

The following example shows you how to save the information that is displayed.

By using the **feature** and **all** keywords, the output is filtered to display all RUM reports for all licenses being used on the product instance. It is then transferred it to a TFTP location, from where it can opened, to view the information.

```
Device# show license rum feature all save bootflash:all-rum-stats.txt
Device# copy tftp://10.8.0.6/bootflash:all-rum-stats.txt
```

show license status

To display information about licensing settings such as data privacy, policy, transport, usage reporting and trust codes, enter the **show license status** command in privileged EXEC mode.

show license status

Syntax Description

This command has no keywords or arguments

Command Modes

Privileged EXEC (Device#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
Cisco IOS XE Amsterdam 17.3.2a	Command output was updated to reflect new fields that are applicable to Smart Licensing Using Policy. This includes `Trust code installed:`, `Policy in use`, `Policy name:`, reporting requirements as in the policy (`Attributes:`), and fields related to usage reporting.
	Command output no longer displays Smart Account and Virtual account information.
Cisco IOS XE Cupertino 17.7.1	Command output was updated to display Smart Account and Virtual account information.

Usage Guidelines

Smart Licensing: If the software version on the device is Cisco IOS XE Amsterdam 17.3.1 or an earlier release, command output displays fields pertinent to Smart Licensing.

Smart Licensing Using Policy: If the software version on the device (also referred to as a product instance) is Cisco IOS XE Amsterdam 17.3.2a or a later release, command output displays fields pertinent to Smart Licensing Using Policy.

Account Information in the output

Starting with Cisco IOS XE Cupertino 17.7.1, every ACK includes the Smart Account and Virtual Account that was reported to, in CSSM. When it receives the ACK, the product instance securely stores only the latest version of this information - as determined by the timestamp in the ACK. The Smart Account and Virtual Account information that is displayed in the `Account Information` section of this command's output is therefore always as per the latest available ACK on the product instance.

If a product instance is moved from one Smart Account and Virtual Account to another, the next ACK after the move will have this updated information. The output of this command is updated once this ACK is available on the product instance.

The ACK may be received directly (where the product instance is connected to CSSM), or indirectly (where the product instance is connect to CSSM through CSLU, Cisco DNA Center, or SSM On-Prem), or by manually importing the ACK (where a product instance is in an air-gapped network).

Examples

For information about the fields shown in the display, see Table 20: show license status Field Descriptions for Smart Licensing Using Policy, on page 1239 .

For sample output, see:

- show license status with Account Information (Smart Licensing Using Policy), on page 1244

- show license status with Cisco Default Policy (Smart Licensing Using Policy), on page 1245

- show license status with Custom Policy (Smart Licensing Using Policy), on page 1246

Table 20: show license status Field Descriptions for Smart Licensing Using Policy

Field	Description	
Utility	Header for utility settings that are configured on the product instance.	
	Status:	Status
	Utility report:	Last attempt:
	Customer Information:	The following fields are displayed: • Id: • Name: • Street • City: • State: • Country: • Postal Code:
Smart Licensing Using Policy:	Header for policy settings on the product instance.	
	Status:	Indicates if Smart Licensing Using Policy is enabled. Smart Licensing Using Policy is supported starting from Cisco IOS XE Amsterdam 17.3.2 and is always enabled on supported software images.

Field		Description
Account Information:		Header for account information that the product instance belongs to, in CSSM.
		This section is displayed only if the software version on the product instance is Cisco IOS XE Cupertino 17.7.1 or a later release.
	Smart Account:	The Smart Account that the product instance is part of. This information is always as per the latest available ACK on the product instance.
	Virtual Account:	The Virtual Account that the product instance is part of. This information is always as per the latest available ACK on the product instance.
Data Privacy:		Header for privacy settings that are configured on the product instance.
	Sending Hostname:	A *yes* or *no* value which shows if the hostname is sent in usage reports.
	Callhome hostname privacy:	Indicates if the Call Home feature is configured as the mode of transport for reporting. If configured, one of these values is displayed: • ENABLED • DISABLED
	Smart Licensing hostname privacy:	One of these values is displayed: • ENABLED • DISABLED
	Version privacy:	One of these values is displayed: • ENABLED • DISABLED
Transport:		Header for transport settings that are configured on the product instance.
	Type:	Mode of transport that is in use.
		Additional fields are displayed for certain transport modes. For example, if transport type is set to CSLU, the CSLU address is also displayed.

Field		Description
Policy:		Header for policy information that is applicable to the product instance.
	Policy in use:	Policy that is applied
		This can be one of the following: Cisco default, Product default, Permanent License Reservation, Specific License Reservation, PAK license, Installed on <date>, Controller.
	Policy name:	Name of the policy
	Reporting ACK required:	A *yes* or *no* value which specifies if the report for this product instance requires CSSM acknowledgement (ACK) or not. The default policy is always set to "yes".
	Unenforced/Non-Export Perpetual Attributes	Displays policy values for perpetual licenses. • First report requirement (days): The maximum amount of time available before the first report must be sent, followed by policy name. • Reporting frequency (days): The maximum amount of time available before the subsequent report must be sent, followed by policy name. • Report on change (days): he maximum amount of time available to send a report in case of a change in license usage, followed by policy name
	Unenforced/Non-Export Subscription Attributes	Displays policy values for subscription licenses. • First report requirement (days): The maximum amount of time available before the first report must be sent, followed by policy name. • Reporting frequency (days): The maximum amount of time available before the subsequent report must be sent, followed by policy name. • Report on change (days): he maximum amount of time available to send a report in case of a change in license usage, followed by policy name
	Enforced (Perpetual/Subscription) License Attributes	

Field		Description
		Displays policy values for enforced licenses. • First report requirement (days): The maximum amount of time available before the first report must be sent, followed by policy name. • Reporting frequency (days): The maximum amount of time available before the subsequent report must be sent, followed by policy name. • Report on change (days): The maximum amount of time available to send a report in case of a change in license usage, followed by policy name
	Export (Perpetual/Subscription) License Attributes	Displays policy values for export-controlled licenses. • First report requirement (days): The maximum amount of time available before the first report must be sent, followed by policy name. • Reporting frequency (days): The maximum amount of time available before the subsequent report must be sent, followed by policy name. • Report on change (days): The maximum amount of time available to send a report in case of a change in license usage, followed by policy name
Miscellaneous	Header for custom ID.	
	Custom Id:	ID

Field	Description	
Usage Reporting:	Header for usage reporting (RUM reports) information.	
	Last ACK received:	Date and time of last ACK received, in the local time zone.
	Next ACK deadline:	Date and time for next ACK. If the policy states that an ACK is not requires then this field displays `none`. **Note** If an ACK is required and is not received by this deadline, a syslog is displayed.
	Reporting Interval:	Reporting interval in days The value displayed here depends on what you configure in the **license smart usage interval***interval_in_days* and the policy value. For more information, see the corresponding Syntax Description: license smart (global config), on page 541.
	Next ACK push check:	Date and time when the product instance will submit the next polling request for an ACK. Date and time are in the local time zone. This applies only to product instance- initiated communication to CSSM or CSLU. If the reporting interval is zero, or if no ACK polling is pending, then this field displays `none`.
	Next report push:	Date and time when the product instance will send the next RUM report. Date and time are in the local time zone. If the reporting interval is zero, or if there are no pending RUM reports, then this field displays `none`.
	Last report push:	Date and time for when the product instance sent the last RUM report. Date and time are in the local time zone.
	Last report file write:	Date and time for when the product instance last saved an offline RUM report. Date and time are in the local time zone.
	Last report pull:	Date and time for when usage reporting information was retrieved using data models. Date and time are in the local time zone.

Field		Description
Trust Code Installed:		Header for trust code-related information. Displays date and time if trust code is installed. Date and time are in the local time zone. If a trust code is not installed, then this field displays `none`.
	Active:	Active product instance. In a High Availability set-up, the the UDIs of all product instances in the set-up, along with corresponding trust code installation dates and times are displayed.
	Standby:	Standby product instance.
	Member:	Member product instance

show license status with Account Information (Smart Licensing Using Policy)

The following is sample output of the **show license status** command, on a product instance where the software version is Cisco IOS XE Cupertino 17.7.1:

```
Device# show license status
Utility:
  Status: DISABLED

Smart Licensing Using Policy:
  Status: ENABLED

Account Information:
  Smart Account: Eg-SA
  Virtual Account: Eg-VA

Data Privacy:
  Sending Hostname: yes
    Callhome hostname privacy: DISABLED
    Smart Licensing hostname privacy: DISABLED
  Version privacy: DISABLED

Transport:
  Type: Smart
  URL: https://smartreceiver.cisco.com/licservice/license
  Proxy:
    Not Configured
  VRF:
    Not Configured

Policy:
  Policy in use: Merged from multiple sources.
  Reporting ACK required: yes (CISCO default)
  Unenforced/Non-Export Perpetual Attributes:
    First report requirement (days): 365 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 90 (CISCO default)
  Unenforced/Non-Export Subscription Attributes:
    First report requirement (days): 90 (CISCO default)
    Reporting frequency (days): 90 (CISCO default)
    Report on change (days): 90 (CISCO default)
  Enforced (Perpetual/Subscription) License Attributes:
```

```
      First report requirement (days): 0 (CISCO default)
      Reporting frequency (days): 0 (CISCO default)
      Report on change (days): 0 (CISCO default)
    Export (Perpetual/Subscription) License Attributes:
      First report requirement (days): 0 (CISCO default)
      Reporting frequency (days): 0 (CISCO default)
      Report on change (days): 0 (CISCO default)

Miscellaneous:
  Custom Id: <empty>

Usage Reporting:
  Last ACK received: <none>
  Next ACK deadline: <none>
  Reporting push interval: 0 (no reporting)
  Next ACK push check: <none>
  Next report push: <none>
  Last report push: <none>
  Last report file write: <none>

Trust Code Installed: <none>
```

show license status with Cisco Default Policy (Smart Licensing Using Policy)

The following is sample output of the **show license status** command; a default is policy applied here.

```
Device# show license status

Utility:
  Status: DISABLED

Smart Licensing Using Policy:
  Status: ENABLED

Data Privacy:
  Sending Hostname: yes
    Callhome hostname privacy: DISABLED
    Smart Licensing hostname privacy: DISABLED
  Version privacy: DISABLED

Transport:
  Type: Smart
  URL: https://smartreceiver.cisco.com/licservice/license
  Proxy:
    Not Configured

Policy:
  Policy in use: Merged from multiple sources.
  Reporting ACK required: yes (CISCO default)
  Unenforced/Non-Export Perpetual Attributes:
    First report requirement (days): 365 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 90 (CISCO default)
  Unenforced/Non-Export Subscription Attributes:
    First report requirement (days): 90 (CISCO default)
    Reporting frequency (days): 90 (CISCO default)
    Report on change (days): 90 (CISCO default)
  Enforced (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 0 (CISCO default)
  Export (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
```

```
      Report on change (days): 0 (CISCO default)

Miscellaneous:
  Custom Id: <empty>

Usage Reporting:
  Last ACK received: <none>
  Next ACK deadline: <none>
  Reporting push interval: 0 (no reporting)
  Next ACK push check: <none>
  Next report push: <none>
  Last report push: <none>
  Last report file write: <none>

Trust Code Installed: <none>
```

show license status with Custom Policy (Smart Licensing Using Policy)

The following is sample output of the **show license status** command; a custom policy applied here.

```
Device# show license status
Utility:
  Status: DISABLED

Smart Licensing Using Policy:
  Status: ENABLED

Data Privacy:
  Sending Hostname: yes
    Callhome hostname privacy: DISABLED
    Smart Licensing hostname privacy: DISABLED
  Version privacy: DISABLED

Transport:
  Type: Smart
  URL: https://smartreceiver.cisco.com/licservice/license
  Proxy:
    Not Configured

Policy:
  Policy in use: Installed On Nov 02 05:09:31 2020 IST
  Policy name: SLE Policy
  Reporting ACK required: yes (Customer Policy)
  Unenforced/Non-Export Perpetual Attributes:
    First report requirement (days): 60 (Customer Policy)
    Reporting frequency (days): 60 (Customer Policy)
    Report on change (days): 60 (Customer Policy)
  Unenforced/Non-Export Subscription Attributes:
    First report requirement (days): 30 (Customer Policy)
    Reporting frequency (days): 30 (Customer Policy)
    Report on change (days): 30 (Customer Policy)
  Enforced (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 90 (Customer Policy)
    Report on change (days): 90 (Customer Policy)
  Export (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 90 (Customer Policy)
    Report on change (days): 90 (Customer Policy)

Miscellaneous:
  Custom Id: <empty>
```

```
Usage Reporting:
  Last ACK received: <none>
  Next ACK deadline: <none>
  Reporting push interval: 0 (no reporting)
  Next ACK push check: <none>
  Next report push: <none>
  Last report push: <none>
  Last report file write: <none>

Trust Code Installed:
  Active: PID:C9800-CL-K9,SN:93BBAH93MGS
    INSTALLED on Nov 02 05:09:31 2020 IST
  Standby: PID:C9800-CL-K9,SN:9XECPSUU4XN
    INSTALLED on Nov 02 05:09:31 2020 IST
```

show license summary

To display a brief summary of license usage, which includes information about licenses being used, the count, and status, enter the **show license summary** command in privileged EXEC mode.

show license summary

Syntax Description
This command has no keywords or arguments

Command Modes
Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
Cisco IOS XE Amsterdam 17.3.2a	Command output was updated to reflect valid license status for Smart Licensing Using Policy. Valid license statuses include: IN USE, NOT IN USE, NOT AUTHORIZED.
	Command output was also updated to remove registration and authorization information.
	Command output no longer displays Smart Account and Virtual account information.
Cisco IOS XE Cupertino 17.7.1	Command output was updated to display Smart Account and Virtual account information.

Usage Guidelines
Smart Licensing: If the software version on the device is Cisco IOS XE Amsterdam 17.3.1 or an earlier release, command output displays fields pertinent to Smart Licensing.

Smart Licensing Using Policy: If the software version on the device (also referred to as a product instance) is Cisco IOS XE Amsterdam 17.3.2a or a later release, command output displays fields pertinent to Smart Licensing Using Policy.

The licenses on Cisco Catalyst Wireless Controllers are never NOT AUTHORIZED, because none of the available licenses are export-controlled or enforced (Only these licenses require authorization before use).

Account Information in the output

Starting with Cisco IOS XE Cupertino 17.7.1, every ACK includes the Smart Account and Virtual Account that was reported to, in CSSM. When it receives the ACK, the product instance securely stores only the latest version of this information - as determined by the timestamp in the ACK. The Smart Account and Virtual Account information that is displayed in the Account Information section of this command's output is therefore always as per the latest available ACK on the product instance.

If a product instance is moved from one Smart Account and Virtual Account to another, the next ACK after the move will have this updated information. The output of this command is updated once this ACK is available on the product instance.

The ACK may be received directly (where the product instance is connected to CSSM), or indirectly (where the product instance is connect to CSSM through CSLU, Cisco DNA Center, or SSM On-Prem), or by manually importing the ACK (where a product instance is in an air-gapped network).

Examples

See Table 21: show license summary Field Descriptions, on page 1249 for information about fields shown in the display.

show license summary: IN USE (Smart Licensing Using Policy), on page 1249

show license summary: NOT IN USE (Smart Licensing Using Policy), on page 1249

Table 21: show license summary Field Descriptions

Field	Description
Account Information: Smart Account: Virtual Account:	The Smart Account and Virtual Account that the product instance is part of. This information is always as per the latest available ACK on the product instance. This field is displayed only if the software version on the product instance is Cisco IOS XE Cupertino 17.7.1 or a later release.
License	Name of the licenses in use
Entitlement Tag	Short name for license
Count	License count
Status	License status can be one of the following • In-Use: Valid license, and in-use. • Not In-Use • Not Authorized: Means that the license requires installation of SLAC before use.

show license summary: IN USE (Smart Licensing Using Policy)

The following is sample output of the **show license summary** command, on a product instance where the software version is Cisco IOS XE Cupertino 17.7.1:

```
Devide# show license summary

Account Information:
  Smart Account: Eg-SA
  Virtual Account: Eg-VA

License Usage:
  License                Entitlement Tag                 Count Status
  -----------------------------------------------------------------------------
  air-network-essentials  (DNA_NWSTACK_E)                     1 IN USE
  air-dna-essentials     (AIR-DNA-E)                          1 IN USE
```

show license summary: NOT IN USE (Smart Licensing Using Policy)

The following is sample output of the **show license summary** command, where no APs have joined the controller. Current consumption (Count) is therefore zero, and the `Status` field shows that the licenses are `NOT IN USE`:

```
Device# show license summary

Device#show license summary
License Reservation is ENABLED

License Usage:
  License                    Entitlement Tag              Count Status
  ----------------------------------------------------------------------
  Aironet DNA Advantag... (AIR-DNA-A)                     0 NOT IN USE
  AP Perpetual Network... (DNA_NWStack)                   0 NOT IN USE
```

show license tech

To display licensing information to help the technical support team to solve a problem, enter the **show license tech** command in privileged EXEC mode. The output for this command includes outputs of several other **show license** commands and more.

show license tech { **message** | **rum** { **feature** { *license_name* | **all** } | **id** { *rum_id* | **all** } } [**detail**] [**save** *path*] | **support** }

Syntax Description	**message**	Displays messages concerning trust establishment, usage reporting, result polling, authorization code requests and returns, and trust synchronization.
		This is the same information as displayed in the output of the **show license history message** command.
	rum { **feature** { *license_name*	**all** }	**id** { *rum_id*	**all** } } [**detail**] [**save** *path*]	Displays information about Resource Utilization Measurement reports (RUM reports) on the product instance, including report IDs, the current processing state of a report, error information (if any), and an option save the displayed RUM report information.
		Note This option saves the information *about* RUM reports and is not for reporting purposes. It does not save the RUM report, which is an XML file containing usage information.
	support	Displays licensing information that helps the technical support team to debug a problem.

Command Modes	Privileged EXEC

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
	Cisco IOS XE Amsterdam 17.3.2a	Command output was updated to reflect new fields that are applicable to Smart Licensing Using Policy.

Release	Modification
Cisco IOS XE Cupertino 17.7.1	The **rum** keyword and additional options under this keyword were added: { **feature** { *license_name* | **all** } | **id** { *rum_id* | **all** } } The output of the **show license tech support** command was enhanced to display the following information: • RUM report information, in section `License Usage` and `Usage Report Summary`. • Smart Account and Virtual account information, in section `Account Information:`. The **data conversion**, **eventlog** and **reservation** keywords were removed from this command. They continuite to be available as separate show commands, that is, **show license data**, **show license eventlog**, and **show license reservation** respectively.

Usage Guidelines

Smart Licensing: If the software version on the device is Cisco IOS XE Amsterdam 17.3.1 or an earlier release, command output displays fields pertinent to Smart Licensing (whether smart licensing is enabled, all associated licensing certificates, compliance status, and so on).

Smart Licensing Using Policy: If the software version on the device (also referred to as a product instance) is Cisco IOS XE Amsterdam 17.3.2 or a later release, command output displays fields pertinent to Smart Licensing Using Policy. Note the following guidelines:

• Troubleshooting with a Support Representative

When you encounter an error message that you are not able to resolve, along with a copy of the message that appears on the console or in the system log, provide your Cisco technical support representative with sample output of these commands: **show license tech support**, **show license history message**, and the **show platform software sl-infra all** privileged EXEC commands.

• RUM Report Information in the output

• The output of the **show license tech support** command displays the following sections pertaining to RUM reports:

```
<output truncated>
License Usage
=============
  Measurements:
    ENTITLEMENT:
      Interval: 00:15:00
      Current Value: 800
      Current Report: 1638055645      Previous: 0
 <output truncated>
```

```
<output truncated>
Usage Report Summary:
=====================
Total: 4,  Purged: 0(0)
```

```
     Total Acknowledged Received: 0,   Waiting for Ack: 0(4)
     Available to Report: 4  Collecting Data: 2
     Maximum Display: 4  In Storage: 4,  MIA: 0(0)
     Report Module Status: Ready

     <output truncated>
```

- The output of the **show license tech rum** command when used with the **detail** keyword, displays the following fields pertaining to RUM reports: Table 24: show license tech rum: Field Descriptions for Header "Smart Licensing Usage Report Detail", on page 1254.

  The options available under the **show license tech rum** keyword are the same as the options available with the **show license rum** privileged EXEC command. The sample output that is displayed in the *simplified view* is also the same. But if you use the **detail** keyword (for example if you enter **show license tech rum feature** *license_name* **detail**), the detailed view is displayed and this has a few *additional* fields when compared to **show license rum**.

```
<output truncated>
Smart Licensing Usage Report Detail:
===================================
Report Id: 1638055644
  Metric Name: ENTITLEMENT
  Feature Name: air-dna-advantage
  Metric Value:
regid.2017-08.com.cisco.AIR-DNA-A,1.0_b6308627-3ab0-4a11-a3d9-586911a0d790
  UDI: PID:C9800-CL-K9,SN:93SZ7RXN93Y
  Previous Report Id: 0,    Next Report Id: 1638055646
  Version: 2.0
  State: CLOSED,      State Change Reason: RELOAD
  Start Time: Nov 28 12:02:09 2021 UTC,      End Time: Nov 30 22:02:13 2021 UTC
  Storage State: EXIST,  Storage State Change Reason: None
  Transaction ID: 0
  Transaction Message: <none>
  Report Size: 54880(54987)
<output truncated>
```

Table 22: show license tech support: Field Descriptions for Header "License Usage"

Field Name	Description
Interval:	This is a fixed measurement duration and is always 15 minutes.
Current Value:	Information about the current license count.
Current Report:	ID of the currently OPEN report for the license.
Previous:	ID of the last OPEN report for the license. This report will have state CLOSED now.

Table 23: show license tech support: Field Descriptions for Header "Usage Report Summary"

Field Name	Description
Total:	Total number of reports that the product instance has ever generated. **Note** This total does not refer to the total number of reports *currently available* on and being tracked by the product instance. For this you must sum up the `Total Acknowledged Received:` and `Available to Report` fields.
Purged:	The number of reports deleted due to a system resource limitation. This number includes RUM reports where the product instance no longer has tracking information.
Total Acknowledged Received:	The number of RUM reports acknowledged on this product instance.
Waiting for Ack:	The number of RUM reports waiting for an ACK. This is the total number of reports in an `UNACK` state, where the product instance still has tracking information.
Available to Report:	The number of RUM reports that are available to send to CSSM. This is the total number of reports in an `OPEN` or `CLOSED` state, where the product instance still has tracking information.
Collecting Data:	Number of reports where the product instance is currently collecting measurements.
Maximum Display:	Number of reports available for display in a **show** command's output.
In Storage:	Number of reports currently stored on the disk
MIA:	The number of reports missing.

Table 24: show license tech rum: Field Descriptions for Header "Smart Licensing Usage Report Detail"

Field Name	Description
Version:	Displays the format of the report during transmission. Starting with Cisco IOS XE Cupertino 17.7.1, RUM reports are stored in a new format that reduces processing time. This field indicates if the product instance is using the old format or the new format.

Field Name	Description
Storage State:	Indicates if a given report is currently in storage.
	In addition to the displaying the current storage state of the RUM report, with these possible values: EXIST, DELETED, PURGED, MISSING, if a "(1)" is displayed next to the label (`Storage State (1)`), this means the RUM report is in the older (pre-17.7.1 format) and will be processed accordingly. If the RUM report is in the new format, the field is displayed as `Storage State` - without any extra information.
Storage State Change Reason:	Displays the reason for the change in the storage state change. Not all state changes provide a reason.
	• NONE: This means no reason was recorded for the the storage state change.
	• PROCESSED: This means the RUM report was deleted after CISCO has processed the data.
	• LIMIT_STORAGE: This means the RUM report was deleted because the product instance reached it's storage limit.
	• LIMIT_TIME: This means the RUM report was deleted because the report reached the persisted time limit.
Transaction ID: Transaction Message:	If the transaction ID displays a correlation ID and an error status is displayed, the product instance displays the error code field in this section. If there are no errors, no data is displayed here.
Report Size	This field displays two numbers. The first number is the size of raw report for communication, in bytes. The second number is the disk space used for saving the report, also in bytes. The second number is displayed only if report is stored in the new format.

show license tech support on Cisco Catalyst 9800-CL Wireless Controller

The following is sample output from the **show license tech support** command on a Cisco Catalyst 98000-CL Wireless Controller running software version Cisco IOS XE Cupertino 17.7.1:

```
Device# show license tech support
Smart Licensing Tech Support info

Smart Licensing Status
======================

Smart Licensing is ENABLED

Export Authorization Key:
  Features Authorized:
    <none>

Utility:
  Status: DISABLED
```

```
            Smart Licensing Using Policy:
              Status: ENABLED

            Account Information:
              Smart Account: <none>
              Virtual Account: <none>

            Data Privacy:
              Sending Hostname: yes
                Callhome hostname privacy: DISABLED
                Smart Licensing hostname privacy: DISABLED
              Version privacy: DISABLED

            Transport:
              Type: Smart
              URL: https://smartreceiver.cisco.com/licservice/license
              Proxy:
                Address: <empty>
                Port: <empty>
                Username: <empty>
                Password: <empty>
              Server Identity Check: True
              VRF: <empty>

            Miscellaneous:
              Custom Id: <empty>

            Policy:
              Policy in use: Merged from multiple sources.
              Reporting ACK required: yes (CISCO default)
              Unenforced/Non-Export Perpetual Attributes:
                First report requirement (days): 365 (CISCO default)
                Reporting frequency (days): 0 (CISCO default)
                Report on change (days): 90 (CISCO default)
              Unenforced/Non-Export Subscription Attributes:
                First report requirement (days): 90 (CISCO default)
                Reporting frequency (days): 90 (CISCO default)
                Report on change (days): 90 (CISCO default)
              Enforced (Perpetual/Subscription) License Attributes:
                First report requirement (days): 0 (CISCO default)
                Reporting frequency (days): 0 (CISCO default)
                Report on change (days): 0 (CISCO default)
              Export (Perpetual/Subscription) License Attributes:
                First report requirement (days): 0 (CISCO default)
                Reporting frequency (days): 0 (CISCO default)
                Report on change (days): 0 (CISCO default)

            Usage Reporting:
              Last ACK received: <none>
              Next ACK deadline: <none>
              Reporting push interval: 0 (no reporting) State(1) InPolicy(0)
              Next ACK push check: <none>
              Next report push: <none>
              Last report push: <none>
              Last report file write: <none>

            License Usage
            =============
            Handle: 1
              License: air-network-advantage
              Entitlement Tag:
            regid.2018-06.com.cisco.DNA_NWStack,1.0_e7244e71-3ad5-4608-8bf0-d12f67c80896
              Description: air-network-advantage
              Count: 0
```

```
  Version: 1.0
  Status: NOT IN USE(1)
  Status time: Oct 05 22:24:24 2021 UTC
  Request Time: None
  Export status: NOT RESTRICTED
  Feature Name: air-network-advantage
  Feature Description: air-network-advantage
  Enforcement type: NOT ENFORCED
  License type: Perpetual
  Measurements:
    ENTITLEMENT:
      Interval: 00:15:00
      Current Value: 0
      Current Report: 0       Previous: 0
  Soft Enforced: True

Handle: 2
  License: air-dna-advantage
  Entitlement Tag: regid.2017-08.com.cisco.AIR-DNA-A,1.0_b6308627-3ab0-4a11-a3d9-586911a0d790

  Description: air-dna-advantage
  Count: 0
  Version: 1.0
  Status: NOT IN USE(1)
  Status time: Oct 05 22:24:24 2021 UTC
  Request Time: None
  Export status: NOT RESTRICTED
  Feature Name: air-dna-advantage
  Feature Description: air-dna-advantage
  Enforcement type: NOT ENFORCED
  License type: Subscription
  Measurements:
    ENTITLEMENT:
      Interval: 00:15:00
      Current Value: 0
      Current Report: 0       Previous: 0
  Soft Enforced: True

Product Information
===================
UDI: PID:C9800-CL-K9,SN:9KGIXIDOXFE

HA UDI List:
    Active:PID:C9800-CL-K9,SN:9KGIXIDOXFE
    Standby:PID:C9800-CL-K9,SN:9UBKZU955E4

Agent Version
=============
Smart Agent for Licensing: 5.3.14_rel/47

Upcoming Scheduled Jobs
=======================
Current time: Oct 06 00:38:46 2021 UTC
Daily: Oct 06 21:24:22 2021 UTC (20 hours, 45 minutes, 36 seconds remaining)
Authorization Renewal: Expired Not Rescheduled
Init Flag Check: Expired Not Rescheduled
Reservation configuration mismatch between nodes in HA mode: Expired Not Rescheduled
Start Utility Measurements: Oct 06 00:39:25 2021 UTC (39 seconds remaining)
Send Utility RUM reports: Oct 06 22:24:54 2021 UTC (21 hours, 46 minutes, 8 seconds remaining)
Save unreported RUM Reports: Oct 06 01:24:35 2021 UTC (45 minutes, 49 seconds remaining)
Data Synchronization: Expired Not Rescheduled
External Event: Expired Not Rescheduled
Operational Model: Expired Not Rescheduled
```

```
Communication Statistics:
=======================
Communication Level Allowed: INDIRECT
Overall State: Insufficient trust for direct communication
Trust Establishment:
  Attempts: Total=0, Success=0, Fail=0  Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
    Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>
Trust Acknowledgement:
  Attempts: Total=0, Success=0, Fail=0  Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
    Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>
Usage Reporting:
  Attempts: Total=0, Success=0, Fail=0  Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
    Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>
Result Polling:
  Attempts: Total=0, Success=0, Fail=0  Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
    Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>
Authorization Request:
  Attempts: Total=0, Success=0, Fail=0  Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
    Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>
Authorization Confirmation:
  Attempts: Total=0, Success=0, Fail=0  Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
    Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>
Authorization Return:
  Attempts: Total=0, Success=0, Fail=0  Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
    Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>
Trust Sync:
  Attempts: Total=0, Success=0, Fail=0  Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
    Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>
Hello Message:
  Attempts: Total=0, Success=0, Fail=0  Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
    Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>

License Certificates
===================
Production Cert: False
Not registered. No certificates installed
```

```
HA Info
==========
RP Role: Active
Chassis Role: Active
Behavior Role: Active
RMF: True
CF: True
CF State: Stateless
Message Flow Allowed: False

Reservation Info
================
License reservation: DISABLED

Overall status:
  Active: PID:C9800-CL-K9,SN:9KGIXIDOXFE
      Reservation status: NOT INSTALLED
      Request code: <none>
      Last return code: <none>
      Last Confirmation code: <none>
      Reservation authorization code: <none>
  Standby: PID:C9800-CL-K9,SN:9UBKZU955E4
      Reservation status: NOT INSTALLED
      Request code: <none>
      Last return code: <none>
      Last Confirmation code: <none>
      Reservation authorization code: <none>

Specified license reservations:

Purchased Licenses:
  No Purchase Information Available

Usage Report Summary:
=====================
Total: 0,  Purged: 0(0)
Total Acknowledged Received: 0,  Waiting for Ack: 0(0)
Available to Report: 0  Collecting Data: 0
Maximum Display: 0  In Storage: 0,  MIA: 0(0)
Report Module Status: Ready

Other Info
==========
Software ID: regid.2018-05.com.cisco.WLC_9500C,1.0_85665885-b865-4e32-8184-5510412fcb54
Agent State: authorized
TS enable: True
Transport: Smart
  Default URL: https://smartreceiver.cisco.com/licservice/license
Locale: en_US.UTF-8
Debug flags: 0x7
Privacy Send Hostname: True
Privacy Send IP: True
Build type:: Production
sizeof(char)  : 1
sizeof(int)   : 4
sizeof(long)  : 4
sizeof(char *): 8
sizeof(time_t): 4
sizeof(size_t): 8
Endian: Big
Write Erase Occurred: False
XOS version: 0.12.0.0
Config Persist Received: False
Message Version: 1.3
```

```
connect_info.name: <empty>
connect_info.version: <empty>
connect_info.additional: <empty>
connect_info.prod: False
connect_info.capabilities: <empty>
agent.capabilities: UTILITY, DLC, AppHA, MULTITIER, EXPORT_2, OK_TRY_AGAIN
Check Point Interface: True
Config Management Interface: False
License Map Interface: True
HA Interface: True
Trusted Store Interface: True
Platform Data Interface: True
Crypto Version 2 Interface: False
SAPluginMgmtInterfaceMutex: True
SAPluginMgmtIPDomainName: True
SmartTransportVRFSupport: True
SmartAgentClientWaitForServer: 2000
SmartAgentCmReTrySend: True
SmartAgentClientIsUnified: True
SmartAgentCmClient: True
SmartAgentClientName: UnifiedClient
builtInEncryption: True
enableOnInit: True
routingReadyByEvent: True
systemInitByEvent: True
SmartTransportServerIdCheck: True
SmartTransportProxySupport: True
SmartAgentPolicyDisplayFormat: 0
SmartAgentReportOnUpgrade: False
SmartAgentIndividualRUMEncrypt: 2
SmartAgentMaxRumMemory: 2
SmartAgentConcurrentThreadMax: 10
SmartAgentPolicyControllerModel: False
SmartAgentPolicyModel: True
SmartAgentFederalLicense: True
SmartAgentMultiTenant: False
attr365DayEvalSyslog: True
checkPointWriteOnly: False
SmartAgentDelayCertValidation: False
enableByDefault: False
conversionAutomatic: True
conversionAllowed: False
storageEncryptDisable: False
storageLoadUnencryptedDisable: False
TSPluginDisable: False
bypassUDICheck: False
loggingAddTStamp: False
loggingAddTid: True
HighAvailabilityOverrideEvent: UnknownPlatformEvent
platformIndependentOverrideEvent: UnknownPlatformEvent
platformOverrideEvent: UnknownPlatformEvent
WaitForHaRole: False
standbyIsHot: True
chkPtType: 2
delayCommInit: False
roleByEvent: True
maxTraceLength: 150
traceAlwaysOn: True
debugFlags: 0
Event log max size: 5120 KB
Event log current size: 3 KB
P:C9800-CL-K9,S:9KGIXIDOXFE: No Trust Data
P:C9800-CL-K9,S:9UBKZU955E4: No Trust Data
Overall Trust: No ID
```

```
Clock sync-ed with NTP: True

Platform Provided Mapping Table
==============================
  C9800-CL-K9: Total licenses found: 5
Enforced Licenses:
  P:C9800-CL-K9,S:9KGIXIDOXFE:
    No PD enforced licenses
  P:C9800-CL-K9,S:9UBKZU955E4:
    No PD enforced licenses
```

Example (Smart Licensing Using Policy)

The following is sample output from the **show license tech support** command.

```
Device# show license tech support

Smart Licensing Tech Support info

Smart Licensing Status
======================

Smart Licensing is ENABLED
License Reservation is ENABLED

Registration:
  Status: REGISTERED - SPECIFIC LICENSE RESERVATION
  Export-Controlled Functionality: ALLOWED
  Initial Registration: SUCCEEDED on Nov 02 03:16:01 2020 IST

License Authorization:
  Status: AUTHORIZED - RESERVED on Nov 02 03:16:01 2020 IST

Export Authorization Key:
  Features Authorized:
    <none>

Utility:
  Status: DISABLED

Data Privacy:
  Sending Hostname: yes
    Callhome hostname privacy: DISABLED
    Smart Licensing hostname privacy: DISABLED
  Version privacy: DISABLED

Transport:
  Type: Smart
  URL: https://smartreceiver.cisco.com/licservice/license

Evaluation Period:
  Evaluation Mode: Not In Use
  Evaluation Period Remaining: 89 days, 23 hours, 42 minutes, 47 seconds

License Usage
=============
Handle: 1
  License: AP Perpetual Networkstack Advantage
  Entitlement tag:
regid.2018-06.com.cisco.DNA_NWStack,1.0_e7244e71-3ad5-4608-8bf0-d12f67c80896
  Description: AP Perpetual Network Stack entitled with DNA-A
  Count: 1
  Version: 1.0
```

```
        Status: AUTHORIZED(3)
        Status time: Nov 02 03:16:01 2020 IST
        Request Time: Nov 02 02:55:34 2020 IST
        Export status: NOT RESTRICTED
        Soft Enforced: True

    Handle: 2
      License: Aironet DNA Advantage Term Licenses
      Entitlement tag: regid.2017-08.com.cisco.AIR-DNA-A,1.0_b6308627-3ab0-4a11-a3d9-586911a0d790

      Description: DNA Advantage for Wireless
      Count: 1
      Version: 1.0
      Status: AUTHORIZED(3)
      Status time: Nov 02 03:16:01 2020 IST
      Request Time: Nov 02 02:55:34 2020 IST
      Export status: NOT RESTRICTED
      Soft Enforced: True

Product Information
===================
UDI: PID:C9800-CL-K9,SN:93BBAH93MGS

HA UDI List:
    Active:PID:C9800-CL-K9,SN:93BBAH93MGS
    Standby:PID:C9800-CL-K9,SN:9XECPSUU4XN

Agent Version
=============
Smart Agent for Licensing: 4.8.7_rel/52

Upcoming Scheduled Jobs
=======================
Current time: Nov 02 03:17:23 2020 IST
Daily: Nov 03 02:47:04 2020 IST (23 hours, 29 minutes, 41 seconds remaining)
Certificate Renewal: Not Available
Certificate Expiration Check: Not Available
Authorization Renewal: Not Available
Authorization Expiration Check: Not Available
Init Flag Check: Not Available
Evaluation Expiration Check: Not Available
Ack Expiration Check: Not Available
Evaluation Expiration Warning: Not Available
IdCert Expiration Warning: Not Available
Reservation request in progress warning: Not Available
Reservation configuration mismatch between nodes in HA mode: Nov 09 03:16:30 2020 IST (6
days, 23 hours, 59 minutes, 7 seconds remaining)
Endpoint Report Request: Not Available

License Certificates
====================
Production Cert: True
Not registered. No certificates installed

HA Info
=======
RP Role: Active
Chassis Role: Active
Behavior Role: Active
RMF: True
CF: True
CF State: Stateless
Message Flow Allowed: False
```

```
Reservation Info
================
License reservation: ENABLED

Overall status:
  Active: PID:C9800-CL-K9,SN:93BBAH93MGS
      Reservation status: SPECIFIC INSTALLED on Nov 02 03:16:01 2020 IST
      Export-Controlled Functionality: ALLOWED
      Request code: <none>
      Last return code: <none>
      Last Confirmation code: 102fc949
      Reservation authorization code:
<specifiedReservationCodeXMLVersion="1.0"><specificPIDReservation><version>C</version><piid>0a1d1b41-577e-4421-979a-b1b91d9379f5</piid><timestamp>1604287313</timestamp><entitlements><entitlement><tag>regid.2017-08.com.cisco.AIR-DNA-A,1.0_b60827-3b04-411-a39-58911-0793</tag><count>5</count><startDate>2020-Oct-14
 UTC</startDate><endDate>2021-Apr-12
UTC</endDate><licenseType>TERM</licenseType><displayName>Aironet DNA Advantage Term
Licenses</displayName><tagDescription>DNA Advantage for
Wireless</tagDescription><subscriptionID></subscriptionID></entitlement><entitlement><tag>regid.2017-08.com.cisco.AIR-DNA-A,1.0_b60827-3b04-411-a39-58911-0793</tag><count>5</count><startDate>2020-Jun-18
 UTC</startDate><endDate>2020-Dec-15
UTC</endDate><licenseType>TERM</licenseType><displayName>Aironet DNA Advantage Term
Licenses</displayName><tagDescription>DNA Advantage for
Wireless</tagDescription><subscriptionID></subscriptionID></entitlement><entitlement><tag>regid.2018-06.com.cisco.DNA_NWStack,1.0_e72451-3d5-468-8d0-1d2578096</tag><count>5</count><startDate>2020-Oct-14
 UTC</startDate><endDate>2021-Apr-12
UTC</endDate><licenseType>TERM</licenseType><displayName>AP Perpetual Networkstack
Advantage</displayName><tagDescription>AP Perpetual Network Stack entitled with
DNA-A</tagDescription><subscriptionID></subscriptionID></entitlement><entitlement><tag>regid.2018-06.com.cisco.DNA_NWStack,1.0_e72451-3d5-468-8d0-1d2578096</tag><count>5</count><startDate>2020-Jun-18
 UTC</startDate><endDate>2020-Dec-15
UTC</endDate><licenseType>TERM</licenseType><displayName>AP Perpetual Networkstack
Advantage</displayName><tagDescription>AP Perpetual Network Stack entitled with
DNA-A</tagDescription><subscriptionID></subscriptionID></entitlement></entitlements><authorizationCode><signature>MEUCIAGTT4dF6lAYjgSX9X4TRg7HV5D3JXMRaWz2pQ=</signature><udi>P:C9800-CL-K9,S:93BBAH93MGS</udi></authorizationCode></specificPIDReservation>

  Standby: PID:C9800-CL-K9,SN:9XECPSUU4XN
      Reservation status: SPECIFIC INSTALLED on Nov 02 03:15:45 2020 IST
      Export-Controlled Functionality: ALLOWED
      Request code: <none>
      Last return code: <none>
      Last Confirmation code: ad4382fe
      Reservation authorization code:
<specifiedReservationCodeXMLVersion="1.0"><specificPIDReservation><version>C</version><piid>b021-5740-748056</piid><timestamp>1604287313</timestamp><entitlements><entitlement><tag>regid.2018-06.com.cisco.DNA_NWStack,1.0_72451-3d5-468-8d0-1d2578096</tag><count>10</count><startDate>2020-Oct-14
 UTC</startDate><endDate>2021-Apr-12
UTC</endDate><licenseType>TERM</licenseType><displayName>AP Perpetual Networkstack
Advantage</displayName><tagDescription>AP Perpetual Network Stack entitled with
DNA-A</tagDescription><subscriptionID></subscriptionID></entitlement><entitlement><tag>regid.2017-08.com.cisco.AIR-DNA-A,1.0_b60827-3b04-411-a39-58911-0793</tag><count>10</count><startDate>2020-Oct-14
 UTC</startDate><endDate>2021-Apr-12
UTC</endDate><licenseType>TERM</licenseType><displayName>Aironet DNA Advantage Term
Licenses</displayName><tagDescription>DNA Advantage for
Wireless</tagDescription><subscriptionID></subscriptionID></entitlement></entitlements><authorizationCode><signature>MEUCIAQTV4ku84/dv3ECQYfish4ANQ/BgTUJiNCy/&gt;IQpHQ=</signature><udi>P:C9800-CL-K9,S:9XECPSUU4XN</udi></authorizationCode></specificPIDReservation>

Specified license reservations:
  Aironet DNA Advantage Term Licenses (AIR-DNA-A):
    Description: DNA Advantage for Wireless
    Total reserved count: 20
    Term information:
      Active: PID:C9800-CL-K9,SN:93BBAH93MGS
        License type: TERM
          Start Date: 2020-OCT-14 UTC
          End Date: 2021-APR-12 UTC
          Term Count: 5
          Subscription ID: <none>
        License type: TERM
          Start Date: 2020-JUN-18 UTC
          End Date: 2020-DEC-15 UTC
          Term Count: 5
          Subscription ID: <none>
      Standby: PID:C9800-CL-K9,SN:9XECPSUU4XN
```

```
             License type: TERM
                Start Date: 2020-OCT-14 UTC
                End Date: 2021-APR-12 UTC
                Term Count: 10
                Subscription ID: <none>
    AP Perpetual Networkstack Advantage (DNA_NWStack):
      Description: AP Perpetual Network Stack entitled with DNA-A
      Total reserved count: 20
      Term information:
        Active: PID:C9800-CL-K9,SN:93BBAH93MGS
          License type: TERM
            Start Date: 2020-OCT-14 UTC
            End Date: 2021-APR-12 UTC
            Term Count: 5
            Subscription ID: <none>
          License type: TERM
            Start Date: 2020-JUN-18 UTC
            End Date: 2020-DEC-15 UTC
            Term Count: 5
            Subscription ID: <none>
        Standby: PID:C9800-CL-K9,SN:9XECPSUU4XN
          License type: TERM
            Start Date: 2020-OCT-14 UTC
            End Date: 2021-APR-12 UTC
            Term Count: 10
            Subscription ID: <none>

Other Info
==========
Software ID: regid.2018-05.com.cisco.WLC_9500C,1.0_85665885-b865-4e32-8184-5510412fcb54
Agent State: authorized
TS enable: True
Transport: Smart
  Default URL: https://smartreceiver.cisco.com/licservice/license
Locale: en_US.UTF-8
Debug flags: 0x7
Privacy Send Hostname: True
Privacy Send IP: True
Build type:: Production
sizeof(char)  : 1
sizeof(int)   : 4
sizeof(long)  : 4
sizeof(char *): 8
sizeof(time_t): 4
sizeof(size_t): 8
Endian: Big
Write Erase Occurred: False
XOS version: 0.12.0.0
Config Persist Received: False
Message Version: 1.3
connect_info.name: <empty>
connect_info.version: <empty>
connect_info.additional: <empty>
connect_info.prod: False
connect_info.capabilities: <empty>
agent.capabilities: UTILITY, DLC, AppHA, MULTITIER, EXPORT_2, OK_TRY_AGAIN
SmartAgentClientWaitForServer: 2000
SmartAgentCmReTrySend: True
SmartAgentClientIsUnified: True
SmartAgentCmClient: True
SmartAgentClientName: UnifiedClient
builtInEncryption: True
enableOnInit: True
routingReadyByEvent: True
```

```
systemInitByEvent: True
SmartAgentFederalLicense: True
SmartAgent_Crypto_Exit_CB: 0x55B353357A20
SmartAgent_Crypto_Start_CB: 0x55B353357A10
SmartAgentMultiTenant: False
attr365DayEvalSyslog: True
checkPointWriteOnly: False
SmartAgentDelayCertValidation: False
enableByDefault: False
conversionAutomatic: True
conversionAllowed: False
storageEncryptDisable: False
storageLoadUnencryptedDisable: False
TSPluginDisable: False
bypassUDICheck: False
loggingAddTStamp: False
loggingAddTid: True
platformOverrideEvent: UnknownPlatformEvent
WaitForHaRole: False
standbyIsHot: True
chkPtType: 2
delayCommInit: False
roleByEvent: True
maxTraceLength: 150
traceAlwaysOn: True
debugFlags: 0
Event log max size: 5120 KB
Event log current size: 21 KB

Platform Provided Mapping Table
===============================
<empty>
```

show license udi

To display Unique Device Identifier (UDI) information for a product instance, enter the **show license udi** command in privileged EXEC mode. In a High Availability set-up, the output displays UDI information for all connected product instances.

show license udi

Syntax Description   This command has no keywords or arguments

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
Cisco IOS XE Amsterdam 17.3.2a	This command continues to be available with the introduction of Smart Licensing Using Policy.

Usage Guidelines   **Smart Licensing Using Policy**: If the software version on the device (also referred to as a product instance) is Cisco IOS XE Amsterdam 17.3.2a or a later release, command output displays fields pertinent to Smart Licensing Using Policy.

Smart Licensing: If the software version on the device is Cisco IOS XE Amsterdam 17.3.1 or an earlier release, command output displays fields pertinent to Smart Licensing.

Examples

show license udi with Standalone Product Instance

The following is sample output from the **show license udi** command on a standalone product instance.

```
Device# show license udi

UDI: PID:C9800-L-F-K9,SN:FCW2323W016
```

show license udi with Active and Standby

The following is sample output from the **show license udi** command in a High Availability set-up where an active and a standby product instances exist. UDI information is displayed for both.

```
Device# show license udi

UDI: PID:C9800-CL-K9,SN:93BBAH93MGS

HA UDI List:
    Active:PID:C9800-CL-K9,SN:93BBAH93MGS
    Standby:PID:C9800-CL-K9,SN:9XECPSUU4XN
```

show license usage

To display license usage information such as status, a count of licenses being used, and enforcement type, enter the **show license usage** command in privileged EXEC mode.

show license usage

Syntax Description	This command has no keywords or arguments

Command Modes	Privileged EXEC

Command History

Release	Modification
This command was introduced in a release earlier than Cisco IOS XE Amsterdam 17.3.2	This command was introduced.
Cisco IOS XE Amsterdam 17.3.2a	Command output was updated to reflect new fields that are applicable to Smart Licensing Using Policy. This includes the `Status, Enforcement type` fields.
	Command output was also updated to remove reservation related information, authorization status information, and export status information.

Usage Guidelines   **Smart Licensing Using Policy**: If the software version on the device (also referred to as a product instance) is Cisco IOS XE Amsterdam 17.3.2a or a later release, command output displays fields pertinent to Smart Licensing Using Policy.

Smart Licensing: If the software version on the device is Cisco IOS XE Amsterdam 17.3.1 or an earlier release, command output displays fields pertinent to Smart Licensing.

Examples

See Table 25: show license usage Field Descriptions, on page 1267 for information about fields shown in the display.

show license usage with unenforced licenses (Smart Licensing Using Policy), on page 1268

show license usage with unenforced SLR licenses (Smart Licensing Using Policy), on page 1269

Table 25: show license usage Field Descriptions

Field	Description
License Authorization: Status:	Displays overall authorization status.
():	Name of the license as in CSSM. If this license is one that requires an authorization code, the name of th the code.

Field	Description
Description	Description of the license as in CSSM.
Count	License count. If the license is not in-use, the count is reflected as zero.
Version	Version.
Status	License status can be one of the following • In-Use: Valid license, and in-use. • Not In-Use • Not Authorized: Means that the license requires installation of SLA more information, see
Export Status:	Indicates if this license is export-controlled or not. Accordingly, one of the is displayed: • RESTRICTED - ALLOWED • RESTRICTED - NOT ALLOWED • NOT RESTRICTED
Feature name	Name of the feature that uses this license.
Feature Description:	Description of the feature that uses this license.
Utility Subscription id:	ID Not applicable, because the corresponding confiuration option is not sup
Enforcement type	Enforcement type status for the license. This may be one of the followin • ENFORCED • NOT ENFORCED • EXPORT RESTRICTED - ALLOWED • EXPORT RESTRICTED - NOT ALLOWED For more information about enforcement types, see <link tbd>

show license usage with unenforced licenses (Smart Licensing Using Policy)

The following is sample output of the **show license usage** command. Unenforced licenses are in-use here.

```
Device# show license usage

License Authorization:
  Status: Not Applicable

air-network-essentials (DNA_NWSTACK_E):
  Description: air-network-essentials
  Count: 1
  Version: 1.0
```

```
Status: IN USE
Export status: NOT RESTRICTED
Feature Name: air-network-essentials
Feature Description: air-network-essentials
Enforcement type: NOT ENFORCED
License type: Perpetual

air-dna-essentials (AIR-DNA-E):
  Description: air-dna-essentials
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: air-dna-essentials
  Feature Description: air-dna-essentials
  Enforcement type: NOT ENFORCED
  License type: Perpetual
```

show license usage with unenforced SLR licenses (Smart Licensing Using Policy)

The following is sample output of the **show license usage** command. Migrated SLR licenses are in-use here:

```
Device# show license usage

air-network-advantage (DNA_NWStack):
  Description: air-network-advantage
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: air-network-advantage
  Feature Description: air-network-advantage
  Enforcement type: NOT ENFORCED
  License type: Perpetual
  Reservation:
    Reservation status: SPECIFIC INSTALLED
    Total reserved count: 20

air-dna-advantage (AIR-DNA-A):
  Description: air-dna-advantage
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: air-dna-advantage
  Feature Description: air-dna-advantage
  Enforcement type: NOT ENFORCED
  License type: Perpetual
  Reservation:
    Reservation status: SPECIFIC INSTALLED
    Total reserved count: 20
```

show platform software rif-mgr chassis active R0 resource-status

To verify the Redundancy Port Interface (RIF) resource status in an active instance, use the **show platform software rif-mgr chassis active R0 resource-status** command.

show platform software rif-mgr chassis active R0 resource-status

Syntax Description

rif-mgr	Displays information about the RIF manager.
chassis	Displays information about the chassis.
active	Specifies the Active instance.
R0	Specifies the Route-Processor slot 0.
resource-status	Displays the resource status.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines   The RIF resource status displays the RP status, RMI status, Current Chassis State, and Peer Chassis State.

Example

The following example shows how to verify the RIF resource status in active instance:

```
Device# show platform software rif-mgr chassis active R0 resource-status
RIF Resource Status

    RP Status           : Up
    RMI Status          : Up
    Current Chassis State : Active
    Peer Chassis State  : Standby
```

show platform software rif-mgr chassis standby R0 resource-status

To verify the Redundancy Port Interface (RIF) resource status in a standby instance, use the **show platform software rif-mgr chassis standby R0 resource-status** command.

show platform software rif-mgr chassis standby R0 resource-status

Syntax Description

rif-mgr	Displays information about the RIF manager.
chassis	Displays information about the chassis.
standby	Specifies the Standby instance.
R0	Specifies the Route-Processor slot 0.
resource-status	Displays the resource status.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines   The RIF resource status displays the RP status, RMI status, Current Chassis State, and Peer Chassis State.

Example

The following example shows how to verify the RIF resource status in standby instance:

```
Device# show platform software rif-mgr chassis standby R0 resource-status
RIF Resource Status

    RP Status            : Up
    RMI Status           : Up
    Current Chassis State : Standby
    Peer Chassis State    : Active
```

show platform software rif-mgr chassis active R0 rmi-connection-details

To verify the RMI link re-establishment count and the time since it is Up or Down in an active instance, use the **show platform software rif-mgr chassis active R0 rmi-connection-details** command.

show platform software rif-mgr chassis active R0 rmi-connection-details

Syntax Description

rif-mgr	Displays information about the RIF manager.
chassis	Displays information about the chassis.
active	Specifies the Active instance.
R0	Specifies the Route-Processor slot 0.
rmi-connection-details	Displays the RMI connection details.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Examples

The following example shows how to verify the RMI link re-establishment count and the time since it is Up in an active instance:

```
Device# show platform software rif-mgr chassis active R0 rmi-connection-details
RMI Connection Details
    RMI Link re-establish count : 2
    RMI Link Uptime            : 21 hours 8 minutes 43 seconds
    RMI Link Upsince           : 08/05/2021 13:46:01
```

The following example shows how to verify the RMI link re-establishment count and the time since it is Down in an active instance:

```
Device# show platform software rif-mgr chassis active R0 rmi-connection-details
RMI Connection Details
    RMI Link re-establish count : 1
    RMI Link Downtime          : 28 seconds
    RMI Link Downsince         : 07/16/2021 03:19:11
```

show platform software rif-mgr chassis standby R0 rmi-connection-details

To verify the RMI link re-establishment count and the time since it is Up or Down in a standby instance, use the **show platform software rif-mgr chassis standby R0 rmi-connection-details** command.

show platform software rif-mgr chassis standby R0 rmi-connection-details

Syntax Description		
	rif-mgr	Displays information about the RIF manager.
	chassis	Displays information about the chassis.
	standby	Specifies the Standby instance.
	R0	Specifies the Route-Processor slot 0.
	rmi-connection-details	Displays the RMI connection details.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Examples

The following example shows how to verify the RMI link re-establishment count and the time since it is Up in a standby instance:

```
Device# show platform software rif-mgr chassis standby R0 rmi-connection-details
RMI Connection Details
    RMI Link re-establish count : 1
    RMI Link Uptime             : 1 hour 39 minute 9 seconds
    RMI Link Upsince            : 07/16/2021 01:31:41
```

The following example shows how to verify the RMI link re-establishment count and the time since it is Down in a standby instance:

```
Device# show platform software rif-mgr chassis standby R0 rmi-connection-details
RMI Connection Details
    RMI Link re-establish count : 1
    RMI Link Downtime           : 22 seconds
    RMI Link Downsince          : 07/16/2021 03:19:17
```

show platform software rif-mgr chassis active R0 rp-connection-details

To verify the RP link re-establishment count and the time since it is UP or Down in an active instance, use the **show platform software rif-mgr chassis active R0 rp-connection-details** command.

show platform software rif-mgr chassis active R0 rp-connection-details

Syntax Description		
	rif-mgr	Displays information about the RIF manager.
	chassis	Displays information about the chassis.
	active	Specifies the Active instance.
	R0	Specifies the Route-Processor slot 0.
	rp-connection-details	Displays the RP connection details.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Examples

The following example shows how to verify the RP link re-establishment count and the time since it is UP for days in an active instance:

```
Device# show platform software rif-mgr chassis active R0 rp-connection-details
RP Connection Details
    RP Connection Uptime  : 12 days 17 hours 1 minute 39 seconds
    RP Connection Upsince : 07/03/2021 07:06:20
```

The following example shows how to verify the RP link re-establishment count and the time since it is Down in an active instance:

```
Device# show platform software rif-mgr chassis active R0 rp-connection-details
RP Connection Details
    RP Connection Downtime    : 4 seconds
    RP Connection Downsince   : 07/16/2021 03:33:04
```

show platform software rif-mgr chassis standby R0 rp-connection-details

To verify the RP link re-establishment count and the time since it is UP or Down in a standby instance, use the **show platform software rif-mgr chassis standby R0 rp-connection-details** command.

show platform software rif-mgr chassis standby R0 rp-connection-details

Syntax Description		
	rif-mgr	Displays information about the RIF manager.
	chassis	Displays information about the chassis.
	standby	Specifies the Standby instance.
	R0	Specifies the Route-Processor slot 0.
	rp-connection-details	Displays the RP connection details.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Examples

The following example shows how to verify the RP link re-establishment count and the time since it is UP in a standby instance:

```
Device# show platform software rif-mgr chassis standby R0 rp-connection-details
RP Connection Details
    RP Connection Uptime  : 12 days 17 hours 2 minutes 1 second
    RP Connection Upsince : 07/03/2021 07:05:58
```

The following example shows how to verify the RP link re-establishment count and the time since it is Down in a standby instance:

```
Device# show platform software rif-mgr chassis standby R0 rp-connection-details
RP Connection Details
    RP Connection Downtime    : 22 seconds
    RP Connection Downsince   : 07/16/2021 03:19:17
```

show platform software rif-mgr chassis active R0 rif-stk-internal-stats

To verify the RIF and stack manager internal statistics in an active instance, use the **show platform software rif-mgr chassis active R0 rif-stk-internal-stats** command.

show platform software rif-mgr chassis active R0 rif-stk-internal-stats

Syntax Description	rif-mgr	Displays information about the RIF manager.
	chassis	Displays information about the chassis.
	active	Specifies the Active instance.
	R0	Specifies the Route-Processor slot 0.
	rif-stk-internal-stats	Displays the RIF and stack manager internal statistics.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Example

The following example shows how to verify the RIF and stack manager internal statistics in an active instance:

```
Device# show platform software rif-mgr chassis active R0 rif-stk-internal-stats
RIF Stack Manager internal stats

    Stack-mgr reported RP down          : False
    DAD link status reported to Stack-Mgr : True
```

show platform software rif-mgr chassis standby R0 rif-stk-internal-stats

To verify the RIF and stack manager internal statistics in a standby instance, use the **show platform software rif-mgr chassis standby R0 rif-stk-internal-stats** command.

show platform software rif-mgr chassis standby R0 rif-stk-internal-stats

Syntax Description		
	rif-mgr	Displays information about the RIF manager.
	chassis	Displays information about the chassis.
	standby	Specifies the Standby instance.
	R0	Specifies the Route-Processor slot 0.
	rif-stk-internal-stats	Displays the RIF and stack manager internal statistics.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Example

The following example shows how to verify the RIF and stack manager internal statistics in a standby instance:

```
Device# show platform software rif-mgr chassis standby R0 rif-stk-internal-stats
RIF Stack Manager internal stats

    Stack-mgr reported RP down         : False
    DAD link status reported to Stack-Mgr : True
```

show platform software rif-mgr chassis active R0 lmp-statistics

To verify the number of packets sent or received for each type in an active instance, use the **show platform software rif-mgr chassis active R0 lmp-statistics** command.

show platform software rif-mgr chassis active R0 lmp-statistics

Syntax Description		
	rif-mgr	Displays information about the RIF manager.
	chassis	Displays information about the chassis.
	active	Specifies the Active instance.
	R0	Specifies the Route-Processor slot 0.
	lmp-statistics	Displays the LMP statistics.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Example

The following example shows how to verify the number of packets sent or received for each type in an active instance:

```
Device# show platform software rif-mgr chassis active R0 lmp-statistics
LMP Statistics

Info Type Sent                 : 6
Solicit Info Type Sent         : 0
Unsolicit Info Type Sent       : 6
Reload Type Sent               : 0
Recovery Type Sent             : 1
Gateway Info Type Sent         : 0
Enquiry Type Sent              : 0
Solicit Enquiry Type Sent      : 0
Unsolicit Enquiry Type Sent    : 0

Info Type Received             : 5
Solicit Info Type Received     : 2
Unsolicit Info Type Received   : 3
Reload Type Received           : 0
Recovery Type Received         : 0
Gateway Info Type Received     : 4
Enquiry Type Received          : 0
Solicit Enquiry Type Received  : 0
Unsolicit Enquiry Type Received : 0
```

show platform software rif-mgr chassis standby R0 lmp-statistics

To verify the number of packets sent or received for each type in a standby instance, use the **show platform software rif-mgr chassis standby R0 lmp-statistics** command.

show platform software rif-mgr chassis standby R0 lmp-statistics

Syntax Description		
	rif-mgr	Displays information about the RIF manager.
	chassis	Displays information about the chassis.
	standby	Specifies the Standby instance.
	R0	Specifies the Route-Processor slot 0.
	lmp-statistics	Displays the LMP statistics.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Example

The following example shows how to verify the number of packets sent or received for each type in a standby instance:

```
Device# show platform software rif-mgr chassis standby R0 lmp-statistics
LMP Statistics

Info Type Sent                 : 6
Solicit Info Type Sent         : 0
Unsolicit Info Type Sent       : 6
Reload Type Sent               : 0
Recovery Type Sent             : 0
Gateway Info Type Sent         : 4
Enquiry Type Sent              : 0
Solicit Enquiry Type Sent      : 0
Unsolicit Enquiry Type Sent    : 0

Info Type Received             : 5
Solicit Info Type Received     : 3
Unsolicit Info Type Received   : 2
Reload Type Received           : 0
Recovery Type Received         : 1
Gateway Info Type Received     : 0
Enquiry Type Received          : 0
```

show platform software rif-mgr chassis standby R0 lmp-statistics

```
Solicit Enquiry Type Received    : 0
Unsolicit Enquiry Type Received  : 0
```

show platform software sl-infra

To display troubleshooting information and for debugging, enter the **show platform software sl-infra** command in privileged EXEC mode. The output of this command is used by the technical support team, for troubleshooting and debugging.

show platform software sl-infra { **all** | **current** | **debug** | **stored** }

Syntax Description	**all**	Displays current, debugging, and stored information.
	current	Displays current license-related information.
	debug	Enables debugging
	stored	Displays information that is stored on the product instance.
Command Modes	Privileged EXEC	
Command History	**Release**	**Modification**
	Cisco IOS XE Amsterdam 17.3.2a	This command was introduced.

Usage Guidelines   When you encounter an error message that you are not able to resolve, along with a copy of the message that appears on the console or in the system log, provide your Cisco technical support representative with sample output of these commands: **show license tech support**, **show license history message**, and the **show platform software sl-infra all** privileged EXEC commands.

show platform software tls client summary

To view the TLS client summary details, use the **show platform software tls client summary** command.

show platform software tls client summary

Syntax Description   This command has no keywords or arguments.

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Examples   This example shows how to view the TLS client summary details:

```
Device # show platform software tls client summary

Name    ID    Gateway   Port   Auth    Trustpoint   DPD Time Rekey Time  Retry Time
-------------------------------------------------------------------------------
fqdn    0               8443   PSK     N/A          60       300         20
```

show platform software client detail

To display a summary of TLS client session detail, session statistics, tunnel statistics, and DNS counters, use the **show platform software client detail** command.

show platform software client detail

Syntax Description	This command has no keywords or arguments.

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Examples

This example shows how to view the TLS client summary details:

```
Device # show platform software client detail

TLS Client          : Session Detail
Session Name        : fqdn
FQDN resolved IP    : 10.194.234.149
ID                  : 0
Created             : 04/20/21 00:36:42
Updated             : 04/22/21 05:56:03
State               : Up (Rekey)
Up Time             : 04/21/21 20:30:21 ( 9 hours 25 minutes 45 seconds )
Down Time           : 04/21/21 20:30:01
Rekey Time          : 04/22/21 05:55:51 ( 15 seconds )

TLS Session Statistics

Up Notifications    : 3
Down Notifications  : 2
Rekey Notifications : 636
DP State Updates    : 0
DPD Cleanups        : 0

Packets From     Packets To  Packet Errors To     Bytes From            Bytes To
--------------------------------------------------------------------------------
  BinOS             80           0                                          0
  IOSd               0           0                  0                       0

  TLS Client         0           0                  0                       0


TLS Tunnel Statistics
Type           Tx Packets     Rx Packets
-----------------------------------------
  Total            0              80
  CSTP Ctrl      3836           3836
  CSTP Data        80              0

Type          Requests      Responses
-----------------------------------------
```

```
CSTP Cfg            639                      639
CSTP DPD            3197                     3197

Invalid CSTP Rx           : 0
Injected Packet Success   : 0
Injected Packet Failed    : 0
Consumed Packets          : 0

TLS Tunnel DNS Counters
DNS Resolve Request Success Count    : 641
DNS Resolve Request Failure Count    :  0
DNS Resolve Success Count            : 639
DNS Resolve Failure Count            :  2
```

show platform software tls statistics

To view the TLS client global statistic details, use the **show platform software tls statistics** command.

show platform software tls statistics

Syntax Description	This command has no keywords or arguments.

Command Modes	Global configuration

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Examples

This example shows how to view the TLS client summary details:

```
Device # show platform software tls statistics

TLS Client - Global Statistics
Session Statistics
Up/Down         : 5/2
Rekeys          : 636
DP Updates      :  0
DPD Cleanups    :  0

Packets From    Packets To   Packet Errors To    Bytes From   Bytes To
------------------------------------------------------------------
BinOS           85           0                   0            0
IOSd 0          0            0                   0            0
TLS Client  0   0                                0            0

Tunnel Statistics
SSL Handshake Init/Done    : 641/641
TCP Connection Req/Done    : 641/641

Tunnel Packets
Rx/Tx                      : 85/0
Injected / Failed          : 0/0
Consumed                   :  0

CSTP Packets
Control Rx/Tx              : 3839 / 3839
Data Rx/Tx                 : 0 / 85
Config Req/Resp            : 641 / 641
DPD Req/Resp               : 3198 / 3198
Invalid Rx                 : 0

FQDN Counters
Req/Resp/Success           : 0/0/0

NAT Counters
Transalte In/Out           : 0/0
Ignore    In/Out           : 0/0
Failed                     : 0
Invalid                    : 0
```

```
No Entry                    : 0
Unsupported                 : 0

Internal Counters
Type          Allocated          Freed
-------------------------------------------------
EV            1299               1295
Tunnel        5                  4
Conn          643                642
Sess          3                  2

Config Message Related Counters
Type            Success            Failed
-------------------------------------------------
Create          3                  0
Delete          2                  0
```

show platform software tls session summary

To view the tls client session summary, use the **show platform software tls session summary** command.

show platform software tls session summary

Syntax Description   This command has no keywords or arguments.

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Examples   This example shows how to view the TLS client summary details:

```
Device # show platform software tls session summary

TLS Client - Session Summary
Name    ID     Created         State   Since            Elapsed
-------------------------------------------------------------------------------------
fqdn    0      04/20/21 00:36:42   Up     04/21/21 20:30:21   9 hours 26 minutes 44 seconds
```

show lisp site detail

To see detailed Locator ID Separation Protocol (LISP) site information on a map server, use the **show lisp site detail** command.

show lisp site detail [**eid-table** {**default** | **vlan** *vlan-id* | **vrf** *vrf-name* } | **instance-id** *id-number* | **internal** {**eid-table** {**default** | **vlan** *vlan-id* | **vrf** *vrf-name*} | **instance-id** *id-number*}]

Syntax Description		
eid-table	Option to enter the EID table.	
default	Shows the information for the default VRF.	
vlan *vlan-id*	Enter the VLAN information.	
vrf *vrf-name*	Enter the VRF name.	
instance-id *id-number*	Enter the EID instance ID.	
internal	Shows the site's detailed internal information.	

Command Default	None

Command Modes	Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see detailed Locator ID Separation Protocol (LISP) site information on a map server:

```
Device# show lisp site detail
```

show logging profile wireless end timestamp

To specify log filtering end location timestamp for filtering, use the **show logging profile wireless end timestamp** command.

show logging profile wireless end timestamp *time-stamp*

Syntax Description	*time-stamp*	Time to end the filtering. For example, 2017/02/10 14:41:50.849.

Command Default None

Command Modes Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines Ensure that you enable internal keyword using the **show logging profile wireless internal** command to get the trace output.

Example

The following example shows how to specify log filtering end location timestamp for filtering:

```
Device# show logging profile wireless end timestamp 2017/02/10 14:41:50.849
```

show logging profile wireless filter

To specify filter for logs, use the **show logging profile wireless filter** command.

show logging profile wireless filter {**ipv4** | **mac** | **string** | **uuid** }

Syntax Description	**ipv4** Selects logs with specific IP address app context.
	mac Selects logs with specific MAC app context.
	string Selects logs with specific string app context.
	uuid Selects logs with specific Universally Unique Identifier (UUID) app context.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines Ensure that you enable **internal** keyword using the **show logging profile wireless internal** command to get the trace output.

Without the **internal** keyword, only customer curated logs are displayed.

Example

The following example shows how to specify filter for logs:

```
Device# show logging profile wireless filter ipv4 10.10.11.1
```

show logging profile wireless fru

To specify field-replaceable unit (FRU) specific commands, use the **show logging profile wireless fru** command.

show logging profile wireless fru {0 {reverse | to-file}| chassis} ｛**0** ｛**reverse** | **to-file** ｝ | **chassis** ｝

Syntax Description	**0**	SPA-Inter-Processor slot 0.
	reverse	Shows logs in reverse chronological order.
	to-file	Decodes files stored in disk and write output to file.
	chassis	Chassis name.

Command Default	None

Command Modes	Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines Ensure that you enable **internal** keyword using the **show logging profile wireless internal** command to get the trace output.

Without the **internal** keyword, only customer curated logs are displayed.

Example

The following example shows how to specify FRU specific commands:

```
Device# show logging profile wireless fru 0
```

show logging profile wireless internal

To select all the logs, use the **show logging profile wireless internal** command.

show logging profile wireless internal

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   Ensure that you enable **internal** keyword using the **show logging profile wireless internal** command to get the trace output.

Without the **internal** keyword, only customer curated logs are displayed.

Example

The following example shows how to display all the logs:

```
Device# show logging profile wireless internal
```

show logging profile wireless level

To select logs above a specific level, use the **show logging profile wireless level** command.

show logging profile wireless level {**debug** | **emergency** | **error** | **info** | **noise** | **notice** | **verbose** | **warning** }

Syntax Description		
	debug	Selects debug messages.
	emergency	Selects emergency possible messags.
	error	Selects error messages.
	info	Selects informational messages.
	noise	Selects maximum possible messages.
	notice	Selects notice messages.
	verbose	Selects verbose debug messages.
	warning	Selects warning messages.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   Ensure that you enable **internal** keyword using the **show logging profile wireless internal** command to get the trace output.

Without the **internal** keyword, only customer curated logs are displayed.

Example

The following example shows how to select logs above a specific level:

```
Device# show logging profile wireless level info
```

show logging profile wireless module

To select logs for specific modules, use the **show logging profile wireless module** command.

show logging profile wireless module *module-name*

Syntax Description	*module-name* A comma or space separated list of module names. For example, dbal, tdllib or "dbal tdllib".

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   Ensure that you enable **internal** keyword using the **show logging profile wireless internal** command to get the trace output.

Without the **internal** keyword, only customer curated logs are displayed.

Example

The following example shows how to select logs for specific modules:

```
Device# show logging profile wireless module dbal
```

show logging profile wireless reverse

To view logs in reverse chronological order, use the **show logging profile wireless reverse** command.

show logging profile wireless reverse

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

Ensure that you enable **internal** keyword using the **show logging profile wireless internal** command to get the trace output.

Without the **internal** keyword, only customer curated logs are displayed.

Example

The following example shows how to view logs in reverse chronological order:

```
Device# show logging profile wireless reverse
```

show logging profile wireless start

To specify log filtering start location, use the **show logging profile wireless start** command.

show logging profile wireless start {**marker** *marker* | **timestamp** *time-stamp*}

Syntax Description	**marker** The marker to start filtering from. It must match with previously set marker.
	timestamp The timestamp for filtering. for example, "2017/02/10 14:41:50.849".

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines Ensure that you enable **internal** keyword using the **show logging profile wireless internal** command to get the trace output.

Without the **internal** keyword, only customer curated logs are displayed.

Example

The following example shows how to specify log filtering start location:

```
Device# show logging profile wireless start timestamp 2017/02/10 14:41:50.849
```

show logging profile wireless switch

To specify the switch to look for logs, use the **show logging profile wireless switch** command.

show logging profile wireless switch { *switch-num* | **active** | **standby** }

Syntax Description	*chassis-num*	Chassis number.
	active	Selects the active instance.
	standby	Selects the standby instance.

Command Default	None

Command Modes	Privileged EXEC (#)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

Ensure that you enable **internal** keyword using the **show logging profile wireless internal** command to get the trace output.

Without the **internal** keyword, only customer curated logs are displayed.

Example

The following example shows how to specify the chassis number to look for logs:

```
Device# show logging profile wireless switch active
```

show logging profile wireless to-file

To decode files stored in disk and write the output to a file, use the **show logging profile wireless to-file** command.

show logging profile wireless to-file *output-file-name*

Syntax Description

output-file-name	Output file name. File with this name will be created in the flash memory.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   Ensure that you enable **internal** keyword using the **show logging profile wireless internal** command to get the trace output.

Without the **internal** keyword, only customer curated logs are displayed.

Example

The following example shows how to decode files stored in disk and write the output to a file:

```
Device# show logging profile wireless to-file testfile
```

show mdns-sd cache

To view mDNS cache details, use the **show mdns-sd cache** command.

show mdns-sd cache { **ap-mac** *mac-address (H.H.H)* | **client-mac** *client-mac-address (H.H.H)* | **detail** | **glan-id** *<1 - 5>* | **location-group** *<0 - 4096>* | **mdns-ap** *mdns-ap mac address (H.H.H)* | **rlan-id** *<1 - 128>* | **statistics** | **type** { **A-AAAA** | **PTR** | **SRV** | **TXT** } | **udn** { *<1 - 4294967295>* | **shared** } | **wired** | **wlan-id** *<0 - 4096>* }

Syntax Description	**ap-mac** *mac-address (H.H.H)*	Specifies the AP Ethernet MAC address.
	client-mac *client-mac-address (H.H.H)*	Specifies the client MAC address.
	detail	Specifes the cache in detail.
	location-group *<0 - 4096>*	Specifies the location group. The value range is from 0 to 4096.
	mdns-ap *mdns-ap mac address (H.H.H)*	Specifies the cache learnt from a specific mDNS AP.
	rlan-id *<1 - 128>*	Specifies the remote LAN ID. The value range is from 1 - 128.
	statistics	Specifies the mDNS cache statistics.
	type	Specifies the mDNS record type. The record types are, A-AAAA, PTR, SRV, and TXT.
	udn *<1 - 4294967295>*	Specifies the UDN ID. The value range is from 1 to 4294967295.
	shared	Specifies the UDN shared services.
	wired	Specifies the mDNS services from wired clients.
	wlan-id *<0 - 4096>*	Specifies the WLAN ID. The value range is from 1 to 4096.

Command Default	None

Command Modes	Privileged EXEC mode

Command History	**Release**	**Modification**
	Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Usage Guidelines	None

Example

The following example shows how to view the mDNS cache details:

```
Device# show mdns-sd cache
```

show mdns-sd cache detail

To view the multicast DNS (mDNS) cache details, use the **show mdns-sd cache detail** command.

show mdns-sd cache detail

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced.

Example

The following is sample output from the **show mdns-sd cache detail** command:

```
Device# show mdns-sd cache detail

Name: _printer._tcp.local
  Type: PTR
  TTL: 4500
  VLAN: 21
  Client MAC: ace2.d3bc.047e
  Remaining-Time: 4383
  mDNS Service Policy: default-mdns-service-policy
  Rdata: HP OfficeJet Pro 8720 [BC047E] (2)._printer._tcp.local
```

show mdns-sd cache upn shared

To view the multicast DNS (mDNS) cache user personal network shared services details, use the **show mdns-sd cache upn shared** command.

show mdns-sd cache upn shared

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced.

Example

The following is sample output from the **show mdns-sd cache upn shared** command that displays the mDNS cache UPN shared services details:

```
Device# show mdns-sd cache upn shared

-------------------------------------------------------------- PTR Records
--------------------------------------------------------------
RECORD-NAME                                       TTL    TYPE    ID    CLIENT-MAC
RR-RECORD-DATA
──────────────────────────────────────────────────────────────────────────────
9.1.1.7.5.D.E.F.F.F.6.C.7.E.2.1.0.0.0.0.0.0.0.0  4500    WLAN    2    10e7.c6d5.7119
HP10E7C6D57119-2860.local
_services._dns-sd._udp.local                      4500    WLAN    2    10e7.c6d5.7119
_ipps._tcp.local
_universal._sub._ipps._tcp.local                  4500    WLAN    2    10e7.c6d5.7119
HP DeskJet 5000 series [D57119] (3127)._ipps._tcp.
_print._sub._ipps._tcp.local                      4500    WLAN    2    10e7.c6d5.7119
HP DeskJet 5000 series [D57119] (3127)._ipps._tcp.
_ePCL._sub._ipps._tcp.local                       4500    WLAN    2    10e7.c6d5.7119
HP DeskJet 5000 series [D57119] (3127)._ipps._tcp.
_ipps._tcp.local                                  4500    WLAN    2    10e7.c6d5.7119
HP DeskJet 5000 series [D57119] (3127)._ipps._tcp.
_services._dns-sd._udp.local                      4500    WLAN    2    10e7.c6d5.7119
_ipp._tcp.local
_universal._sub._ipp._tcp.local                   4500    WLAN    2    10e7.c6d5.7119
HP DeskJet 5000 series [D57119] (3127)._ipp._tcp.l
_print._sub._ipp._tcp.local                       4500    WLAN    2    10e7.c6d5.7119
HP DeskJet 5000 series [D57119] (3127)._ipp._tcp.l
_ePCL._sub._ipp._tcp.local                        4500    WLAN    2    10e7.c6d5.7119
HP DeskJet 5000 series [D57119] (3127)._ipp._tcp.l
.
.
.
-------------------------------------------------------------- SRV Records
--------------------------------------------------------------
RECORD-NAME                                       TTL    TYPE    ID    CLIENT-MAC
```

```
RR-RECORD-DATA
─────────────────────────────────────────────────────────────────
HP DeskJet 5000 series [D57119] (3127)._ipp._   4500      WLAN     2     10e7.c6d5.7119    0
  0 631 HP10E7C6D57119-2860.local
HP DeskJet 5000 series [D57119] (3127)._http.   4500      WLAN     2     10e7.c6d5.7119    0
  0 80 HP10E7C6D57119-2860.local
HP DeskJet 5000 series [D57119] (3127)._ipps.   4500      WLAN     2     10e7.c6d5.7119    0
  0 631 HP10E7C6D57119-2860.local
HP DeskJet 5000 series [D57119] (3127)._uscan   4500      WLAN     2     10e7.c6d5.7119    0
  0 8080 HP10E7C6D57119-2860.local
HP DeskJet 5000 series [D57119] (3127)._prive   4500      WLAN     2     10e7.c6d5.7119    0
  0 80 HP10E7C6D57119-2860.local
HP DeskJet 5000 series [D57119] (3127)._uscan   4500      WLAN     2     10e7.c6d5.7119    0
  0 443 HP10E7C6D57119-2860.local
HP DeskJet 5000 series [D57119] (3127)._scann   4500      WLAN     2     10e7.c6d5.7119    0
  0 8080 HP10E7C6D57119-2860.local
HP DeskJet 5000 series [D57119] (3127)._pdl-d   4500      WLAN     2     10e7.c6d5.7119    0
  0 9100 HP10E7C6D57119-2860.local

------------------------------------------------------------ A/AAAA Records
-------------------------------------------------------------
RECORD-NAME                                     TTL      TYPE     ID    CLIENT-MAC
RR-RECORD-DATA
─────────────────────────────────────────────────────────────────
HP10E7C6D57119-2860.local                       4500      WLAN     2     10e7.c6d5.7119
8.16.16.99

------------------------------------------------------------ TXT Records
-------------------------------------------------------------
RECORD-NAME                                     TTL      TYPE     ID    CLIENT-MAC
RR-RECORD-DATA
─────────────────────────────────────────────────────────────────
HP DeskJet 5000 series [D57119] (3127)._ipp._   4500      WLAN     2     10e7.c6d5.7119
[502]'txtvers=1''adminurl=http://HP10E7C6D57119-28
HP DeskJet 5000 series [D57119] (3127)._http.   4500      WLAN     2     10e7.c6d5.7119
[1]''
HP DeskJet 5000 series [D57119] (3127)._ipps.   4500      WLAN     2     10e7.c6d5.7119
[502]'txtvers=1''adminurl=http://HP10E7C6D57119-28
HP DeskJet 5000 series [D57119] (3127)._uscan   4500      WLAN     2     10e7.c6d5.7119
[280]'txtvers=1''adminurl=http://HP10E7C6D57119-28
HP DeskJet 5000 series [D57119] (3127)._prive   4500      WLAN     2     10e7.c6d5.7119
[124]'txtvers=1''ty=HP DeskJet 5000 series [D57119
HP DeskJet 5000 series [D57119] (3127)._uscan   4500      WLAN     2     10e7.c6d5.7119
[280]'txtvers=1''adminurl=http://HP10E7C6D57119-28
HP DeskJet 5000 series [D57119] (3127)._scann   4500      WLAN     2     10e7.c6d5.7119
[177]'txtvers=1''adminurl=http://HP10E7C6D57119-28
HP DeskJet 5000 series [D57119] (3127)._pdl-d   4500      WLAN     2     10e7.c6d5.7119
[211]'txtvers=1''rp=''priority=40''UUID=9fe36149-9
```

show mdns-sd cache upn detail

To view the multicast DNS (mDNS) cache user personal network identifier details, use the **show mdns-sd cache upn detail** command.

show mdns-sd cache upn*upn-id* **detail**

Syntax Description

upn-id	User personal network identifier.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced.

Example

The following is sample output from the **show mdns-sd cache upn detail** command that displays the mDNS cache UPN identifier details:

```
Device# show mdns-sd cache upn 777 detail

Name: _services._dns-sd._udp.local
  Type: PTR
  TTL: 4500
  WLAN: 2
  WLAN Name: mdns-psk
  VLAN: 16
  Client MAC: f4f9.51e2.a6a6
  AP Ethernet MAC: 002a.1087.d68a
  Remaining-Time: 4486
  Site-Tag: default-site-tag
  mDNS Service Policy: madhu-mDNS-Policy
  Overriding mDNS Service Policy: NO
  UPN-ID: 7777
  UPN-Status: Enabled
  Rdata: _airplay._tcp.local
```

show mdns-sd flexconnect summary

To view the summary of the mDNS flexconnect sites, use the **show mdns-sd flexconnect summary** command.

show mdns-sd flexconnect summary

Syntax Description	This command has no keywords or arguments.

Command Default	None

Command Modes	Privileged EXEC mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Usage Guidelines	None

Example

The following example shows how to view the summary of mDNS flexconnect sites:

```
Device# show mdns-sd flexconnect summary
```

show mdns-sd statistics

To view the mDNS statistics, use the **show mdns-sd statistics** command.

show mdns-sd statistics { **debug** | **flexconnect** | **rlan-id** *<1 - 128>* **wired** | **wlan-id** *<1 - 4096>* }

Syntax Description		
debug	Specifies the mDNS debug statistics.	
flexconnect	Specifies the mDNS flexconnect statistics.	
rlan-id*<1 - 128>*	Specifies the remote LAN (RLAN) ID. The value range is from 1 to 128.	
wired	Specifies the mDNS wired statistics.	
wlan-id*<1 - 4096>*	Specifies the WLAN ID. The value range is from 1 to 4096.	

Command Default   None

Command Modes   Privileged EXEC mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Usage Guidelines   None

Example

The following example shows how to view the mDNS statistics:

```
Device# show mdns-sd statistics
```

show mdns-sd summary

To view the summary of mDNS service discovery configuration, use the **show mdns-sd summary** command.

show mdns-sd summary

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

Usage Guidelines

None

Example

The following example shows how to view the summary of mDNS service discovery configuration:

```
Device# show mdns-sd summary
```

show mdns-sd sp-sdg statistics

To verify the Service-Peer SDG communication statistics, use the **show mdns-sd sp-sdg statistics** command.

show mdns-sd sp-sdg statistics

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

The following example shows how to verify the Service-Peer SDG communication statistics:

```
Device# show mdns-sd sp-sdg statistics
                        One min, 5 mins, 1 hour
Average Input rate (pps) :   0,       0,    0
Average Output rate (pps) :   0,       0,    0
Messages sent:
Query : 0
ANY query : 0
Advertisements : 0
Advertisement Withdraw : 0
Interface down : 0
Vlan down : 0
Service-peer ID change : 0
Service-peer cache clear : 0
Resync response : 0
Keep-Alive : 1
Messages received:
Query response : 0
ANY Query response : 0
Cache-sync : 0
Get service-instance : 0
Keep-Alive response : 1
```

show mobility

To display information about the Layer 3 mobility and the wireless network, use the **showmobility** command in privileged EXEC mode.

show mobility {**ap** [*ip-address*] | **mn** [**ip** *ip-address*] | **mac** *mac-address* | **network** *network-id* | **status**}

Syntax Description

ap	Displays information about the access point.
ip-address	(Optional) IP address.
mn	Displays information about the mobile node.
ip *ip-address*	(Optional) Displays information about the IP database thread.
mac *mac-address*	Displays information about the MAC database thread.
network *network-id*	Displays information for a specific wireless network ID.
status	Displays status information.

Command Modes Privileged EXEC

Command History

Release	Modification
12.2(18)SXD	This command was introduced on the Supervisor Engine 720.
12.2(18)SXD3	The output of this command was changed to include the TCP adjust-mss status.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines This command is supported on Cisco 7600 series routers that are configured with a WLSM only.

Examples This example shows how to display information about the access point:

```
Router# show mobility
 ap
AP IP Address   AP Mac Address Wireless Network-ID
--------------- -------------- -------------------
10.1.1.2 000d.29a2.a852 101 102 109 103
```

This example shows how to display information about the access points for a specific network ID:

```
Router# show mobility
 ap 172.16.1.2 detail
IP Address : 172.16.1.2
MAC Address : 000d.29a2.a852
Participating Wireless Tunnels: 101, 102, 109, 103
Registered Mobile Nodes on AP {172.16.1.2, 000d.29a2.a852} :
MN Mac Address MN IP Address AP IP Address Wireless Network-ID
-------------- -------------- -------------- -------------------
000a.8afa.85c9 10.1.3.11 172.16.1.2 103
```

```
000d.bdb7.83f7 10.1.2.11 172.16.1.2 102
000d.bdb7.83fb 10.1.1.11 172.16.1.2 101
Router# show mobility
 network-id 101
Wireless Network ID : 101
Wireless Tunnel Source IP Address : 10.1.1.1
Wireless Network Properties : Trusted
Wireless Network State : Up
Registered Access Point on Wireless Network 101:
AP IP Address AP Mac Address Wireless Network-ID
-------------- -------------- ------------------
176.16.1.2 000d.29a2.a852 101 102 109 103
Registered Mobile Nodes on Wireless Network 101:
MN Mac Address MN IP Address AP IP Address Wireless Network-ID
-------------- -------------- -------------- ------------------
000d.bdb7.83fb 10.1.1.11 176.16.1.2 101
Router# show mobility
 status
WLAN Module is located in Slot: 4 (HSRP State: Active) LCP
Communication status      : up
MAC address used for Proxy ARP: 0030.a349.d800
Number of Wireless Tunnels    : 1
Number of Access Points       : 2
Number of Mobile Nodes        : 0
Wireless Tunnel Bindings:
Src IP Address   Wireless Network-ID  Flags
--------------   ------------------   -------
10.1.1.1         101                  B
Flags: T=Trusted, B=IP Broadcast enabled, A=TCP Adjust-mss enabled
```

	Command	Description
Related Commands	**mobility**	Configures the wireless mGRE tunnels.

show monitor capture

To display the contents of a monitor capture buffer or a capture point, use the **show monitor capture** command in privileged EXEC mode.

show monitor capture [*epc-capture-name* [**parameter** | **buffer** [**brief** | **detailed** | **dump**]]]

Syntax Description

epc-capture-name	Specifies the name of the embedded packet capture.
buffer	Displays the contents of the specified capture buffer.
dump	(Optional) Displays a hexadecimal dump of the captured packet in addition to the metadata.
brief	(Optional) Provides a brief output of the captured packet information.
detail	(Optional) Provides a detailed output of the captured packet information.
parameter	Reconstructs and displays EXEC commands that were used to specify the capture.
detailed	Provides a detailed output of the captured packet information.

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

Usage Guidelines   You can enter the **show monitor capture** command when the capture buffer is not in the running state.

If you enter the **detail** keyword, packets are decoded to the Layer 4 protocol level and displayed. If you enter the **dump** keyword, non-IP packets are displayed in hexadecimal dump format. An ACL can be configured as a display filter so that only packets permitted by the ACL are displayed.

The following example shows how to display all the packets in a capture buffer. The output is self-explanatory.

```
Device# show monitor capture mycap buffer

buffer size (KB) : 2048000
buffer used (KB) : 128
packets in buf : 17
packets dropped : 0
packets per sec : 3
```

The following example shows how to display the list of commands that were used to specify the capture:

```
Device# show monitor capture cap1 parameter

  monitor capture cap1 interface GigabitEthernet 1/0/1 both
```

```
monitor capture cap1 match any
monitor capture cap1 buffer size 10
monitor capture cap1 limit pps 1000
```

The following example shows how to display brief output from the captured packet information. The output is self-explanatory.

```
Device# show monitor capture cap1 buffer brief


-------------------------------------------------------------------
 #   size   timestamp     source               destination   protocol
-------------------------------------------------------------------
  0   62    0.000000   10.0.0.1        ->  203.0.113.254   UDP
  1   46    0.267992   10.0.1.2        ->  203.0.113.204   IGMP
  2   76    0.428979   172.16.255.3    ->  172.16.255.3    UDP
  3   62    1.613982   10.0.29.1       ->  172.16.200.2    UDP
  4   74    1.659970   10.0.1.3        ->  10.0.0.10       EIGRP
  5   90    2.016006   10.29.0.4       ->  203.0.113.224   UDP
  6   74    2.088008   10.1.9.2        ->  203.0.113.10    EIGRP
  7   76    2.114008   172.17.254.1    ->  172.16.255.1    UDP
  8   74    2.245990   10.29.0.3       ->  203.0.113.10    EIGRP
  9   46    2.262987   10.0.0.0        ->  203.0.113.1     IGMP
 10   77    2.362988   10.1.9.2        ->  203.0.113.10    EIGRP
 11   62    2.631971   10.29.0.2       ->  203.0.113.2     UDP
 12   74    2.934009   10.29.0.5       ->  203.0.113.10    EIGRP
 13   74    3.331984   10.29.0.6       ->  203.0.113.10    EIGRP
 14   46    3.499974   10.0.0.0        ->  203.0.113.1     IGMP
 15   46    4.304992   10.0.0.0        ->  203.0.113.1     IGMP
 16   76    5.157005   172.16.255.3    ->  172.17.255.3    UDP
```

The following example shows how to display all the packets in a capture buffer. The output is self-explanatory.

```
Device# show monitor capture cap1 buffer detailed

 -------------------------------------------------------------------
 #   size   timestamp     source               destination   protocol
-------------------------------------------------------------------
  0   62    0.000000   10.29.0.2          ->  172.16.255.3    UDP
0000:  01005E00 00020000 0C07AC1D 080045C0   ..^...........E.
0010:  00300000 00000111 CFDC091D 0002E000   .0..............
0020:  000207C1 07C1001C 802A0000 10030AFA   .........*......
0030:  1D006369 73636F00 0000091D 0001       ..example.......

  1   46    0.267992   10.0.0.0           ->  172.16.255.1    IGMP
0000:  01005E00 0002001B 2BF69280 080046C0   ..^.....+.....F.
0010:  00200000 00000102 44170000 0000E000   . ......D.......
0020:  00019404 00001700 E8FF0000 0000       ..............

  2   76    0.428979   172.16.255.3       ->  172.17.255.3    UDP
0000:  00000C07 AC1DB414 89031124 080045C0   ...........$..E.
0010:  003E0000 0000FF11 64C5AC10 FF03AC11   .>......d.......
0020:  FF030286 0286002A 84A40001 001EAC10   .......*........
0030:  FF030000 01000014 00000000 04000004   ................

  3   62    1.613982   10.26.11.3         ->  172.16.255.1    UDP
0000:  01005E00 0002001B 2BF68680 080045C0   ..^.....+.....E.
0010:  00300000 00000111 CFDB091D 0003E000   .0..............
0020:  000207C1 07C1001C 88B50000 08030A6E   ...............n
0030:  1D006369 73636F00 0000091D 0001       ..example.......

  4   74    1.659970   10.29.3.2          ->  172.16.255.2    EIGRP
0000:  01005E00 000A001B 2BF69280 080045C0   ..^.....+.....E.
```

```
0010:   003C0000 00000258 CE81091D 0002E000    .<.....X........
0020:   000A0205 F3000000 00000000 00000000    ................
0030:   00000000 00D10001 000C0100 01000000    ................

  5   90   2.016006   10.22.1.4          -> 203.0.113.1     UDP
0000:   FFFFFFFF FFFF001C 0F2EDC00 080045C0    ..............E.
0010:   004C0000 00000111 AFC1091D 0004FFFF    .L..............
0020:   FFFF007B 007B0038 5B14E500 06E80000    ...{.{.8[.......
0030:   00000021 BE23494E 49540000 00000000    ...!.#INIT......
```

The following example shows how to display a hexadecimal dump of the captured packet:

```
Device# show monitor capture cap1 buffer dump
0
 0000:   01005E00 00020000 0C07AC1D 080045C0    ..^...........E.
 0010:   00300000 00000111 CFDC091D 0002E000    .0..............
 0020:   000207C1 07C1001C 802A0000 10030AFA    .........*......
 0030:   1D006369 73636F00 0000091D 0001        ..example.......

1
 0000:   01005E00 0002001B 2BF69280 080046C0    ..^.....+.....F.
 0010:   00200000 00000102 44170000 0000E000    . ......D.......
 0020:   00019404 00001700 E8FF0000 0000        ..............

2
 0000:   01005E00 0002001B 2BF68680 080045C0    ..^.....+.....E.
 0010:   00300000 00000111 CFDB091D 0003E000    .0..............
 0020:   000207C1 07C1001C 88B50000 08030A6E    ...............n
 0030:   1D006369 73636F00 0000091D 0001        ..example.......

3
 0000:   01005E00 000A001C 0F2EDC00 080045C0    ..^...........E.
 0010:   003C0000 00000258 CE7F091D 0004E000    .<.....X........
 0020:   000A0205 F3000000 00000000 00000000    ................
 0030:   00000000 00D10001 000C0100 01000000    ................
 0040:   000F0004 00080501 0300                 ..........
```

show nmsp

To display the Network Mobility Services Protocol (NMSP) configuration settings, use the **show nmsp** command.

show nmsp {**attachment** | {**suppress interfaces**} | **capability** | **notification interval** | **statistics** {**connection** | **summary**} | **status** | **subscription detail** [*ip-addr*] | **summary**}

Syntax Description	**attachment suppress interfaces**	Displays attachment suppress interfaces.
	capability	Displays NMSP capabilities.
	notification interval	Displays the NMSP notification interval.
	statistics connection	Displays all connection-specific counters.
	statistics summary	Displays the NMSP counters.
	status	Displays status of active NMSP connections.
	subscription detail *ip-addr*	The details are only for the NMSP services subscribed to by a specific IP address.
	subscription summary	Displays details for all of the NMSP services to which the controller is subscribed. The details are only for the NMSP services subscribed to by a specific IP address.

Command Default	No default behavior or values.

Command Modes	Privileged EXEC

Command History	

Release	**Modification**
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

The following is sample output from the **show nmsp notification interval** command:

```
Device# show nmsp notification interval
NMSP Notification Intervals
---------------------------

RSSI Interval:
 Client              : 2 sec
 RFID                : 2 sec
 Rogue AP            : 2 sec
 Rogue Client        : 2 sec
Attachment Interval  : 30 sec
Location Interval    : 30 sec
```

show nmsp cloud-services statistics

To see NMSP cloud-service statistics, use the **show nmsp cloud-services statistics** command.

show nmsp cloud-services statistics [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	*chassis-number*	Chassis number as either 1 or 2.
	active R0	Active instance of the active NMSP cloud services in Route-processor slot 0.
	standby R0	Standby instance of the active NMSP cloud services in Route-processor slot 0.

Command Default	None

Command Modes	Privileged EXEC

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

This example shows how to see NMSP cloud-service statistics:

```
Device# show nmsp cloud-services statistics
```

show nmsp cloud-services summary

To see a summary of information about NMSP cloud-services, use the **show nmsp cloud-services summary** command.

show nmsp cloud-services summary [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	*chassis-number*	Chassis number as either 1 or 2.
	active R0	Active instance of the NMSP cloud services in Route-processor slot 0.
	standby R0	Standby instance of the active NMSP cloud services in Route-processor slot 0.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

This example shows how to see NMSP cloud-service summary information:

```
Device# show nmsp cloud-services summary
```

show nmsp subscription group detail all

To display the mobility services group subscription details of all CMX connections, use the **show nmsp subscription group detail all** command.

show nmsp subscription group detail all

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to display the mobility services group subscription details of all CMX connections:

```
Device# show nmsp subscription group detail all
```

show nmsp subscription group detail ap-list

To display the AP MAC list subscribed for a group by a CMX connection, use the **show nmsp subscription group detail ap-list** command.

show nmsp subscription group detail ap-list *group-name cmx-IP-addrress*

Syntax Description		
	group-name	CMX AP group name.
	cmx-IP-addrress	CMX IP address.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to verify the AP MAC list subscribed for a group by a CMX connection.

```
Device# show nmsp subscription group detail ap-list Group1 127.0.0.1

CMX IP address: 127.0.0.1
CMX Group name: Group1
CMX Group AP MACs:
: 00:00:00:00:70:02  00:00:00:00:66:02  00:99:00:00:00:02  00:00:00:bb:00:02
  00:00:00:00:55:02  00:00:00:00:50:02  00:33:00:00:00:02  00:d0:00:00:00:02
  00:10:00:10:00:02  00:00:00:06:00:02  00:00:00:02:00:02  00:00:00:00:40:02
  00:00:00:99:00:02  00:00:00:00:a0:02  00:00:77:00:00:02  00:22:00:00:00:02
  00:00:00:00:00:92  00:00:00:00:00:82  00:00:00:00:03:02  aa:00:00:00:00:02
  00:00:00:50:00:42  00:00:0d:00:00:02  00:00:00:00:00:32  00:00:00:cc:00:02
  00:00:00:88:00:02  20:00:00:00:00:02  10:00:00:00:00:02  01:00:00:00:00:02
  00:00:00:00:00:02  00:00:00:00:00:01  00:00:00:00:00:00
```

show nmsp subscription group detail services

To display the services subscribed for a group by a CMX connection, use the **show nmsp subscription group detail services** command.

show nmsp subscription group detail services *group-name cmx-IP-addrress*

Syntax Description

group-name	CMX AP group name.
cmx-IP-address	CMX IP address.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to verify the services subscribed for a group by a CMX connection.

```
Device# show nmsp subscription group detail services Group1 127.0.0.1

CMX IP address: 127.0.0.1
CMX Group name: Group1
CMX Group filtered services:
Service          Subservice
----------------------------
RSSI             Mobile Station,
Spectrum
Info
Statistics
```

show nmsp subscription group summary

To display the mobility services group subscription summary of all CMX connections, use the **show nmsp subscription group summary** command.

show nmsp subscription group summary

Syntax Description	This command has no keywords or arguments.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to verify the mobility services group subscription summary of all CMX connections.

```
Device# show nmsp subscription group summary

CMX IP address: 127.0.0.1
  Groups subscribed by this CMX server:
  Group name: Group1
```

show ntp associations

To display the status of Network Time Protocol (NTP) associations, use the **show ntp associations** command in privileged EXEC mode.

show ntp associations

Syntax Description	This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Example

The following example shows how to view NTP associations. :

```
Device# show ntp associations
  address          ref clock       st   when   poll reach  delay  offset   disp
*~10.1.1.99        72.163.32.44     2    918    1024   377  0.177   7.618  1.102
* sys.peer, # selected, + candidate, - outlyer, x falseticker, ~ configured
--
```

show parameter-map type webauth name

To verify the webauth parameters of a parameter map, use the **show parameter-map type webauth name** command.

show parameter-map type webauth name *parameter-map name*

Syntax Description

parameter-map name	Name of the parameter map.

Command Default None

Command Modes Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to verify the webauth parameters of a parameter map:

```
Device# configure terminal
Device(config)# show parameter-map type webauth name parameter-map-name
```

show platform conditions

To see information about conditional debugs, use the **show platform conditions** command.

show platform conditions

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see information about conditional debugs:

```
Device# show platform conditions
```

show platform hardware

To see the hardware platform Quantum flow processor datapath statistics, use the **show platform hardware chassis active qfp feature wireless wlclient datapath cpp-if-handle statistics** command.

show hardware chassis active qfp feature wireless wlclient datapath cpp-if-handle *client-cpp-value* **statistics** {**clear** | **start** | **stop**}

Syntax Description		
	active	Active instance.
	qfp	Quantum Flow Processor.
	wlclient	QFP wireless client.
	cpp-if-handle	client cpp interface handle.
	client-cpp-value	Client cpp if-handle value. The range is between 1 and 4294967295.
	statistics	Show Client Statistics.
	clear	Shows and Clears the Client Statistics.
	start	Start Client Statistics collection.
	stop	Stop Client Statistics collection.

Command Default	None
Command Modes	Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to start client statistics collection:

```
Device# show platform hardware chassis active qfp feature wireless wlclient datapath
cpp-if-handle cpp-if-handle value statistics start
```

show platform hardware chassis active qfp feature dns-snoop-agent client enabled-intf

To view the DSA enabled interfaces, use the **show platform hardware chassis active qfp feature dns-snoop-agent client enabled-intf** command.

show platform hardware chassis active qfp feature dns-snoop-agent client enabled-intf

Syntax Description   This command has no arguments.

Command Default   None

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the DSA enabled interfaces:

```
Device# show platform hardware chassis active qfp feature dns-snoop-agent client enabled-intf
Interface name: GigabitEthernet0/0/0, handle: 5
```

show platform hardware chassis active qfp feature dns-snoop-agent client hw-pattern-list

To view the OpenDNS string or FQDN filter for the pattern list, use the **show platform hardware chassis active qfp feature dns-snoop-agent client hw-pattern-list** command.

show platform hardware chassis active qfp feature dns-snoop-agent client hw-pattern-list {**fqdn-filter** *fqdn_filter_ID* | **odns_string**}

Syntax Description		
fqdn-filter	Displays the FQDN filter for the pattern list.
fqdn_filter_ID	Refers to the FQDN filter ID. The valid range is from 1 to 16.
odns_string	Displays the OpenDNS string for the pattern list.

Command Default None

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the FQDN filter for the pattern list:

```
Device# show platform hardware chassis active qfp feature dns-snoop-agent client
hw-pattern-list fqdn-filter 1
Filter Name: urllist_flex_preauth

Name: url1.dns.com
Feature mask: 16, Dirty: 0, Ref count: 0, Match count: 0
```

show platform hardware chassis active qfp feature dns-snoop-agent client info

To view the DSA client details, use the **show platform hardware chassis active qfp feature dns-snoop-agent client info** command.

show platform hardware chassis active qfp feature dns-snoop-agent client info

Syntax Description   This command has no arguments.

Command Default   None

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the DSA client details:

```
Device# show platform hardware chassis active qfp feature dns-snoop-agent client info
Number of patterns added/deleted/total: 2/0/2
Number of re_table rebuilt : : 0
Number of str_table rebuilt: : 2
Registered clients: 0x001fffff0
Number of transaction started/ended: 2/2
Memory pool size/limit: 512/81920
Pending Deletion Pattern List:
```

show platform hardware chassis active qfp feature dns-snoop-agent client pattern-list

To view the OpenDNS string or FQDN filter for the pattern list, use the **show platform hardware chassis active qfp feature dns-snoop-agent client pattern-list** command.

show platform hardware chassis active qfp feature dns-snoop-agent client pattern-list {**fqdn-filter** *fqdn_filter_ID* | **odns_string**}

Syntax Description	**fqdn-filter**	Displays the FQDN filter for the pattern list.
	fqdn_filter_ID	Refers to the FQDN filter ID. The valid range is from 1 to 16.
	odns_string	Displays the OpenDNS string for the pattern list.

Command Default None

Command Modes Global configuration

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the FQDN filter for the pattern list:

```
Device# show platform hardware chassis active qfp feature dns-snoop-agent client pattern-list
 fqdn-filter 1
Filter Name: urllist_flex_preauth
Pattern List in CPP client: 1

Name: url1.dns.com
feature_mask: 0x00000010, hw_ptr: 0xdf86d510
```

show platform hardware chassis active qfp feature dns-snoop-agent datapath ip-cache

To view the DSA IP cache table details, use the **show platform hardware chassis active qfp feature dns-snoop-agent datapath ip-cache** command.

show platform hardware chassis active qfp feature dns-snoop-agent datapath ip-cache {**address** [**ipv4** *ipv4_address* | **ipv6** *ipv6_address*] | **all** | **pattern** *regex_pattern*}

Syntax Description

address [**ipv4** *ipv4_address*	**ipv6** *ipv6_address*]	Displays the DSA address entry details
all	Displays all the DSA IP cache address details
pattern *regex_pattern*	Displays the DSA IP cache pattern details

Command Default None

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the DSA address entry details:

```
Device# show platform hardware chassis active qfp feature dns-snoop-agent datapath ip-cache
 address ipv4 104.122.2.194
IP address: 104.122.2.194, client(s): 32, regex: www.adobe.com, expire in 0 seconds
```

This example shows how to view all the DSA IP cache address details:

```
Device# show platform hardware chassis active qfp feature dns-snoop-agent datapath ip-cache
 all
IP Address       Client(s) Expire    Match        RegexId      Dirty
---------------------------------------------------------------------
172.217.13.228    2       132     .*google.com   0x4d7f9e20    0x0
```

This example shows how to view the DSA IP cache pattern details:

```
Device# show platform hardware chassis active qfp feature dns-snoop-agent datapath ip-cache
 pattern .*google*
1 IP Addresses matching pattern .*google*
IP Address               Client(s)  Expire   Match      RegexId    Dirty
------------------------------------------------------------------------
2607:f8b0:4004:800:0:0:0:2004  32          13    .*google*  0x31156220  0x0
```

show platform hardware chassis active qfp feature dns-snoop-agent datapath memory

To view the DSA datapath memory details, use the **show platform hardware chassis active qfp feature dns-snoop-agent datapath memory** command.

show platform hardware chassis active qfp feature dns-snoop-agent datapath memory

Syntax Description

This command has no arguments.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the DSA datapath memory details:

```
Device# show platform hardware chassis active qfp feature dns-snoop-agent datapath memory
Table-Name    Address      Size
---------------------------------------
IP Cache DB   0xda5bb420   512
IP Hash       0xda41f400   1024
String Table  0xdec6ac10
String Table  0xda41f010

==DSA Chunk info==
Chunk-Pool    Allocated    Total_Free    Init-Num    Low_Wat
----------------------------------------------------------
ip cache chunk   0            512          512         512

==DSA Runtime Info==
----------------------------------------------------------
dsa init state 0x7   dsa client mask 0x100010
```

show platform hardware chassis active qfp feature dns-snoop-agent datapath regexp-table

To view the DSA regular expression table, use the **show platform hardware chassis active qfp feature dns-snoop-agent datapath regexp-table** command.

show platform hardware chassis active qfp feature dns-snoop-agent datapath regexp-table

| Syntax Description | This command has no arguments. |

Command Default None

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the DSA regular expression table:

```
Device# show platform hardware chassis active qfp feature dns-snoop-agent datapath
regexp-table
String Table 0xdec6ac10    WLS_FQDN_GRP_1
String Table 0xda41f010    ODNS String
```

show platform hardware chassis active qfp feature dns-snoop-agent datapath stats

To view the DSA statistics, use the **show platform hardware chassis active qfp feature dns-snoop-agent datapath stats** command.

show platform hardware chassis active qfp feature dns-snoop-agent datapath stats

Syntax Description

This command has no arguments.

Command Default   None

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the DSA statistics:

```
Device# show platform hardware chassis active qfp feature dns-snoop-agent datapath stats
DNS Snoop Agent Stats:
  parser unknown pkt: 0
  parser not needed: 0
  parser fmt error: 0
  parser pa error: 0
  parser non resp: 0
  parser multiple name: 0
  parser dns name err: 0
  parser matched ip: 0
  parser redirect: 0
  parser whitelist redirect: 0
  parser blacklist redirect: 0
  parser invalid redirect ip: 0
  parser skip: 0
  regex locked: 0
  regex not matched: 0
  pkt drop whitelist no redirect ip: 0
  pkt drop blacklist no redirect ip: 0
  entries in use: 0
  ip cache allocation fail: 0
  ip addr add: 0
  ip addr update: 0
  ip addr delete: 0
  ip addr cache hit: 0
  ip addr cache miss: 0
  ip addr bad param: 0
  ip addr delete not found: 0
  ip cache not initialized: 0
```

show platform hardware chassis active qfp feature et-analytics datapath runtime

To view the ETA global state in datapath, use the **show platform hardware chassis active qfp feature et-analytics datapath runtime** command.

show platform hardware chassis active qfp feature et-analytics datapath runtime

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

This example shows how to view the ETA global and interface details:

```
Device# show platform hardware chassis active qfp feature et-analytics datapath runtime
ET-Analytics run-time information:
   Feature state: initialized (0x00000004)
   Inactive timeout : 15 secs (default 15 secs)
   WhiteList information :
      flag: False
      cgacl w0 : n/a
      cgacl w1 : n/a
   Flow CFG information :
      instance ID : 0x0
      feature ID : 0x1
      feature object ID : 0x1
      chunk ID : 0xC
```

show platform hardware chassis active qfp feature et-analytics datapath memory

To view the ETA memory details, use the **show platform hardware chassis active qfp feature et-analytics datapath memory** command.

show platform hardware chassis active qfp feature et-analytics datapath memory

Syntax Description

This command has no arguments.

Command Default   None

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the ETA memory details:

```
Device# show platform hardware chassis active qfp feature et-analytics datapath memory
ET-Analytics memory information:
   Size of FO : 3200 bytes
   No. of FO allocs : 0
   No. of FO frees : 0
```

show platform hardware chassis active qfp feature et-analytics datapath stats export

To view the ETA flow export in datapath, use the **show platform hardware chassis active qfp feature et-analytics datapath stats export** command.

show platform hardware chassis active qfp feature et-analytics datapath stats export

Syntax Description   This command has no arguments.

Command Default   None

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the ETA flow export in datapath:

```
Device# show platform hardware chassis active qfp feature et-analytics datapath stats export
ET-Analytics 192.168.5.2:2055 vrf 0 Stats:
   Export statistics:
      Total records exported : 5179231
      Total packets exported : 3124873
      Total bytes exported : 3783900196
      Total dropped records : 0
      Total dropped packets : 0
      Total dropped bytes : 0
      Total IDP records exported :
            initiator->responder : 1285146
            responder->initiator : 979284
      Total SPLT records exported:
            initiator->responder : 1285146
            responder->initiator : 979284
      Total SALT records exported:
            initiator->responder : 0
            responder->initiator : 0
      Total BD records exported :
            initiator->responder : 0
            responder->initiator : 0
      Total TLS records exported :
            initiator->responder : 309937
            responder->initiator : 329469
```

show platform hardware chassis active qfp feature et-analytics datapath stats flow

To view the ETA flow statistics, use the **show platform hardware chassis active qfp feature et-analytics datapath stats flow** command.

show platform hardware chassis active qfp feature et-analytics datapath stats flow

Syntax Description

This command has no arguments.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the ETA flow statistics:

```
Device# show platform hardware chassis active qfp feature et-analytics datapath stats flow
ET-Analytics Stats:
   Flow statistics:
      feature object allocs : 0
      feature object frees : 0
      flow create requests : 0
      flow create matching : 0
      flow create successful: 0
      flow create failed, CFT handle: 0
      flow create failed, getting FO: 0
      flow create failed, malloc FO : 0
      flow create failed, attach FO : 0
      flow create failed, match flow: 0
      flow create, aging already set: 0
      flow ageout requests : 0
      flow ageout failed, freeing FO: 0
      flow ipv4 ageout requests : 0
      flow ipv6 ageout requests : 0
      flow whitelist traffic match : 0
```

show platform hardware chassis active qfp feature wireless et-analytics eta-pending-client-tree

To view clients in the ETA pending wireless client tree, use the **show platform hardware chassis active qfp feature wireless et-analytics eta-pending-client-tree** command.

show platform hardware chassis active qfp feature wireless et-analytics eta-pending-client-tree

Syntax Description   This command has no arguments.

Command Default   None

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view clients in the ETA pending wireless client tree:

```
Device# show platform hardware chassis active qfp feature wireless et-analytics
eta-pending-client-tree
CPP IF_H   DPIDX        MAC Address    VLAN   AS  MS  WLAN        POA
-------------------------------------------------------------------
0X2A       0XA0000001   2c33.7a5b.827b  160    RN  LC  ewlc_ssid 0x90000003
0X2B       0XA0000002   2c33.7a5b.80fb  160    RN  LC  ewlc_ssid 0x90000003
```

show platform hardware chassis active qfp feature wireless et-analytics statistics

To view the ETA pending wireless client tree statistics, use the **show platform hardware chassis active qfp feature wireless et-analytics statistics** command.

show platform hardware chassis active qfp feature wireless et-analytics statistics

Syntax Description

This command has no arguments.

Command Default   None

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the ETA pending wireless client tree statistics:

```
Device# show platform hardware chassis active qfp feature wireless et-analytics statistics
Wireless ETA cpp-client plumbing statistics
Number of ETA pending clients : 2
Counter                                                Value
----------------------------------------------------------------
Enable ETA on wireless client called                     0
Delete ETA on wireless client called                     0
ETA global cfg init cb TVI FIA enable error              0
ETA global cfg init cb output SB read error             0
ETA global cfg init cb output SB write error            0
ETA global cfg init cb input SB read error              0
ETA global cfg init cb input SB write error             0
ETA global cfg init cb TVI FIA enable success           0
ETA global cfg uninit cb ingress feat disable           0
ETA global cfg uninit cb ingress cfg delete             0
ETA global cfg uninit cb egress feat disable            0
ETA global cfg uninit cb egress cfg delete er           0
ETA pending list insert entry called                     4
ETA pending list insert invalid arg error               0
ETA pending list insert entry exists error              0
ETA pending list insert no memory error                 0
ETA pending list insert entry failed                     0
ETA pending list insert entry success                    4
ETA pending list delete entry called                     2
ETA pending list delete invalid arg error               0
ETA pending list delete entry missing                    0
ETA pending list delete entry remove error              0
ETA pending list delete entry success                    2
```

show platform hardware slot R0 ha_port interface stats

To see the HA port interface setting status, use the **show platform hardware slot R0 ha_port interface stats** command.

show platform hardware slot R0 ha_port interface stats

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.5.1	This command was introduced.

Examples

This example shows how to see the HA port interface setting status:

```
Device# show platform hardware slot R0 ha_port interface stats
HA Port
ha_port   Link encap:Ethernet  HWaddr 70:18:a7:c8:80:70
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
          Memory:e0900000-e0920000


Settings for ha_port:
        Supported ports:         [ TP ]
        Supported link modes:    10baseT/Half 10baseT/Full
                                 100baseT/Half 100baseT/Full
                                 1000baseT/Full
        Supported pause frame use:  Symmetric
        Supports auto-negotiation:  Yes
        Supported FEC modes:      Not reported
        Advertised link modes:    10baseT/Half 10baseT/Full
                                 100baseT/Half 100baseT/Full
                                 1000baseT/Full
        Advertised pause frame use: Symmetric
        Advertised auto-negotiation: Yes
        Advertised FEC modes:     Not reported
        Speed:                    Unknown!
        Duplex:                   Unknown! (255)
        Port:                     Twisted Pair
        PHYAD:                    1
        Transceiver:              internal
        Auto-negotiation:         on
        MDI-X:                    off (auto)
        Supports Wake-on:         pumbg
        Wake-on:                  g
        Current message level:    0x00000007 (7)
                                  drv probe link
        Link detected:            no
```

```
NIC statistics:
    rx_packets:             0
    tx_packets:             0
    rx_bytes:               0
    tx_bytes:               0
    rx_broadcast:           0
    tx_broadcast:           0
    rx_multicast:           0
    tx_multicast:           0
    multicast:              0
    collisions:             0
    rx_crc_errors:          0
    rx_no_buffer_count:     0
    rx_missed_errors:       0
    tx_aborted_errors:      0
    tx_carrier_errors:      0
    tx_window_errors:       0
    tx_abort_late_coll:     0
    tx_deferred_ok:         0
    tx_single_coll_ok:      0
    tx_multi_coll_ok:       0
    tx_timeout_count:       0
    rx_long_length_errors:  0
    rx_short_length_errors: 0
    rx_align_errors:        0
    tx_tcp_seg_good:        0
    tx_tcp_seg_failed:      0
    rx_flow_control_xon:    0
    rx_flow_control_xoff:   0
    tx_flow_control_xon:    0
    tx_flow_control_xoff:   0
    rx_long_byte_count:     0
    tx_dma_out_of_sync:     0
    tx_smbus:               0
    rx_smbus:               0
    dropped_smbus:          0
    os2bmc_rx_by_bmc:       0
    os2bmc_tx_by_bmc:       0
    os2bmc_tx_by_host:      0
    os2bmc_rx_by_host:      0
    tx_hwtstamp_timeouts:   0
    rx_hwtstamp_cleared:    0
    rx_errors:              0
    tx_errors:              0
    tx_dropped:             0
    rx_length_errors:       0
    rx_over_errors:         0
    rx_frame_errors:        0
    rx_fifo_errors:         0
    tx_fifo_errors:         0
    tx_heartbeat_errors:    0
    tx_queue_0_packets:     0
    tx_queue_0_bytes:       0
    tx_queue_0_restart:     0
    tx_queue_1_packets:     0
    tx_queue_1_bytes:       0
    tx_queue_1_restart:     0
    rx_queue_0_packets:     0
    rx_queue_0_bytes:       0
    rx_queue_0_drops:       0
    rx_queue_0_csum_err:    0
    rx_queue_0_alloc_failed:0
    rx_queue_1_packets:     0
```

show platform hardware slot R0 ha_port interface stats

```
rx_queue_1_bytes:        0
rx_queue_1_drops:        0
rx_queue_1_csum_err:     0
rx_queue_1_alloc_failed:0
```

show platform integrity

To view the checksum record for boot stages, use the **show platform integrity** command.

show platform integrity [sign [nonce *nonce* **]]**

Syntax Description

sign	(Optional). Show signature.
nonce	(Optional). Enter a nonce value.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.4.1	This command was introduced.

The following example shows how to view the checksum record for boot stages:

```
Device# show platform integrity sign nonce 123
Platform: C9800-L-F-K9
Boot 0 Version: R04.1173930452019-06-11
Boot 0 Hash: A6C92C44976FC77DD42234444FFD87798FB9036A2762FAA4999A190A0258B18C
Boot Loader Version: 16.12(1r)
Boot Loader Hash:
FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
OS Version: 2020-03-19_20.26
OS Hashes:
C9800-L-universalk9_wlc.2020-03-19_20.26.SSA.bin:
53E2DF1A1A082E36FA4CAB817C1794EC9D69AC0E90BCCBFFECF9BCD0BCA9385AA9E9372ABF7431E4A08FC5E5B9670131C09D158E5B8A7B457501FE77AB9F1C26D
C9800-L-mono-universalk9_wlc.2020-03-19_20.26.SSA.pkg:
1D3279D53B0311CE42C669824DF86FB5596CD7CA45CA8D7FDC3D10657B8C9A48F4B0508D7BCFFD645CB6571AC1E674A57A82414E3D6E1666BE64E6132F707671
PCR0: EE14A2D5099DA343B3941C54A429C4AC1D3EE8E9B609F1AC00049768A470734E
PCR8: 78794D0F5667F8FA4E425E3CA2AF3CD99B90B219FD90222D622B3D563416BBAA
```

show platform software audit

To display the Security Enhanced Linux (SELinux) audit logs, use the **show platform software audit** command in privileged EXEC mode.

show platform software audit {**all** | **summary** | **0** | **1** | **2** | **F0** | **R0** | **FP active** | **RP active**}

Syntax Description

all	Shows the audit log from all the slots.
summary	Shows the audit log summary count from all the slots.
0	Shows the audit log for the SM-Inter-Processor slot 0.
1	Shows the audit log for the SM-Inter-Processor slot 1.
2	Shows the audit log for the SM-Inter-Processor slot 2.
F0	Shows the audit log for the Embedded-Service-Processor slot 0.
R0	Shows the audit log for the Route-Processor slot 0.
FP active	Shows the audit log for the active Embedded-Service-Processor slot.
RP active	Shows the audit log for the active Route-Processor slot.

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced on Cisco ISR 4000 series routers, Cisco CSR 1000V series routers, and Cisco 1000 ISR series routers running time-sensitive networking (TSN).
Cisco IOS XE Gibraltar 16.12.1	This command was implemented on Cisco Catalyst 9800 Series Wireless Controller.

Usage Guidelines   The **show platform software audit** command displays the system logs containing the access violation events.

In Cisco IOS XE Gibraltar 16.11.1, operation in a permissive mode is available - with the intent of confining specific components (process or application) of the IOS-XE platform. In the permissive mode, access violation events are detected and system logs are generated, but the event or operation itself is not blocked. The solution operates mainly in an access violation detection mode.

The following is a sample output of the `show software platform software audit summary` command:

```
Device# show platform software audit summary
===================================
AUDIT LOG ON ACTIVE
-----------------------------------
AVC Denial count: 7
```

The following is a sample output of the **show software platform software audit all** command. This command displays the information in the `audit.log` file.

```
Device# show platform software audit all
==================================
AUDIT LOG ON ACTIVE
----------------------------------
========== START ============
type=DAEMON_START msg=audit(1553837190.262:3031): op=start ver=2.6.6 format=raw kernel=4.4.172
 auid=4294967295 pid=446 subj=system_u:system_r:auditd_t:s0 res=success
type=NETFILTER_CFG msg=audit(1553837185.956:2): table=nat family=2 entries=0
type=MAC_STATUS msg=audit(1553837186.523:3): enforcing=1 old_enforcing=0 auid=4294967295
ses=4294967295
type=SYSCALL msg=audit(1553837186.523:3): arch=c000003e syscall=1 success=yes exit=1 a0=3
a1=7ffcf1c22070 a2=1 a3=0 items=0 ppid=203 pid=205 auid=4294967295 uid=0 gid=0 euid=0 suid=0
 fsuid=0 egid=0 sgid=0 fsgid=0 tty=(none) ses=4294967295 comm="load_policy"
exe="/usr/sbin/load_policy" subj=kernel key=(null)
type=PROCTITLE msg=audit(1553837186.523:3):
proctitle=2F7573722F7362696E2F6C6F61645F706F6C696379002D69
type=MAC_POLICY_LOAD msg=audit(1553837186.528:4): policy loaded auid=4294967295 ses=4294967295
type=SYSCALL msg=audit(1553837186.528:4): arch=c000003e syscall=1 success=yes exit=1693637
 a0=4 a1=7f792d1d6000 a2=19d7c5 a3=f items=0 ppid=203 pid=205 auid=4294967295 uid=0 gid=0
euid=0 suid=0 fsuid=0 egid=0 sgid=0 fsgid=0 tty=(none) ses=4294967295 comm="load_policy"
exe="/usr/sbin/load_policy" subj=system_u:system_r:kernel_t:s0 key=(null)
…
```

You can use the output of this command to copy the contents of `audit.log` to a file to then transfer to a remote host.

```
Device# show platform software audit all | redirect bootflash:audi_123.log

Device#dir bootflash:audi_123.log
Directory of bootflash:/audi_123.log
   27  -rw-            35305  Mar 29 2019 22:16:36 +00:00  audi_123.log

3249049600 bytes total (538112000 bytes free)
```

show platform software arp broadcast

To display the Address Resolution Protocol (ARP) broadcast status on an access point (AP), use the **show platform software arp broadcast** command.

show platform software arp broadcast

Syntax Description   This command has no arguments or keywords.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.8.1	This command was introduced.

Examples   The following example shows the ARP broadcast on an AP:

```
Device# show platform software arp broadcast

Arp broadcast is enabled on vlans:
20,50
```

show platform software system all

To check status of the current virtual machine and look for performance issues due to inadequate resources (or other issues with the hosting environment), use the **set platform software system all** command in privileged EXEC mode.

show platform software system all

Syntax Description

This command has no keywords or arguments.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples

This example shows how to check status of the current virtual machine and its resources:

```
Device# show platform software system all

Processor Details
=================
Number of Processors : 6
Processor : 1 - 6
vendor_id : GenuineIntel
cpu MHz   : 2593.750
cache size : 35840 KB
Crypto Supported : Yes
model name : Intel(R) Xeon(R) CPU E5-2690 v4 @ 2.60GHz

Memory Details
==============
Physical Memory : 16363904KB

VNIC Details
============
Name  Mac Address  Status Platform MTU
GigabitEthernet1 000c.2964.7126  UP 1500
GigabitEthernet2 000c.2964.7130  UP 1500

Hypervisor Details
==================
Hypervisor: VMWARE
Manufacturer: VMware, Inc.
Product Name: VMware Virtual Platform
Serial Number: VMware-56 4d e5 0a a7 dd 27 2b-0e 2f 36 6e 0f 64 71 26
UUID: 564DE50A-A7DD-272B-0E2F-366E0F647126
image_variant :

Boot Details
==================
Boot mode: BIOS
Bootloader version: 1.1
```

show platform software trace filter-binary

To display the most recent trace information for a specific module, use the **show platform software trace filter-binary** command in privileged EXEC or user EXEC mode.

show platform software trace filter-binary*modules* [**context** *mac-address*]

Syntax Description	**context***mac-address*	Represents the context used to filter. Additionally, you can filter based on module names and trace levels. The context keyword accepts either a MAC address or any other argument based on which a trace is tagged.

Command Modes	User EXEC (>)
	Privileged EXEC (#)

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   This command collates and sorts all the logs present in the `/tmp/.../` across all the processes relevant to the module. The trace logs of all the processes relevant to the specified module are printed to the console. This command also generates a file named `collated_log_{system time}` with the same content, in the `/crashinfo/tracelogs` directory.

Examples   This example shows how to display the trace information for a wireless module:

```
Device# show platform software trace filter-binary wireless
```

show platform software trace filter-binary

To display the most recent trace information for a specific module, use the **show platform software trace filter-binary** command in privileged EXEC or user EXEC mode.

show platform software trace filter-binary*modules* [**context** *mac-address*]

Syntax Description	**context***mac-address*	Represents the context used to filter. Additionally, you can filter based on module names and trace levels. The context keyword accepts either a MAC address or any other argument based on which a trace is tagged.

Command Modes   User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
	This command was introduced.

Usage Guidelines   This command collates and sorts all the logs present in the `/tmp/.../` across all the processes relevant to the module. The trace logs of all the processes relevant to the specified module are printed to the console. This command also generates a file named `collated_log_{system time}` with the same content, in the `/crashinfo/tracelogs` directory.

Examples   This example shows how to display the trace information for a wireless module:

```
Device# show platform software trace filter-binary wireless
```

show platform software trace level

To view the trace levels for all the modules under a specific process, use the **show platform software trace level** command in privileged EXEC or user EXEC mode.

show platform software trace level wireless [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	*process*

Process whose tracing level is being set. Options include:

- **chassis-manager**—The Chassis Manager process.
- **cli-agent**—The CLI Agent process.
- **cmm**—The CMM process.
- **dbm**—The Database Manager process.
- **emd**—The Environmental Monitoring process.
- **fed**—The Forwarding Engine Driver process.
- **forwarding-manager**—The Forwarding Manager process.
- **geo**—The Geo Manager process.
- **host-manager**—The Host Manager process.
- **interface-manager**—The Interface Manager process.
- **iomd**—The Input/Output Module daemon (IOMd) process.
- **ios**—The IOS process.
- **license-manager**—The License Manager process.
- **logger**—The Logging Manager process.
- **platform-mgr**—The Platform Manager process.
- **pluggable-services**—The Pluggable Services process.
- **replication-mgr**—The Replication Manager process.
- **shell-manager**—The Shell Manager process.
- **sif**—The Stack Interface (SIF) Manager process.
- **smd**—The Session Manager process.
- **stack-mgr**—The Stack Manager process.
- **table-manager**—The Table Manager Server.
- **thread-test**—The Multithread Manager process.
- **virt-manager**—The Virtualization Manager process.
- **wireless**—The wireless controller module process.

slot	Hardware slot where the process for which the trace level is set, is running. Options include:
	• *number*—Number of the SIP slot of the hardware module where the trace level is set. For instance, if you want to specify the SIP in SIP slot 2 of the switch, enter 2.
	• *SIP-slot / SPA-bay*—Number of the SIP switch slot and the number of the shared port adapter (SPA) bay of that SIP. For instance, if you want to specify the SPA in bay 2 of the SIP in switch slot 3, enter 3/2.
	• **F0**—The Embedded Service Processor in slot 0.
	• **F1**—The Embedded Service Processor in slot 1.
	• **FP active**—The active Embedded Service Processor.
	• **R0**—The route processor in slot 0.
	• **RP active**—The active route processor.
	• **switch** *<number>* —The switch, with its number specified.
	• **switch active**—The active switch.
	• **switch standby**—The standby switch.
	• *number*—Number of the SIP slot of the hardware module where the trace level is set. For instance, if you want to specify the SIP in SIP slot 2 of the switch, enter 2.
	• *SIP-slot / SPA-bay*—Number of the SIP switch slot and the number of the shared port adapter (SPA) bay of that SIP. For instance, if you want to specify the SPA in bay 2 of the SIP in switch slot 3, enter 3/2.
	• **F0**—The Embedded Service Processor in slot 0.
	• **FP active**—The active Embedded Service Processor.
	• **R0**—The route processor in slot 0.
	• **RP active**—The active route processor.

Syntax Description

chassis-number	Chassis number as either 1 or 2.
active R0	Active instance of the AP filters in Route-processor slot 0.
standby R0	Standby instance of the AP filters in Route-processor slot 0.

Command Modes   User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Examples

This example shows how to view the trace level:

```
Device# show platform software trace level dbm switch active R0
Module Name             Trace Level
-------------------------------------------------
binos                   Notice
binos/brand             Notice
bipc                    Notice
btrace                  Notice
bump_ptr_alloc          Notice
cdllib                  Notice
chasfs                  Notice
dbal                    Informational
dbm                     Debug
evlib                   Notice
evutil                  Notice
file_alloc              Notice
green-be                Notice
ios-avl                 Notice
klib                    Debug
services                Notice
sw_wdog                 Notice
syshw                   Notice
tdl_cdlcore_message     Notice
tdl_dbal_root_message   Notice
tdl_dbal_root_type      Notice
```

show platform software utd chassis active F0 et-analytics global

To view the ETA global and interface details, use the **show platform software utd chassis active F0 et-analytics global** command.

show platform software utd chassis active F0 et-analytics global

Syntax Description

This command has no arguments.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the ETA global and interface details:

```
Device# show platform software utd chassis active F0 et-analytics global
ET Analytics Global Configuration
ID: 1
All Interfaces: Off
IP address and port and vrf: 192.168.5.2:2055:0
```

show platform software et-analytics global

To view the ETA global configuration, use the **show platform software et-analytics global** command.

> ✎
>
> **Note** The **show platform software et-analytics global** command does not display the ETA enabled wireless client interfaces.

show platform software et-analytics global

Syntax Description

This command has no arguments.

Command Default None

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the ETA global and interface details:

```
Device# show platform software et-analytics global
ET-Analytics Global state
=========================
All Interfaces : Off
IP Flow-record Destination: 192.168.5.2 : 2055
Inactive timer: 15
```

show platform sudi certificate

To view the checksum record for a specific SUDI, use the **show platform sudi certificate** command.

show platform sudi certificate [sign [nonce *nonce* **]]**

Syntax Description

sign	(Optional). Show signature.
nonce	(Optional). Enter a nonce value.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.4.1	This command was introduced.

The following example shows how to view the checksum record for the specific SUDI:

```
Device# show platform sudi certificate sign nonce 123
-----BEGIN CERTIFICATE-----
MIIDQzCCAiugAwIBAgIQX/h7KCtU3I1CoxW1aMmt/zANBgkqhkiG9w0BAQUFADA1
MRYwFAYDVQQKEw1DaXNjbyBTeXN0ZW1zMRswGQYDVQQDExJDaXNjbyBSb290IENB
IDIwNDgwHhcNMDQwNTE0MjAxNzEyWhcNMjkwNTE0MjAyNTQyWjA1MRYwFAYDVQQK
Ew1DaXNjByBTeXN0ZW1zMRswGQYDVQQDExJDaXNjByBSb290IENBIDIwNDgwggEg
MA0GCSqGSIb3DQEBAQUAA4IBDQAwggEIAoIBAQCwmrmrp68Kd6ficba0ZmKUeIhH
xmJVhEAyv8CrLqUccda8bnuoqrpu0hWISEWdovyD0My5jOAmaHBKeN8hF570YQXJ
FcjPFto1YYmUQ6iEqDGYeJu5Tm8sUxJszR2tKyS7McQr/4NEb7Y9JHcJ6r8qqB9q
VvYgDxFUl4F1pyXOWWqCZe+36ufijXWLbvLdT6ZeYpzPEApk0E5tzivMW/VgpSdH
jWn0f84bcN5wGyDWbs2mAag8EtKpP6BrXruOIIt6keO1aO6g58QBdKhTCytKmg9l
Eg6CTY5j/e/rmxrbU6YTYK/CfdfHbBcl1HP7R2RQgYCUTOG/rksc35LtLgXfAgED
o1EwTzALBgNVHQ8EBAMCAYYwDwYDVR0TAQH/BAUwAwEB/zAdBgNVHQ4EFgQUJ/PI
FR5umgIJFq0roIlgX9p7L6owEAYJKwYBBAGCNxUBBAMCAQAwDQYJKoZIhvcNAQEF
BQADggEBAJ2dhISjQal8dwy3U8pORFBi71R803UXHOjgxkhLtv5MOhmBVrBW7hmW
Yqpao2TB9k5UM8Z3/sUcuuVdJcr18JOagxEu5sv4dEX+5wW4q+ffy0vhN4TauYuX
cB7w4ovXsNgOnbFp1iqRe6lJT37mjpXYgyc81WhJDtSd9i7rp77rMKSsH0T8lasz
Bvt9YAretIpjsJyp8qS5UwGH0GikJ3+r/+n6yUA4iGe0OcaEb1fJU9u6ju7AQ7L4
CYNu/2bPPu8Xs1gYJQk0XuPL1hS27PKSb3TkL4Eq1ZKR4OCXPDJoBYVL0fdX4lId
kxpUnwVwwEpxYB5DC2Ae/qPOgRnhCzU=
-----END CERTIFICATE-----
-----BEGIN CERTIFICATE-----
MIIEPDCCAySgAwIBAgIKYQlufQAAAAAADDANBgkqhkiG9w0BAQUFADA1MRYwFAYD
VQQKEw1DaXNjByBTeXN0ZW1zMRswGQYDVQQDExJDaXNjByBSb290IENBIDIwNDgw
HhcNMTEwNjMwMTc1NjU3WhcNMjkwNTE0MjAyNTQyWjAnMQ4wDAYDVQQKEwVDaXNj
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BXdGj13oVeF+EyFWLrFjj97fL2+8oauV43Qrvnf3d/GfqXj7ew+z/sXlXtEOjSXJ
URsyMEj53Rdd9tJwHky8neapszS+r+kdVQIDAQABo4IBWjCCAVYwCwYDVR0PBAQD
AgHGMB0GA1UdDgQWBBRI2PHxwnDVW7t8cwmTr7i4MAP4fzAfBgNVHSMEGDAWgBQn
88gVHm6aAgkWrSugiWBf2nsvqjBDBgNVHR8EPDA6MDigNqA0hjJodHRwOi8vd3d3
```

LmNpc2NvLmNvbS9zZWN1cml0eS9wa2kvY3JsL2NyY2EyMDQ4LmNybDBQBggrBgEF
BQcBAQREMEIwQAYIKwYBBQUHMAKGNGh0dHA6Ly93d3cuY2lzY28uY29tL3NlY3Vy
aXR5L3BraS9jZXJ0cy9jcmNhMjA0OC5jZXIwXAYDVR0gBFUwUzBRBgorBgEEAQkV
AQwAMEMwQQYIKwYBBQUHAgEWNWh0dHA6Ly93d3cuY2lzY28uY29tL3NlY3VyaXR5
L3BraS9wb2xpY3y9pbmRleC5odGlsMBIGA1UdEwEB/wQIMAYBAf8CAQAwDQYJ
KoZIhvcNAQEFBQADggEBAGh1qclr9tx4hzWgDERm371yeuEmqcIfi9b9+GbMSJbi
ZHc/CcCl0lJu0a9zTXA9w47H9/t6leduGxb4WeLxcwCiUgvFtCa51Iklt8nNbcKY
/4dw1ex+7amATUQO4QggIE67wVIPu6bgAE3Ja/nRS3xKYSnj8H5TehimBSv6TECi
i5jUhOWryAK4dVo8hCjkjEkzu3ufBTJapnv89g9OE+H3VKM4L+/KdkUO+52djFKn
hyl47d7cZR4DY4LIuFM2P1As8YyjzoNpK/urSRI14WdIlplR1nH7KNDl5618yfVP
0IFJZBGrooCRBjOSwFv8cpWCbmWdPaCQT2nwIjTfY8c=
-----END CERTIFICATE-----
-----BEGIN CERTIFICATE-----
MIIDfTCCAmWgAwIBAgIEAwQD7zANBgkqhkiG9w0BAQsFADAnMQ4wDAYDVQQKEwVD
aXNjbzEVMBMGA1UEAxMMQUNUMiBTVURJIENBMB4XDTE4MDkyMzIyMzIwNloXDTI5
MDUxNDIwMjU0MVowaTEnMCUGA1UEBRMeUElEOkM5NjAwLVNVUC0xIFNOOkNBVDIy
MzZMMFE5MQ4wDAYDVQQKEwVDaXNjbzEYMBYGA1UECxMPQUNULTIgTGl0ZSBTVURJ
MRQwEgYDVQQDEwtDOTYwMC1TVVAtMTCCASIwDQYJKoZIhvcNAQEBBQADggEPADCC
AQoCggEBANsh0jcvgh1pdOjP9KnffDnDc/zEHDzbCTWPJi2FZcsaSE5jvq6CUqc4
MYpNAZU2Jym7NSD8iQbMXwbnCtoL64QtxQeFhRYmc4d5o933M7GwpEH0I7HUSbO/
Fxyp7JBmGPPgAkY7rKsYENiNK2hiR7Q2O7X2BidOKknEuofWdJMNyMaZgLYLOHbJ
5oXaORxhUy3VRaxNl6qI7kYxuugg2LcAbZ539sRXe8JtHyK8llURNSGMiQ0S17pS
idGmrJJ0pEHA0EUVTZqEny3z+NW9uxLVSzu6+hEJYlqfI+YEf0DbVZly1cy5r/jF
yNdGuGKvd5agvgCly8aYMZa3P+D5S8sCAwEAAaNvMG0wDgYDVR0PAQH/BAQDAgXg
MAwGA1UdEwEB/wQCMAAwTQYDVR0RBEYwRKBCBgkrBgEEAQkVAgOgNRMzQ2hpcElE
PVUxUk5TVEl3TVRjd01TVVAgxNFBQUFwZndBQUFBQUFBQUFBQUFBQUhtSlU9MA0G
CSqGSIb3DQEBCwUAA4IBAQCrpHo/CUyk5Hs/asIcYW0ep8KocSkbNh8qamyd4oWD
e/MGJW9Bs5f09IEbILWPdytCCS2lSyJbxz2HvVDzdxQdxjDwUNiWuu3dWMXN/i67
yuCGM+lA1AAG5dT6lNgWYHh+YzsZm9eoq1+4NM+JuMXWsnzAK8rSy+dSpBxqFsBq
E0OlPsaK7y2h8gs+XrV9x+D48OZQkTRXpxhJfiWvs+EbdgsAM/vBxTAoTJPVmXWN
Cmcj9X52Xl3i4MdOUXocZLO2kh6JSgOYGkFeZifJ0iDvMfAf0cJ6+cEF6bSxAqBL
veel+8LmeiE/2O9h6qGHPPDacCaXA2oJCDHveAt8iPTG
-----END CERTIFICATE-----

Signature version: 1
Signature:

[illegible signature hexadecimal string]

show platform sudi pki

To validate whether a hardware unit is programmed correctly or not, use the **show platform sudi pki** command.

show platform sudi pki

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Examples The following example shows how to check whether a hardware unit is programmed correctly or not:

```
Device# show platform sudi pki

CMCA3 cert status : Enabled / Disabled

SUDI Issuer                      Validity status
-----------------------------------------------------------------
Cisco Manufacturing CA III       Valid / Not-valid
Cisco Manufacturing CA SHA2      Valid / Not-valid
Cisco Manufacturing CA           Valid / Not-valid
```

show parameter-map type umbrella global

To view the Umbrella global parameter map details, use the **show parameter-map type umbrella global** command.

show parameter-map type umbrella global

Syntax Description   This command has no arguments.

Command Default   None

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the Umbrella global parameter map details:

```
Device# show parameter-map type umbrella global
parameter-map type umbrella global
   token   57CC80106C087FB1B2A7BAB4F2F4373C00247166
   local-domain dns_wl
   dnscrypt
   udp-timeout 2
   resolver ipv4 208.67.220.220
   resolver ipv4 208.67.222.222
   resolver ipv6 2620:119:53::53
   resolver ipv6 2620:119:35::35
```

show policy-map

To display quality of service (QoS) policy maps, which define classification criteria for incoming traffic, use the **show policy-map** command in EXEC mode.

show **policy-map** [*policy-map-name* | **interface** *interface-id*]

show policy-map interface {**Auto-template** | **Capwap** | **GigabitEthernet** | **GroupVI** | **InternalInterface** | **Loopback** | **Lspvif** | **Null** | **Port-channel** | **TenGigabitEthernet** | **Tunnel** | **Vlan** | **brief** | **class** | **input** | **output**

show policy-map interface {**ap name** *ap_name* | **client mac** *mac_address* | **radio type** {**24ghz** | **5ghz**} **ap name** *ap_name* | **ssid name** *ssid_name* {**ap name** *ap_name* | **radio type** {**24ghz** | **5ghz**} **ap name** *ap_name*} }

Syntax Description	*policy-map-name*	(Optional) Name of the policy-map.
	interface *interface-id*	(Optional) Displays the statistics and the configurations of the input and output policies that are attached to the interface.
	ap name *ap_name*	Displays SSID policy configuration of an access point.
	client mac *mac_address*	Displays information about the policies for all the client targets.
	radio type {**24ghz** | **5ghz**	Displays policy configuration of the access point in the specified radio type.
	ssid name *ssid_name*	Displays policy configuration of an SSID.

Command Modes	User EXEC
	Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This comman

Usage Guidelines	Policy maps can include policers that specify the bandwidth limitations and the action to take if the limits are exceeded.

✎

Note   Though visible in the command-line help string, the **control-plane**, **session**, and **type** keywords are not supported, and the statistics shown in the display should be ignored.

To display classification counters for ternary content addressable memory (TCAM) (marking or policing) based policies, enter the interface ID. Classification counters have the following restrictions:

- Classification counters are supported only on wired ports (in the ingress and egress directions).

- Classification counters count packets instead of bytes.

- Only QoS configurations with marking or policing trigger the classification counter.

- As long as there is policing or marking action in the policy, the class-default will have classification counters.

- Classification counters are not port based. The counters are shared across targets sharing the same policy map. This means that the classification counter aggregates all packets belonging to the same class of the same policy which attach to different interfaces.

This is an example of output from the **show policy-map interface** command, where classification counters are displayed:

```
Device# show policy-map interface gigabitethernet1/0/1

  GigabitEthernet1/0/1

  Service-policy input: AutoQos-4.0-CiscoPhone-Input-Policy

    Class-map: AutoQos-4.0-Voip-Data-CiscoPhone-Class (match-any)
      0 packets
      Match: cos  5
        0 packets, 0 bytes
        5 minute rate 0 bps
      QoS Set
        dscp ef
      police:
          cir 128000 bps, bc 8000 bytes
        conformed 0 bytes; actions:
          transmit
        exceeded 0 bytes; actions:
          set-dscp-transmit dscp table policed-dscp
        conformed 0000 bps, exceed 0000 bps

    Class-map: AutoQos-4.0-Voip-Signal-CiscoPhone-Class (match-any)
      0 packets
      Match: cos  3
        0 packets, 0 bytes
        5 minute rate 0 bps
      QoS Set
        dscp cs3
      police:
          cir 32000 bps, bc 8000 bytes
        conformed 0 bytes; actions:
          transmit
        exceeded 0 bytes; actions:
          set-dscp-transmit dscp table policed-dscp
        conformed 0000 bps, exceed 0000 bps
```

```
        Class-map: AutoQos-4.0-Default-Class (match-any)
          0 packets
          Match: access-group name AutoQos-4.0-Acl-Default
            0 packets, 0 bytes
            5 minute rate 0 bps
          QoS Set
            dscp default

        Class-map: class-default (match-any)
          0 packets
          Match: any
            0 packets, 0 bytes
            5 minute rate 0 bps

    Service-policy output: AutoQos-4.0-Output-Policy

      queue stats for all priority classes:
        Queueing
        priority level 1

        (total drops) 0
        (bytes output) 0

      Class-map: AutoQos-4.0-Output-Priority-Queue (match-any)
        0 packets
        Match:  dscp cs4 (32) cs5 (40) ef (46)
          0 packets, 0 bytes
          5 minute rate 0 bps
        Match: cos  5
          0 packets, 0 bytes
          5 minute rate 0 bps
        Priority: 30% (300000 kbps), burst bytes 7500000,

        Priority Level: 1

      Class-map: AutoQos-4.0-Output-Control-Mgmt-Queue (match-any)
        0 packets
        Match:  dscp cs2 (16) cs3 (24) cs6 (48) cs7 (56)
          0 packets, 0 bytes
          5 minute rate 0 bps
        Match: cos  3
          0 packets, 0 bytes
          5 minute rate 0 bps
        Queueing
        queue-limit dscp 16 percent 80
        queue-limit dscp 24 percent 90
        queue-limit dscp 48 percent 100
        queue-limit dscp 56 percent 100

        (total drops) 0
        (bytes output) 0
        bandwidth remaining 10%

        queue-buffers ratio 10

      Class-map: AutoQos-4.0-Output-Multimedia-Conf-Queue (match-any)
        0 packets
        Match:  dscp af41 (34) af42 (36) af43 (38)
          0 packets, 0 bytes
          5 minute rate 0 bps
        Match: cos  4
          0 packets, 0 bytes
          5 minute rate 0 bps
        Queueing
```

```
        (total drops) 0
        (bytes output) 0
        bandwidth remaining 10%
        queue-buffers ratio 10

    Class-map: AutoQos-4.0-Output-Trans-Data-Queue (match-any)
        0 packets
        Match:  dscp af21 (18) af22 (20) af23 (22)
          0 packets, 0 bytes
          5 minute rate 0 bps
        Match: cos  2
          0 packets, 0 bytes
          5 minute rate 0 bps
        Queueing

        (total drops) 0
        (bytes output) 0
        bandwidth remaining 10%
        queue-buffers ratio 10

    Class-map: AutoQos-4.0-Output-Bulk-Data-Queue (match-any)
        0 packets
        Match:  dscp af11 (10) af12 (12) af13 (14)
          0 packets, 0 bytes
          5 minute rate 0 bps
        Match: cos  1
          0 packets, 0 bytes
          5 minute rate 0 bps
        Queueing

        (total drops) 0
        (bytes output) 0
        bandwidth remaining 4%
        queue-buffers ratio 10

    Class-map: AutoQos-4.0-Output-Scavenger-Queue (match-any)
        0 packets
        Match:  dscp cs1 (8)
          0 packets, 0 bytes
          5 minute rate 0 bps
        Queueing

        (total drops) 0
        (bytes output) 0
        bandwidth remaining 1%
        queue-buffers ratio 10

    Class-map: AutoQos-4.0-Output-Multimedia-Strm-Queue (match-any)
        0 packets
        Match:  dscp af31 (26) af32 (28) af33 (30)
          0 packets, 0 bytes
          5 minute rate 0 bps
        Queueing

        (total drops) 0
        (bytes output) 0
        bandwidth remaining 10%
        queue-buffers ratio 10

    Class-map: class-default (match-any)
        0 packets
        Match: any
          0 packets, 0 bytes
```

```
     5 minute rate 0 bps
Queueing

(total drops) 0
(bytes output) 0
bandwidth remaining 25%
queue-buffers ratio 25
```

show processes cpu

To display detailed CPU utilization statistics of IOS tasks, use the **show processes cpu** command.

show processes cpu　[**autoprofile** | **extended** | **history**　[**table**] | **sorted**　[**1min** | **5min** | **5sec**]]

Syntax Description		
autoprofile	(Optional) Displays IOS(d) 'automatic CPUHOG profiling' information.
extended	(Optional) Displays extended CPU usage report of last 5 seconds for IOS(d) process.
history	(Optional) Displays CPU history in a graph format.
table	(Optional) Displays CPU history in a table format.
sorted	(Optional) For Cisco IOS images only. Displays CPU utilization sorted by percentage.
history	(Optional) Sorts CPU utilization history. See Usage Guidelines for details.
1min	(Optional) Sorts CPU utilization based on 1-minute utilization.
5min	(Optional) Sorts CPU utilization based on 5-minute utilization.
5sec	(Optional) Sorts CPU utilization based on 5-second utilization.

Command Default　None

Command Modes　Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Amsterdam 17.3.1	This command was integrated into Cisco IOS XE Amsterdam 17.3.1.

Usage Guidelines　If you use the **history** keyword, three graphs are displayed for Cisco IOS images:

- CPU utilization for the last 60 seconds

- CPU utilization for the last 60 minutes

- CPU utilization for the last 72 hours

Maximum usage is measured and recorded every second. The average usage is calculated on periods of more than one second. Consistently high CPU utilization over an extended period indicates a problem.

To enable standby console, ensure that the following configuration is in place:

```
redundancy
main-cpu
secondary console enable
```

Example

The following is a sample output from the **show processes cpu** command without keywords:

```
Device# show processes cpu

CPU utilization for five seconds: 0%/0%; one minute: 0%; five minutes: 0%
 PID Runtime(ms)      Invoked      uSecs   5Sec   1Min   5Min TTY Process
  10    1576556        281188       5606  0.15%  0.05%  0.05%   0 Check heaps
 232     845057      54261160         15  0.07%  0.05%  0.06%   0 IPAM Manager
 595        177           300        590  0.07%  0.02%  0.01%   2 Virtual Exec
 138    1685973     108085955         15  0.07%  0.08%  0.08%   0 L2 LISP Punt Pro
 193      19644        348767         56  0.07%  0.00%  0.00%   0 DTP Protocol
   5          0             1          0  0.00%  0.00%  0.00%   0 CTS SGACL db cor
   4         24            15       1600  0.00%  0.00%  0.00%   0 RF Slave Main Th
   6          0             1          0  0.00%  0.00%  0.00%   0 Retransmission o
   7          0             1          0  0.00%  0.00%  0.00%   0 IPC ISSU Dispatc
   2     117631        348801        337  0.00%  0.00%  0.00%   0 Load Meter
   8          0             1          0  0.00%  0.00%  0.00%   0 EDDRI_MAIN
.
.
.
```

show rate-limit client

To configure the rate-limit for a client on the AP, use the **show rate-limit client** command.

show rate-limit client

Syntax Description   This command has no arguments.

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

The following example shows how to configure the rate-limit for a client on the AP:

```
Device# show rate-limit client
Config:
mac vap rt_rate_out rt_rate_in rt_burst_out rt_burst_in nrt_rate_out nrt_rate_in nrt_burst_out
 nrt_burst_in
00:1C:F1:09:85:E7 0 8001 8002 8003 8004 8005 8006 8007 8008
Statistics:
name up down
Unshaped 0 0
Client RT pass 0 0
Client NRT pass 0 0
Client RT drops 0 0
Client NRT drops 0 0
Per client rate limit:
mac vap rate_out rate_in policy
```

show remote-lan all

To view the detailed output of all RLANs, use the **show remote-lan all** command.

show   remote-lan   all

Command Default   None

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the detailed output of all RLANs:

```
Device# show remote-lan all
Remote-LAN Profile Name      : rlan_test_1
================================================
Identifier                       : 1
Status                           : Enabled
Mac-filtering                    : Not Configured
Number of Active Clients         : 1
Security_8021X                   : Disabled
8021.x Authentication list name  : Not Configured
Local Auth eap Profile Name      : Not Configured
Web Auth Security                : Disabled
Webauth Authentication list name : Not Configured
Web Auth Parameter Map           : Not Configured
Client association limit         : 0
Ipv4 Web Pre Auth Acl            : Not Configured
Ipv6 Web Pre Auth Acl            : Not Configured

Remote-LAN Profile Name      : rlan_test_2
================================================
Identifier                       : 2
Status                           : Enabled
Mac-filtering                    : Not Configured
Number of Active Clients         : 1
Security_8021X                   : Disabled
8021.x Authentication list name  : Not Configured
Local Auth eap Profile Name      : Not Configured
Web Auth Security                : Disabled
Webauth Authentication list name : Not Configured
Web Auth Parameter Map           : Not Configured
Client association limit         : 0
Ipv4 Web Pre Auth Acl            : Not Configured
Ipv6 Web Pre Auth Acl            : Not Configured
```

show remote-lan id

To view the RLAN configuration by ID, use the **show remote-lan id** command.

show remote-lan id *id*

Command Default None

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the RLAN configuration by ID:

```
Device# show remote-lan id <id>
Remote-LAN Profile Name      : rlan_test_1
=================================================
Identifier                                 : 1
Status                                     : Enabled
Mac-filtering                              : Not Configured
Number of Active Clients            : 1
Security_8021X                             : Disabled
8021.x Authentication list name       : Not Configured
Local Auth eap Profile Name           : Not Configured
Web Auth Security                          : Disabled
Webauth Authentication list name      : Not Configured
Web Auth Parameter Map                : Not Configured
Client association limit                   : 0
Ipv4 Web Pre Auth Acl                    : Not Configured
Ipv6 Web Pre Auth Acl                    : Not Configured
```

show remote-lan name

To view the RLAN configuration by profile name, use the **show remote-lan name** command.

show remote-lan name *profile-name*

Command Default	None

Command Modes	Global configuration

Command History

Release	**Modification**
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the RLAN configuration by profile name:

```
Device# show remote-lan name <profile-name>
Remote-LAN Profile Name      : rlan_test_1
================================================
Identifier                      : 1
Status                          : Enabled
Mac-filtering                   : Not Configured
Number of Active Clients        : 1
Security_8021X                  : Disabled
8021.x Authentication list name : Not Configured
Local Auth eap Profile Name     : Not Configured
Web Auth Security               : Disabled
Webauth Authentication list name : Not Configured
Web Auth Parameter Map          : Not Configured
Client association limit        : 0
Ipv4 Web Pre Auth Acl           : Not Configured
Ipv6 Web Pre Auth Acl           : Not Configured
```

show remote-lan policy detail

To view the RLAN policy profile details by profile name, use the **show remote-lan policy detail** command.

show remote-lan policy detail *rlan_profile_name*

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the RLAN policy profile details by profile name:

```
Device# show remote-lan policy detail <rlan_profile_name>
Profile Name                    : rlan_named_pp1
Status                                    : Enabled
Description                       :
REMOTE-LAN ACL
  IPv4 ACL name                           : Not Configured
  IPv6 ACL name                 : Not Configured
AAA Policy Params
  AAA Override                  : Disabled
  AAA Policy name               : default-aaa-policy
RLAN Switching policy
  Central Switching             : Enabled
  Central Dhcp                  : Enabled
VLAN                            : 20
Pre Authentication              : Disabled
Session Time out                : 1800
Violation Mode                  : REPLACE
Host Mode                       : SINGLE_HOST_MODE
Host mode VLANs
  Voice Vlan Id                 : Not Configured
  Data Vlan Id                  : Not Configured
Exclusionlist Params
  Exclusionlist                 : Enabled
  Exclusion Timeout             : 60
Flow Monitor IPv4
  Flow Monitor Ingress Name     : Not Configured
  Flow Monitor Egress Name      : Not Configured
  Flow Moniter Ingress status   : Disabled
  Flow Moniter egress status    : Disabled
Flow Monitor IPv6
  Flow Monitor Ingress Name     : Not Configured
  Flow Monitor Egress Name      : Not Configured
  Flow Moniter Ingress status   : Disabled
  Flow Moniter egress status    : Disabled
Split Tunnel Parameters
  Status                        : Disabled
  ACL name                      : Not Configured
  Override Status               : Disabled
  Gateway Address               : Not Configured
  Netmask Address               : Not Configured
DHCP
```

```
        DHCP Required                   : Disabled
        DHCP Server                     : Not Configured
     Accounting List                    : Not Configured
```

show remote-lan policy summary

To view the summary of policy profile for all RLANs, use the **show remote-lan policy summary** command.

show remote-lan policy summary

| **Command Default** | None |

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the summary of policy profile for all RLANs:

```
Device# show remote-lan policy summary
Number of Policy Profiles: 1

Profile Name                     Description                         Status

---------------------------------------------------------------------------------------------
rlan_named_pp1                   Testing RLAN policy profile         Enabled
```

show remote-lan summary

To view the summary of all RLANs, use the **show remote-lan summary** command.

show   remote-lan   summary

Syntax Description

This command has no arguments.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the summary of all RLANs:

```
Device# show remote-lan summary
Number of RLANs: 1

RLAN    Profile Name                    Status
----------------------------------------------------------------
1       rlan_test_1                     Enabled
```

show sdavc ap download status

To view the per access point (per-AP) download status for Software-Defined Application Visibility and Control (SD-AVC), use the **show sdavc ap download status** command.

show sdavc ap download status

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Examples

The following example shows how to view the per-AP download status for SD-AVC:

```
Device# show sdavc ap download status

AP  MAC        Latest filename    Status
--------------------------------------------------
00d7.8f58.2f80    xyz          SUCCESS
00d7.8f58.2d82    abc          FAILED
```

show sdavc status ap

To view the Software-Defined Application Visibility and Control (SD-AVC) status for an access point (AP), use the **show sdavc status ap** command.

show sdavc status ap *ap-name*

Syntax Description

ap-name	AP name or MAC address.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Examples

The following example shows how to view the SD-AVC status for an AP:

```
Device# show sdavc status ap 00d7.8f58.2f80

AP MAC                Status
----------------------------------
00d7.8f58.2f80        ENABLED
```

show ssh

To see the SSH connection status, use the **show ssh** command.

show ssh {*connection-number* | {**vty** *connection-number*}}

Syntax Description	*connection-number* SSH connection number. Valid range is 0 to 530.

Command Default	None

Command Modes	Privileged EXEC

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the SSH connection status:

```
Device# show ssh connection-number
```

show split-tunnel client access-list

To verify split tunneling Domain Name System (DNS) Access Control Lists (ACLs) per wireless client, use the **show split-tunnel client access-list** command.

show split-tunnel client *mac-address* **access-list**

Syntax Description	*mac-address* Wireless client MAC address.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.1.1	This command was introduced.

Examples

The following example shows how to verify the split tunneling DNS ACLs for a wireless client:

```
Device# show split-tunnel client 00:11:22:33:44:55 access-list

Split tunnel ACLs for Client: 00:11:22:33:44:55

IP ACL: SplitTunnelACL

Tunnel packets Tunnel bytes NAT packets NAT bytes
             1          242           3       768

URL ACL: SplitTunnelACL

Tunnel packets Tunnel bytes NAT packets NAT bytes
             3          778           0         0

Resolved IPs for Client: 00:11:22:33:44:55 for Split tunnel

HIT-COUNT       URL             ACTION  IP-LIST

1               base1.com       deny.   209.165.200.224
                                        209.165.200.225

2               base2.com       deny.   209.165.200.226

3               base3.com       deny.   209.165.200.227
```

show tech-support wireless

To display Cisco wireless LAN controller variables frequently requested by Cisco Technical Assistance Center (TAC), use the **show tech-support wireless** command in privileged EXEC mode.

show tech-support wireless

Syntax Description   This command has no arguments or keywords.

Command Default   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

The following is sample output from the **show tech-support wireless** command:

```
Device# show tech-support wireless
 *** show ap capwap timers ***

Cisco AP CAPWAP timers

AP Discovery timer       : 10
AP Heart Beat timeout    : 30
Primary Discovery timer  : 120
Primed Join timeout      : 0
Fast Heartbeat           : Disabled
Fast Heartbeat timeout   : 1
*** show ap capwap retransmit ***
Global control packet retransmit interval : 3
Global control packet retransmit count : 5

AP Name                          Retransmit Interval              Retransmit Count
---------------------------------------------------------------------------------------------
TSIM_AP-2                        3                                5
TSIM_AP-3                        3                                5
*** show ap dot11 24ghz cleanair air-quality summary ***

AQ = Air Quality
DFS = Dynamic Frequency Selection

*** show ap dot11 24ghz cleanair air-quality worst ***

AQ = Air Quality
DFS = Dynamic Frequency Selection
AP Name           Channel   Avg AQ  Min AQ  Interferers  DFS
------------------------------------------------------------
                  0         0       0       0            No
*** show ap dot11 24ghz cleanair config ***

Clean Air Solution.............................. : Disabled
Air Quality Settings:
    Air Quality Reporting....................... : Disabled
    Air Quality Reporting Period (min)........... : 15
```

```
             Air Quality Alarms........................... : Enabled
             Air Quality Alarm Threshold.................. : 10
     Interference Device Settings:
         Interference Device Reporting................ : Enabled
             Bluetooth Link........................... : Enabled
             Microwave Oven........................... : Enabled
             802.11 FH................................ : Enabled
             Bluetooth Discovery...................... : Enabled
             TDD Transmitter.......................... : Enabled
             Jammer................................... : Enabled
             Continuous Transmitter................... : Enabled
             DECT-like Phone.......................... : Enabled
             Video Camera............................. : Enabled
             802.15.4................................. : Enabled
             WiFi Inverted............................ : Enabled
             WiFi Invalid Channel..................... : Enabled
             SuperAG.................................. : Enabled
             Canopy................................... : Enabled
             Microsoft Device......................... : Enabled
             WiMax Mobile............................. : Enabled
             WiMax Fixed.............................. : Enabled
         Interference Device Types Triggering Alarms:
             Bluetooth Link........................... : Disabled
             Microwave Oven........................... : Disabled
             802.11 FH................................ : Disabled
             Bluetooth Discovery...................... : Disabled
             TDD Transmitter.......................... : Disabled
             Jammer................................... : Disabled
             Continuous Transmitter................... : Disabled
             DECT-like Phone.......................... : Disabled
             Video Camera............................. : Disabled
         802.15.4................................. : Disabled
             WiFi Inverted............................ : Enabled
             WiFi Invalid Channel..................... : Enabled
             SuperAG.................................. : Disabled
             Canopy................................... : Disabled
             Microsoft Device......................... : Disabled
             WiMax Mobile............................. : Disabled
             WiMax Fixed.............................. : Disabled
         Interference Device Alarms................... : Enabled
     Additional Clean Air Settings:
         CleanAir Event-driven RRM State.............. : Disabled
         CleanAir Driven RRM Sensitivity.............. : LOW
         CleanAir Persistent Devices state............ : Disabled
```

show tech-support wireless ap

To display specific information about the Cisco APs variables frequently requested by Cisco Technical Assistance Center (TAC), use the **show tech-support wireless ap** command in privileged EXEC mode.

show tech-support wireless ap

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

The output of the following commands are displayed as part of **show tech-support wireless ap**command:

- show ap session termination statistics
- show ap status
- show ap tag summary
- show platform software bssid chassis active F0 statistics
- show platform software bssid chassis active R0 statistics
- show platform software capwap chassis active F0 statistics
- show platform software capwap chassis active R0 statistics
- show platform software dtls chassis active F0 statistics
- show platform software dtls chassis active R0 statistics
- show platform software radio chassis active F0 statistics
- show platform software radio chassis active R0 statistics

Example

The following is sample output from the **show tech-support wireless ap** command

```
Device# show tech-support wireless ap

------------------ show platform software dtls chassis active R0 statistics ------------------


DTLS Counters     (Success/Failure)
---------------------------------
Create             0/0
```

```
Delete                0/0

Switch 1:
OM Create             0/0
OM Delete             0/0
Ack Nack Notify       0/0


----------------- show platform software radio chassis active R0 statistics
-----------------



Switch 1:
NACK Notify           0/0
  Create Failure      0
  Delete Failure      0


----------------- show platform software bssid chassis active R0 statistics
-----------------



Switch 1:
NACK Notify           0/0
  Create Failure      0
  Delete Failure      0


----------------- show platform software capwap chassis active R0 statistics
-----------------



Capwap Counters   (Success/Failure)
----------------------------------
Create                0/0
Delete                0/0
Modify                0/0

Switch 1:
OM Create             0/0
OM Delete             0/0
ACK-NACK Notify       0/0
  Tunnel State        0/0
  Tunnel Create       0/0
  Tunnel Modify       0/0
  Tunnel Delete       0/0


----------------- show platform software dtls chassis active F0 statistics -----------------



DTLS Counters     (Success/Failure)
----------------------------------
Create                0/0
Delete                0/0
HW Create             0/0
HW Modify             0/0
HW Delete             0/0
Create Ack            0/0
Modify Ack            0/0
Delete Ack            0/0
Ack Ack Notify        0/0
```

```
Ack Nack Notify        0/0
Nack Notify            0/0
HA Seq GET             665/0
HA Seq SET             0/0
HA Seq Crypto GET      0/0
HA Seq Crypto SET      0/0
HA Seq Crypto Callback 0/0

HA Seq last Responsed  0
HA Seq Pending         0
HA Seq Outstanding cb  0


------------------ show platform software radio chassis active F0 statistics
------------------


Radio Counters     (Success/Failure)
-----------------------------------
Create                 0/0
Delete                 0/0
HW Create              0/0
HW Modify              0/0
HW Delete              0/0
Create Ack             0/0
Modify Ack             0/0
Delete Ack             0/0
Nack Notify            0/0


------------------ show platform software bssid chassis active F0 statistics
------------------


Bssid Counters     (Success/Failure)
-----------------------------------
Create                 0/0
Delete                 0/0
HW Create              0/0
HW Modify              0/0
HW Delete              0/0
Create Ack             0/0
Modify Ack             0/0
Delete Ack             0/0
Nack Notify            0/0


------------------ show platform software capwap chassis active F0 statistics
------------------


Capwap Counters    (Success/Failure)
-----------------------------------
Create                 0/0
Delete                 0/0
HW Create              0/0
HW Modify              0/0
HW Delete              0/0
Create Ack             0/0
Modify Ack             0/0
Delete Ack             0/0
Ack Ack Notify         0/0
Ack Nack Notify        0/0
Nack Notify            0/0
```

```
----------------- show ap auto-rf dot11 24ghz -----------------


----------------- show ap auto-rf dot11 5ghz -----------------


----------------- show ap capwap retransmit -----------------


----------------- show ap config dot11 dual-band summary -----------------


----------------- show ap config general -----------------



----------------- show ap dot11 24ghz channel -----------------


Leader Automatic Channel Assignment
  Channel Assignment Mode                 : AUTO
  Channel Update Interval                 : 600 seconds
  Anchor time (Hour of the day)           : 0
  Channel Update Contribution
    Noise                                 : Enable
    Interference                          : Enable
    Load                                  : Disable
    Device Aware                          : Disable
  CleanAir Event-driven RRM option        : Disabled
  Channel Assignment Leader               : ewlc-doc (9.12.32.10)
  Last Run                                : 25 seconds ago

  DCA Sensitivity Level                   : MEDIUM : 10 dB
  DCA Minimum Energy Limit                : -95 dBm
  Channel Energy Levels
    Minimum                               : unknown
    Average                               : unknown
    Maximum                               : -128 dBm
  Channel Dwell Times
    Minimum                               : unknown
    Average                               : unknown


----------------- show ap dot11 24ghz group -----------------


Radio RF Grouping

  802.11b Group Mode            : AUTO
  802.11b Group Update Interval : 600 seconds
  802.11b Group Leader          : ewlc-doc (9.12.32.10)
  802.11b Last Run              : 26 seconds ago


RF Group Members

Controller name                 Controller IP
```

```
                  --------------------------------------------------
                  ewlc-doc                          9.12.32.10




                  ----------------- show ap dot11 24ghz load-info -----------------




                  ----------------- show ap dot11 24ghz monitor -----------------


                  Default 802.11b AP monitoring
                    802.11b Monitor Mode                  : Enabled
                    802.11b Monitor Channels              : Country channels
                    802.11b RRM Neighbor Discover Type    : Transparent
                    802.11b AP Coverage Interval          : 180 seconds
                    802.11b AP Load Interval              : 60 seconds
                    802.11b AP Noise Interval             : 180 seconds
                    802.11b AP Signal Strength Interval   : 60 seconds
                    802.11b NDP RSSI Normalization         : Enabled


                  ----------------- show ap dot11 24ghz network -----------------



                  802.11b Network                         : Enabled
                  11gSupport                              : Enabled
                  11nSupport                              : Enabled
                  802.11b/g Operational Rates
                    802.11b 1M                            : Mandatory
                    802.11b 2M                            : Mandatory
                    802.11b 5.5M                          : Mandatory
                    802.11b 11M                           : Mandatory
                    802.11g 6M                            : Supported
                    802.11g 9M                            : Supported
                    802.11g 12M                           : Supported
                    802.11g 18M                           : Supported
                    802.11g 24M                           : Supported
                    802.11g 36M                           : Supported
                    802.11g 48M                           : Supported
                    802.11g 54M                           : Supported
                  802.11n MCS Settings:
                    MCS 0 : Supported
                    MCS 1 : Supported
                    MCS 2 : Supported
                    MCS 3 : Supported


                  ----------------- show ap dot11 24ghz profile -----------------



                  Default 802.11b AP performance profiles
                    802.11b Global Interference threshold    : 10 %
                    802.11b Global noise threshold           : -70 dBm
                    802.11b Global RF utilization threshold  : 80 %
                    802.11b Global throughput threshold      : 1000000 bps
                    802.11b Global clients threshold         : 12 clients


                  ----------------- show ap dot11 24ghz summary -----------------
```

```
------------------ show ap dot11 24ghz txpower ------------------


Automatic Transmit Power Assignment

Transmit Power Assignment Mode          : AUTO
Transmit Power Update Interval          : 600 seconds
Transmit Power Threshold                : -70 dBm
Transmit Power Neighbor Count           : 3 APs
Min Transmit Power                      : -10 dBm
Max Transmit Power                      : 30 dBm
Update Contribution
    Noise                               : Enable
    Interference                        : Enable
    Load                                : Disable
    Device Aware                        : Disable
Transmit Power Assignment Leader        : ewlc-doc (9.12.32.10)
Last Run                                : 27 seconds ago


------------------ show ap dot11 5ghz channel ------------------


Leader Automatic Channel Assignment
  Channel Assignment Mode               : AUTO
  Channel Update Interval               : 600 seconds
  Anchor time (Hour of the day)         : 0
  Channel Update Contribution
    Noise                               : Enable
    Interference                        : Enable
    Load                                : Disable
    Device Aware                        : Disable
  CleanAir Event-driven RRM option      : Disabled
  Channel Assignment Leader             : ewlc-doc (9.12.32.10)
  Last Run                              : 27 seconds ago

  DCA Sensitivity Level                 : MEDIUM : 15 dB
  DCA 802.11n/ac Channel Width          : 20 MHz
  DCA Minimum Energy Limit              : -95 dBm
  Channel Energy Levels
    Minimum                             : unknown
    Average                             : unknown
    Maximum                             : -128 dBm
  Channel Dwell Times
    Minimum                             : unknown


------------------ show ap dot11 5ghz group ------------------


Radio RF Grouping

  802.11a Group Mode                : AUTO
  802.11a Group Update Interval     : 600 seconds
  802.11a Group Leader              : ewlc-doc (9.12.32.10)
  802.11a Last Run                  : 28 seconds ago


RF Group Members

Controller name                 Controller IP
```

```
                   -------------------------------------------------
                   ewlc-doc                        9.12.32.10




                   ----------------- show ap dot11 5ghz load-info ------------------




                   ----------------- show ap dot11 5ghz monitor ------------------


Default 802.11a AP monitoring
  802.11a Monitor Mode                 : Enabled
  802.11a Monitor Channels             : Country channels
  802.11a RRM Neighbor Discover Type   : Transparent
  802.11a AP Coverage Interval         : 180 seconds
  802.11a AP Load Interval             : 60 seconds
  802.11a AP Noise Interval            : 180 seconds
  802.11a AP Signal Strength Interval  : 60 seconds
  802.11a NDP RSSI Normalization       : Enabled


----------------- show ap dot11 5ghz network ------------------



802.11a Network                        : Enabled
11nSupport                             : Enabled
  802.11a Low Band                     : Enabled
  802.11a Mid Band                     : Enabled
  802.11a High Band                    : Enabled
802.11a Operational Rates
  802.11a 6M                           : Mandatory
  802.11a 9M                           : Supported
  802.11a 12M                          : Mandatory
  802.11a 18M                          : Supported
  802.11a 24M                          : Mandatory
  802.11a 36M                          : Supported
  802.11a 48M                          : Supported
  802.11a 54M                          : Supported
802.11n MCS Settings:
  MCS 0 : Supported
  MCS 1 : Supported
  MCS 2 : Supported
  MCS 3 : Supported
  MCS 4 : Supported
  MCS 5 : Supported


----------------- show ap dot11 5ghz profile ------------------


Default 802.11a AP performance profiles

  802.11a Global Interference threshold        : 10 %
  802.11a Global noise threshold               : -70 dBm
  802.11a Global RF utilization threshold      : 80 %
  802.11a Global throughput threshold          : 1000000 bps
  802.11a Global clients threshold             : 12 clients


----------------- show ap dot11 5ghz summary ------------------
```

```
----------------- show ap dot11 5ghz txpower -----------------


Automatic Transmit Power Assignment

Transmit Power Assignment Mode          : AUTO
Transmit Power Update Interval          : 600 seconds
Transmit Power Threshold                : -70 dBm
Transmit Power Neighbor Count           : 3 APs
Min Transmit Power                      : -10 dBm
Max Transmit Power                      : 30 dBm
Update Contribution
    Noise                               : Enable
    Interference                        : Enable
    Load                                : Disable
    Device Aware                        : Disable
Transmit Power Assignment Leader        : ewlc-doc (9.12.32.10)
Last Run                                : 28 seconds ago


----------------- show ap image -----------------




----------------- show wireless stats ap join summary -----------------

Number of APs: 0

Base MAC        Ethernet MAC    AP Name                         IP Address      Status
      Last Failure Type    Last Disconnect Reason
----------------------------------------------------------------------------------------


----------------- show ap rf-profile summary -----------------



Number of RF-profiles: 6

RF Profile Name              Band      Description                              State
----------------------------------------------------------------------------------------
Low_Client_Density_rf_5gh    5 GHz     pre configured Low Client Density rf  Up
High_Client_Density_rf_5gh   5 GHz     pre configured High Client Density r  Up
Low_Client_Density_rf_24gh   2.4 GHz   pre configured Low Client Density rf  Up
High_Client_Density_rf_24gh  2.4 GHz   pre configured High Client Density r  Up
Typical_Client_Density_rf_5gh    5 GHz     pre configured Typical Density rfpro  Up
Typical_Client_Density_rf_24gh   2.4 GHz   pre configured Typical Client Densit  Up


----------------- show ap slots -----------------



----------------- show ap summary -----------------



Number of APs: 0
```

```
----------------- show ap uptime ------------------


Number of APs: 0



----------------- show ap tag summary ------------------


Number of APs: 0



----------------- show ap status ------------------



----------------- show ap cdp neighbors ------------------


Number of neighbors: 0



----------------- show ap ap-join-profile summary ------------------


Number of AP Profiles: 1
AP Profile Name                     Description
---------------------------------------------------------------------
default-ap-profile                  default ap profile


----------------- show ap link-encryption ------------------



----------------- show wireless stats ap session termination ------------------



----------------- show wireless loadbalance ap affinity wncd 0 ------------------



----------------- show wireless loadbalance ap affinity wncd 1 ------------------



----------------- show wireless loadbalance ap affinity wncd 2 ------------------



----------------- show wireless loadbalance ap affinity wncd 3 ------------------



----------------- show wireless loadbalance ap affinity wncd 4 ------------------



----------------- show wireless loadbalance ap affinity wncd 5 ------------------
```

```
----------------- show wireless loadbalance ap affinity wncd 6 -----------------


----------------- show wireless loadbalance ap affinity wncd 7 -----------------
```

show tech-support wireless client

To print the data related to all clients or a particular client, use the **show tech-support wireless client** command in privileged EXEC mode.

show tech-support wireless client

Syntax Description	**mac-address**	Client MAC address.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The output of the following commands are displayed as part of **show tech-support wireless client** command:

- show platform software wireless-client chassis active F0 statistics
- show platform software wireless-client chassis active R0 statistics
- show wireless client calls active
- show wireless client calls rejected
- show wireless client client-statistics summary
- show wireless client device summary
- show wireless client mac <mac-addr> details
- show wireless client probing
- show wireless client sleeping-client
- show wireless client statistic
- show wireless client steering
- show wireless client summary
- show wireless exclusionlist
- show wireless pmk-cache

> **Note**   The **show tech-support wireless client** command does not display the output of **show wireless client summary detail** command.

Example

The following is sample output from the **show tech-support wireless client** command

```
Device# show tech-support wireless client

----------------- show wireless stats client summary -----------------

Number of Local Clients : 0


MAC Address     AP Name                            WLAN UpTime(secs) Rx Pkts Tx Pkts RSSI SNR
  Data Retries
-------------------------------------------------------------------------------------------------




----------------- show wireless client summary -----------------

Number of Local Clients: 0


Number of Excluded Clients: 0



----------------- show wireless client device summary -----------------



----------------- show wireless client steering -----------------


Client Steering Configuration Information
  Macro to micro transition threshold                 : -55 dBm
  Micro to Macro transition threshold                 : -65 dBm
  Micro-Macro transition minimum client count         : 3
  Micro-Macro transition client balancing window      : 3
  Probe suppression mode                              : Disabled
  Probe suppression validity window                   : 100 s
  Probe suppression aggregate window                  : 200 ms
  Probe suppression transition aggressiveness         : 3
  Probe suppression hysteresis                        : -6 dBm

WLAN Configuration Information



----------------- show wireless client calls active -----------------



----------------- show wireless client calls rejected -----------------



----------------- show wireless client sleeping-client -----------------

Total number of sleeping-client entries: 0
```

```
----------------- show wireless client probing -----------------


----------------- show wireless client ap dot11 24ghz -----------------


----------------- show wireless client ap dot11 5ghz -----------------


----------------- show wireless pmk-cache -----------------


Number of PMK caches in total : 0

Type      Station             Entry Lifetime  VLAN Override        IP Override
Audit-Session-Id
--------------------------------------------------------------------------------------------


----------------- show wireless exclusionlist -----------------


----------------- show wireless country  configured -----------------


Configured Country..........................   US - United States
Configured Country Codes
       US  - United States              802.11a Indoor/ 802.11b Indoor/ 802.11g Indoor


----------------- show wireless tag rf summary -----------------


Number of RF Tags: 1

RF tag name                     Description
----------------------------------------------------------------------
default-rf-tag                  default RF tag


----------------- show platform software wireless-client chassis active R0 statistics
-----------------


Client Counters   (Success/Failure)
---------------------------------
Create               0/0
Delete               0/0
Modify               0/0

Switch 1:
OM Create            0/0
OM Delete            0/0
```

```
NACK Notify              0/0
  Create Failure         0
  Modify Failure         0
  Delete Failure         0


----------------- show platform software wireless-client chassis active F0 statistics
-----------------


Client Counters   (Success/Failure)
-----------------------------------
Create                   0/0
Delete                   0/0
HW Create                0/0
HW Modify                0/0
HW Delete                0/0
Create Ack               0/0
Modify Ack               0/0
Delete Ack               0/0
NACK Notify              0/0


----------------- show platform hardware chassis active qfp feature wireless wlclient
cpp-client summary -----------------


----------------- show platform hardware chassis active qfp feature wireless wlclient
datapath summary -----------------


Vlan   pal_if_hdl   mac            Input Uidb Output Uidb
------ ------------ -------------- ---------- -----------
```

show tech-support wireless datapath

To print the data related to CPP datapath, use the **show tech-support wireless datapath** command in privileged EXEC mode.

show tech-support wireless datapath

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines This command is available only on the platforms that have CPP datapath architecture, such as Cisco vEWLC, Cisco 9540 WLC, and Cisco 9880 WLC.

The output of the following commands are displayed as part of **show tech-support wireless datapath** command:

- show platform hardware chassis active qfp feature wireless bssid summary
- show platform hardware chassis active qfp feature wireless capwap cpp-client statistics
- show platform hardware chassis active qfp feature wireless capwap cpp-client summary
- show platform hardware chassis active qfp feature wireless capwap datapath statistics drop
- show platform hardware chassis active qfp feature wireless capwap datapath statistics fragmentation
- show platform hardware chassis active qfp feature wireless capwap datapath statistics reassembly
- show platform hardware chassis active qfp feature wireless capwap datapath summary
- show platform hardware chassis active qfp feature wireless dtls cpp-client statistics
- show platform hardware chassis active qfp feature wireless dtls cpp-client summary
- show platform hardware chassis active qfp feature wireless dtls datapath statistics
- show platform hardware chassis active qfp feature wireless dtls datapath summary
- show platform hardware chassis active qfp feature wireless et-analytics eta-pending-client-tree
- show platform hardware chassis active qfp feature wireless et-analytics statistics
- show platform hardware chassis active qfp feature wireless fqdn-filter summary
- show platform hardware chassis active qfp feature wireless halo statistics
- show platform hardware chassis active qfp feature wireless ipsg cpp-client statistics

- show platform hardware chassis active qfp feature wireless ipsg cpp-client table ipv4 all

- show platform hardware chassis active qfp feature wireless ipsg cpp-client table ipv6 all

- show platform hardware chassis active qfp feature wireless ipsg datapath statistics global

- show platform hardware chassis active qfp feature wireless ipsg datapath table ipv4 all

- show platform hardware chassis active qfp feature wireless ipsg datapath table ipv6 all

- show platform hardware chassis active qfp feature wireless mgmt-intf cpp-client summary

- show platform hardware chassis active qfp feature wireless mgmt-intf datapath summary

- show platform hardware chassis active qfp feature wireless punt statistics

- show platform hardware chassis active qfp feature wireless wlan summary

- show platform hardware chassis active qfp feature wireless wlclient cpp-client statistics

- show platform hardware chassis active qfp feature wireless wlclient cpp-client summary

- show platform hardware chassis active qfp feature wireless wlclient datapath statistic drop

- show platform hardware chassis active qfp feature wireless wlclient datapath summary

- show platform hardware chassis active qfp feature wireless wlclient datapath table dataglean all

- show platform hardware chassis active qfp infrastructure punt statistics type per-cause

- show platform hardware chassis active qfp statistics drop

- show platform software bssid chassis active F0

- show platform software bssid chassis active F0 statistics

- show platform software capwap chassis active F0

- show platform software capwap chassis active F0 statistics

- show platform software dtls chassis active F0

- show platform software dtls chassis active F0 statistics

- show platform software wireless-client chassis active F0

- show platform software wireless-client chassis active F0 statistics

- show platform software wlan chassis active F0

In the presence of standby node, the following datapath commands are also displayed:

- show platform hardware chassis standby qfp feature wireless bssid summary

- show platform hardware chassis standby qfp feature wireless capwap cpp-client statistics

- show platform hardware chassis standby qfp feature wireless capwap cpp-client summary

- show platform hardware chassis standby qfp feature wireless capwap datapath statistics drop

- show platform hardware chassis standby qfp feature wireless capwap datapath statistics fragmentation

- show platform hardware chassis standby qfp feature wireless capwap datapath statistics reassembly

- show platform hardware chassis standby qfp feature wireless capwap datapath summary
- show platform hardware chassis standby qfp feature wireless dtls cpp-client statistics
- show platform hardware chassis standby qfp feature wireless dtls cpp-client summary
- show platform hardware chassis standby qfp feature wireless dtls datapath statistics
- show platform hardware chassis standby qfp feature wireless dtls datapath summary
- show platform hardware chassis standby qfp feature wireless halo statistics
- show platform hardware chassis standby qfp feature wireless ipsg cpp-client statistics
- show platform hardware chassis standby qfp feature wireless ipsg cpp-client table ipv4 all
- show platform hardware chassis standby qfp feature wireless ipsg cpp-client table ipv6 all
- show platform hardware chassis standby qfp feature wireless ipsg datapath statistics global
- show platform hardware chassis standby qfp feature wireless ipsg datapath table ipv4 all
- show platform hardware chassis standby qfp feature wireless ipsg datapath table ipv6 all
- show platform hardware chassis standby qfp feature wireless mgmt-intf cpp-client summary
- show platform hardware chassis standby qfp feature wireless mgmt-intf datapath summary
- show platform hardware chassis standby qfp feature wireless punt statistics
- show platform hardware chassis standby qfp feature wireless wlan summary
- show platform hardware chassis standby qfp feature wireless wlclient cpp-client statistics
- show platform hardware chassis standby qfp feature wireless wlclient cpp-client summary
- show platform hardware chassis standby qfp feature wireless wlclient datapath statistic drop
- show platform hardware chassis standby qfp feature wireless wlclient datapath summary
- show platform hardware chassis standby qfp feature wireless wlclient datapath table dataglean all
- show platform hardware chassis standby qfp statistics drop
- show platform software bssid chassis standby F0
- show platform software bssid chassis standby F0 statistics
- show platform software capwap chassis standby F0
- show platform software capwap chassis standby F0 statistics
- show platform software dtls chassis standby F0
- show platform software dtls chassis standby F0 statistics
- show platform software wireless-client chassis standby F0
- show platform software wireless-client chassis standby F0 statistics
- show platform software wlan chassis standby F0

Example

The following is sample output from the **show tech-support wireless datapath** command

```
Device# show tech-support wireless datapath


------------------ show platform hardware chassis active qfp statistics drop
------------------


--------------------------------------------------------------------------
Global Drop Stats                         Packets              Octets
--------------------------------------------------------------------------
Disabled                                    22230             2045194
InvL2Hdr                                   4765368           744492240
Ipv4NoAdj                                         6                 736
Ipv4NoRoute                                      18                2358
Ipv6mcNoRoute                                     3                 270
SWPortDrop                                    14432             2886027
SWPortSrcFilter                               53265            53992718
SWPortStpState                                42041             3269790
SWPortVlanNotCfg                            5515542           674079804
SwitchL2m                                        78               10062
SwitchL2mIGMP                                 18866             1283348
SwitchL2mUnconfigWireless                        78               11622
WlsCapwapNoTunnel                                 3                 627


------------------ show platform hardware chassis active qfp feature wireless punt statistics
 ------------------


CPP Wireless Punt stats:

                                 App Tag     Packet Count
                                 -------     ------------
          CAPWAP_PKT_TYPE_DOT11_PROBE_REQ               0
                CAPWAP_PKT_TYPE_DOT11_MGMT              56
                CAPWAP_PKT_TYPE_DOT11_IAPP           22177
                CAPWAP_PKT_TYPE_DOT11_RFID               0
                 CAPWAP_PKT_TYPE_DOT11_RRM               0
               CAPWAP_PKT_TYPE_DOT11_DOT1X               0
            CAPWAP_PKT_TYPE_CAPWAP_KEEPALIVE             0
          CAPWAP_PKT_TYPE_MOBILITY_KEEPALIVE             0
               CAPWAP_PKT_TYPE_CAPWAP_CNTRL        303661
                CAPWAP_PKT_TYPE_CAPWAP_DATA               0
            CAPWAP_PKT_TYPE_MOBILITY_CNTRL               0
                         WLS_SMD_WEBAUTH               0
                       SISF_PKT_TYPE_ARP             303
                      SISF_PKT_TYPE_DHCP             282
                     SISF_PKT_TYPE_DHCP6               0
                   SISF_PKT_TYPE_IPV6_ND               0
                 SISF_PKT_TYPE_DATA_GLEAN               0
              SISF_PKT_TYPE_DATA_GLEAN_V6               0
                 SISF_PKT_TYPE_DHCP_RELAY               0
           CAPWAP_PKT_TYPE_CAPWAP_RESERVED               0


------------------ show platform hardware chassis active qfp infrastructure punt statistics
 type per-cause ------------------

Global Per Cause Statistics
```

```
        Number of punt causes =   136

        Per Punt Cause Statistics
                                                  Packets                 Packets
        Counter ID   Punt Cause Name              Received                Transmitted


        -------------------------------------------------------------------------------------

        000          Reserved                     0                       0

        001          MPLS ICMP Can't Fragment     0                       0

        002          IPv4 Options                 0                       0

        003          Layer2 control and legacy    0                       0

        004          PPP Control                  0                       0

        005          CLNS IS-IS Control           0                       0

        006          HDLC keepalives              0                       0

        007          ARP request or response      2687                    2687

        008          Reverse ARP request or repsonse  0                   0

        009          Frame-relay LMI Control      0                       0

        010          Incomplete adjacency         0                       0

        011          For-us data                  0                       0

        012          Mcast Directly Connected Source  0                   0

        013          Mcast IPv4 Options data packet   0                   0

        014          Skip egress processing       0                       0

        015          MPLS TTL expired             0                       0

        016          MPLS Reserved label (ie: 0-15)   0                   0

        017          IPv6 Bad hop limit           0                       0

        018          IPV6 Hop-by-hop Options      0                       0

        019          Mcast Internal Copy          0                       0

        020          Generic QFP generated packet 0                       0

        021          RP<->QFP keepalive           46691                   46691

        022          QFP Fwall generated packet   0                       0

        023          Mcast IGMP Unroutable        0                       0

        024          Glean adjacency              2557                    2556

        025          Mcast PIM signaling          0                       0

        026          QFP ICMP generated packet    0                       0

        027          Subscriber session control   0                       0
```

028	Subscriber data switching back	0	0
029	RP handled ICMP	0	0
030	RP injected For-us data	0	0
031	Punt adjacency	0	0
032	SBC RTP DTMF	0	0
033	Pseudowire VCCV control channel	0	0
034	Generic QFP generated packet (keep GPM)	0	0
035	Ethernet slow protocol (ie: LACP, OAM)	0	0
036	Ethernet OAM Loopback	0	0
037	UNUSED	0	0
038	SPA IPC packet	0	0
039	Punt and replicate	0	0
040	PPPoE control	0	0
041	PPPoE session	0	0
042	L2TP control	0	0
043	IP Subscriber control (ie: FSOL, keepali	0	0
044	L2TP session	0	0
045	BFD control	0	0
046	MVPN non-RPF signaling packet	0	0
047	MVPN PIM signalling packet	0	0
048	Mcast punt to RP	0	0
049	SBC generated packet	0	0
050	IPv6 packet	0	0
051	DMVPN NHRP redirect	0	0
052	PFR monitored prefix logging	0	0
053	PFR top talkers logging	0	0
054	PFR top talkers application logging	0	0
055	For-us control	0	0
056	RP injected for-us control	0	0
057	QFP VTCP generated packet	0	0
058	Layer2 bridge domain data packet	0	0
059	QFP Stile generated packet	0	0

060	IP subnet or broadcast packet	167	167
061	Ethernet CFM packet	0	0
062	Ethernet CFM notify packet	0	0
063	LISP LSB NOTIFICATION	0	0
064	Service Engine packet	0	0
065	L2BD Control packet from FIA	0	0
066	L2BD Control Message from CPP	0	0
067	MFR_LIP_CONTROL	0	0
068	Media Monitoring record punted from CPP	0	0
069	OTV Control packet	0	0
070	OTV ARP packet	0	0
071	REP control	0	0
072	IP MTU EXCEPTION	0	0
073	STP BPDU's	186832	186832
074	ACL log	0	0
075	EPC	0	0
076	Lisp Dynamic eid	0	0
077	L2 Control packet	122389	122389
078	WAAS CPP to CPP punt	0	0
079	dhcp snoop	0	0
080	Metric Mediation Agent record punted fro	0	0
081	IPv6 DMVPN NHRP redirect	0	0
082	Ethernet CFM packet from core	0	0
083	Ethernet CFM punt fwd packet	0	0
084	PTP punt fwd packet	0	0
085	ISDN D-Channel raw packet	0	0
086	Service controller SCG punt pkt	0	0
087	IPv6 FHS SG dropped packet	0	0
088	IPv6 FHS Data glean packet	0	0
089	SBC DSP pkts	0	0
090	Raw Socket Data packet	0	0
091	SSLVPN session control	0	0

092	ICMP unreachables for ACL denied packets	0	0
093	CENT Smart Probe packet	0	0
094	AppNav vPATH pktless API generated pkt	0	0
095	Autonomic Network Channel Discovery pack	0	0
096	Layer2 control protocols	0	0
097	Packets to LFTS	22177	22177
098	VLAN Auto Sense FSOL	0	0
099	ZTP Discovery packet	0	0
100	cable arp filter	0	0
101	Cable L3 mobility	0	0
102	Source Verify inconclusive	0	0
103	cable modem pre reg	0	0
104	mpls receive adj	0	0
105	MKA EAPoL packet	0	0
106	ICMP Unreachable	0	0
107	Cable DHCP	0	0
108	Snooping packet	0	0
109	snoop packets	0	0
110	msg Indicating ppp intf assigned ip addr	0	0
111	msg indicating there is another common h	0	0
112	QoS CAC Flow Report	0	0
113	Active identity	0	0
114	BGP Overlay Tunnel packet	0	0
115	Lisp gsmr enabled	0	0
116	Async TS	0	0
117	Metric Mediation Agent Packet	0	0
118	Cable DHCPV6 Solicit	0	0
119	Cable DHCPV6 Request	0	0
120	SBC RTP FWD DTMF	0	0
121	Path Manager	0	0
122	L2 LISP VXLAN	0	0
123	dialer-list	0	0

124	Dialer update time	0	0
125	Cable RPHY CTRL	0	0
126	OpenFlow SDN	0	0
127	Path Manager TTL expired	0	0
128	L3 PTP message	0	0
129	wls 802.11 Packets to LFTS	56	56
130	wls CAPWAP Packets to LFTS	303661	303661
131	wls MOBILITY Packets to LFTS	0	0
132	wls SISF Packets to LFTS	585	585
133	cable DHCPv6 subscriber-side	0	0
134	cable DHCPv4 subscriber-side	0	0
135	cable DHCPv4 sub-side disc/req	0	0

```
Number of inject causes = 49
Per Inject Cause Statistics
```

Counter ID	Inject Cause Name	Packets Received	Packets Transmitted
000	RESERVED	0	0
001	L2 control/legacy	3115	3115
002	QFP destination lookup	0	0
003	QFP IPv4/v6 nexthop lookup	0	0
004	QFP generated packet	0	0
005	QFP <->RP keepalive	46691	0
006	QFP Fwall generated packet	0	0
007	QFP adjacency-id lookup	0	0
008	Mcast specific inject packet	0	0
009	QFP ICMP generated packet	0	0
010	QFP/RP->QFP Subscriber data packet	0	0
011	SBC DTMF	0	0
012	ARP request or response	3637	3637
013	Ethernet OAM loopback packet	0	0

014	UNUSED	0	0
015	PPPoE discovery packet	0	0
016	PPPoE session packet	0	0
017	QFP inject for pp_index lookup	0	0
018	QFP inject replicate	0	0
019	QFP inject PIT lookup	0	0
020	SBC generated packets	0	0
021	QFP VTCP generated packet	0	0
022	QFP Stile generated packet	0	0
023	Service Engine generated packet	0	0
024	Layer2 frame to EFP	0	0
025	Layer2 frame to BD	0	0
026	QfP Asym Routing redirected pkt	0	0
027	Compressed packet from WAAS	0	0
028	Media (e.g. voice) associated with a ses	0	0
029	service controller scg packet	0	0
030	Packet for 14 port Serial IM	0	0
031	Subscriber generated TCP reset packet	0	0
032	Layer2 frame to INPUT EFP	0	0
033	SSLVPN inject control	0	0
034	injected packet from UTD SP	0	0
035	injected packet from DPSS SN	0	0
036	injected packet by AppNav vPath	0	0
037	Uncompressed packet from WAAS	0	0
038	Autonomic Network Channel Discovery pack	0	0
039	Cable Bundle Flood Inject	0	0
040	Cable L2 unicast inject	0	0
041	downstream jib packet	0	0
042	switch port layer 2 control packet	6254	6253
043	Applications Injecting Pkts using LFTS	303874	303269
044	Enhanced ping and traceroute	0	0
045	Applications Injecting packets with SGT	0	0

```
046          CoPP packets from EPC_WS                    0                    0

047          Async TS                                    0                    0

048          Layer2 frame to VLAN                        0                    0
```

----------------- show platform hardware chassis active qfp feature wireless mgmt-intf cpp-client summary -----------------

```
Wireless Management Interface Info
 CPP IF_H   VLAN   MAC Address
---------------------------------
   0XF      78    001e.1405.2bff
```

----------------- show platform hardware chassis active qfp feature wireless mgmt-intf datapath summary -----------------

```
Wireless Management Interface Info
IF_H       VLAN   MAC Address
------------------------------------
0xF        78     001e.1405.2bff
```

----------------- show platform software wlan chassis active F0 -----------------

```
WLAN Interface ID  WLAN ID    WLAN Name                               AOM ID  Status
-----------------------------------------------------------------------------------------------
0xf0400001         1          att                                     275  Done

0xf0400002         2          verizon                                 292  Done
```

----------------- show platform hardware chassis active qfp feature wireless wlan summary -----------------

```
CPP Wlan Database Summary
Total number of wlan interfaces : 2
        if_name            cpp_if_hdl   pal_if_hdl    in_uidb      out_uidb
        ssid
-------------------------------------------------------------------------------------------------------
   WLAN-IF-0x00f0400001     0X74       0XF0400001    0X1768E      0X1768C
        att
   WLAN-IF-0x00f0400002     0X78       0XF0400002    0X1768A      0X17688
      verizon
```

----------------- show platform software bssid chassis active F0 statistics -----------------

```
Bssid Counters    (Success/Failure)
---------------------------------
Create             0/0
Delete             0/0
HW Create          0/0
```

```
HW Modify              0/0
HW Delete              0/0
Create Ack             0/0
Modify Ack             0/0
Delete Ack             0/0
Nack Notify            0/0


----------------- show platform software bssid chassis active F0 -----------------



----------------- show platform hardware chassis active qfp feature wireless bssid summary
 -----------------



----------------- show platform software capwap chassis active F0 statistics
-----------------


Capwap Counters   (Success/Failure)
----------------------------------
Create                 424/0
Delete                 420/0
HW Create              424/0
HW Modify              0/0
HW Delete              420/0
Create Ack             424/0
Modify Ack             0/0
Delete Ack             420/0
Ack Ack Notify         0/0
Ack Nack Notify        0/0
Nack Notify            0/0


----------------- show platform software capwap chassis active F0 -----------------


 Tunnel ID  AP MAC          Type          IP            Port      AOM ID  Status

------------------------------------------------------------------------------------------------

0x90000042  00a8.2200.0200  Data          78.1.50.1     52345       3271  Done

0xa0000002  0000.0000.0000  Mobility Data 78.1.1.23     16667       1426  Done

0xa0000003  0000.0000.0000  Mobility Data 78.1.1.24     16667       1427  Done

0xa0000004  0000.0000.0000  Mobility Data 78.1.1.25     16667       1428  Done



----------------- show platform hardware chassis active qfp feature wireless capwap
cpp-client statistics -----------------


CAPWAP cpp-client plumbing statistics
Number Msg in = ack + nak + ack fail + nak fail + errors

Counter                                       Value
-------------------------------------------------------------
Create from fp                                424
```

```
Modify from fp                                      0
Delete from fp                                      420
Create ack to fp                                    424
Create ack fail to fp                               0
Create nack to fp                                   0
Create nack fail to fp                              0
Modify ack to fp                                    0
Modify ack fail to fp                               0
Modify nack to fp                                   0
Modify nack fail to fp                              0
Delete ack to fp                                    420
Delete ack fail to fp                               0
Delete nack to fp                                   0
Delete nak fail to fp                               0
```

```
----------------- show platform hardware chassis active qfp feature wireless capwap
cpp-client summary ------------------

 cpp_if_hdl    pal_if_hdl     AP MAC          Src IP          Dst IP        Dst Port
Tun Type
-----------------------------------------------------------------------------------------
   0X108       0X90000042    00a8.2200.0200   78.1.1.7        78.1.50.1      52345
  DATA
   0X10B       0XA0000002    0000.0000.0000   78.1.1.7        78.1.1.23      16667
MOBILITY
   0X10C       0XA0000003    0000.0000.0000   78.1.1.7        78.1.1.24      16667
MOBILITY
   0X10D       0XA0000004    0000.0000.0000   78.1.1.7        78.1.1.25      16667
MOBILITY
```

```
----------------- show platform hardware chassis active qfp feature wireless capwap datapath
 summary ------------------

Vrf Src Port Dst IP          Dsp Port Input Uidb Output Uidb Instance Id
--- -------- ------          -------- ---------- ----------- -----------
0   16667    78.1.1.25       16667    95733      95731       0
0   5247     78.1.50.1       52345    95738      95736       3
0   16667    78.1.1.24       16667    95734      95732       0
0   16667    78.1.1.23       16667    95735      95733       0
```

```
----------------- show platform hardware chassis active qfp feature wireless capwap datapath
 statistics drop ------------------


Drop Cause                                                          Packets
      Octets
================================================================================
====================
Wls Capwap unsupported link type Error                                 0
          0
Wls Capwap invalid tunnel Error                                        0
          0
Wls Capwap input config missing Error                                  0
          0
Wls Capwap invalid TPID Error                                          0
          0
Wls Capwap ingress parsing Error                                       0
          0
```

```
Wls Capwap invalid FC subtype Error                                        0
          0
Wls Capwap SNAP Invalid HLEN Error                                         0
          0
Wls Client V6 Max Address Error                                            0
          0
```

```
------------------ show platform hardware chassis active qfp feature wireless capwap datapath
 statistics fragmentation ------------------
```

CPP Wireless Fragmentation stats:

Description	Packet Count	Octet Count
Capwap Packets to be Fragmented (RX)	0	0
Capwap Fragments to be Recycled	0	0
Capwap Fragments Recycled (TX)	0	0
Error: Original Packet Too Big	0	0
Error: CAPWAP MTU Not Valid	0	0
Error: Recycle Queue Full	0	0
Error: Recycle Queue Not Valid	0	0
Error: GPM Memory Init Failure	0	0
Error: Multipass Requeue Failure	0	0

```
------------------ show platform hardware chassis active qfp feature wireless capwap datapath
 statistics reassembly ------------------
```

CPP Wireless Reassembly Memory stats:

Description	Count
Free info chunk	32768
Allocated info chunks	32768
Free fragment chunks	131072
Allocated fragment chunks	131072

CPP Wireless Reassembly Packet stats: (outstanding pkt_cnt 0)

Description	Packet Count	Octet Count
Capwap Reassembled Packets	0	0
Capwap Fragments Received	0	0
Capwap Fragments Consumed (Saved)	0	0
Capwap Fragments Dropped	0	0
Capwap Reassembly Timeouts	0	0
Error - Early-drop fragments	0	0
Error - Invalid packet size	0	0
Error - Fragment size too big	0	0
Error - Too many fragments	0	0
Error - Overlap offset fragments	0	0
Error - Duplicated fragments	0	0
Error - Allocate info chunk memory	0	0
Error - Allocate frag chunk memory	0	0
Error - Hash bucket threshold	0	0
Error - Cannot save and gather pkts	0	0
Error - Get recycle reass_info NULL	0	0
Error - BQS memory alloc NULL	0	0
Error - BQS memory free NULL	0	0

```
         DEBUG - # of lock sync aquired              2              2
         DEBUG - # of lock released                 2              2
         DEBUG - CPP_CW_BQS_MX_ALLOC #              0              0
         DEBUG - CPP_CW_BQS_MX_FREE  #              0              0
         DEBUG - CPP_REASS_INFO_ALLOC #             0              0
         DEBUG - CPP_REASS_INFO_FREE  #             0              0
         DEBUG - CPP_REASS_FRAG_ALLOC #             0              0
         DEBUG - CPP_REASS_FRAG_FREE  #             0              0


----------------- show platform software dtls chassis active F0 statistics -----------------


DTLS Counters      (Success/Failure)
---------------------------------
Create             847/0
Delete             424/0
HW Create          425/0
HW Modify          422/0
HW Delete          424/0
Create Ack         425/0
Modify Ack         422/0
Delete Ack         424/0
Ack Ack Notify     1271/0
Ack Nack Notify    0/0
Nack Notify        0/0
HA Seq GET         782/0
HA Seq SET         0/0
HA Seq Crypto GET  1542/0
HA Seq Crypto SET  0/0
HA Seq Crypto Callback  1542/0

HA Seq last Responsed   0
HA Seq Pending          0
HA Seq Outstanding cb   0
Total DTLS CTX count    1


----------------- show platform software dtls chassis active F0 -----------------


Forwarding Manager DTLS Session Summary

Session ID          Type        Peer IP        Port   AOM ID     Status

---------------------------------------------------------------------------------------------

0x0300000000000001  AP Control  78.1.50.1      52345  3270       Done




----------------- show platform hardware chassis active qfp feature wireless dtls cpp-client
 statistics -----------------


DTLS cpp-client plumbing statistics
Number Msg in = ack + nak + ack fail + nak fail + errors

Counter                                  Value
------------------------------------------------------------------
Create from fp                           425
Modify from fp                           422
Delete from fp                           424
```

```
Create ack to fp                               425
Create ack fail to fp                          0
Create nack to fp                              0
Create nack fail to fp                         0
Modify ack to fp                               422
Modify ack fail to fp                          0
Modify nack to fp                              0
Modify nack fail to fp                         0
Delete ack to fp                               424
Delete ack fail to fp                          0
Delete nack to fp                              0
Delete nak fail to fp                          0



----------------- show platform hardware chassis active qfp feature wireless dtls cpp-client
 summary -----------------

     Session ID          CDH Handle      Session Type    Parent if-h       Instance id

------------------------------------------------------------------------------------------------

0x0300000000000001  0x00000000D902D9E0   AP Control           0                   3



----------------- show platform hardware chassis active qfp feature wireless dtls datapath
 summary -----------------


Src IP          Dst IP          Src Port Dst Port  Crypto HDL       Instance Id
------          ------          -------- -------   -----------      ----------
78.1.1.7        78.1.50.1       5246     52345     0xd902d9e0       3

----------------- show platform hardware chassis active qfp feature wireless dtls datapath
 statistics -----------------


CPP Wireless DTLS Feature Stats

                                 Description    Packet Count     Octet Count
                                 -----------    ------------     -----------
    DTLS Packets To Encrypt                        286494           8860778
    DTLS Packets Encrypted                         286494          35681366
    DTLS Packets To Decrypt                        286734          41001830
    DTLS Packets Decrypted                         286734          33401602
    Skip Encryption - Handshake                         0                0
    Skip Encryption - Not AppData                       0                0
    Skip Encryption - No Hash Entry                     0                0
    Skip Encryption - No Crypto Handle                  0                0
    Skip Encryption - No DTLS header                  563            76419
    Skip Encryption - Requested by RP               16234          5042852
    Skip Decryption - Handshake                         0                0
    Skip Decryption - Not AppData                    2949           996248
    Skip Decryption - No Hash Entry                   447            56474
    Skip Decryption - No Crypto Handle              13024          3626640
    Skip Decryption - No DTLS header                  507           116600
    Skip Decryption - Multiple Records                  0                0
    Error - Encrypt Invalid Length                      0                0
    Error - Encrypt Header Restore                      0                0
    Error - DataEncrypt No Crypto Handle                0                0
    Error - DataEncrypt Header Restore                  0                0
    Error - Decrypt Invalid Length                      0                0
    Error - Decrypt Header Restore                      0                0
    Error - DataDecrypt Zero Epoch                      0                0
```

```
          Error - DataDecrypt No Hash Entry                     0               0
          Error - DataDecrypt No Crypto Handle                 0               0
          Error - DataDecrypt Header Restore                   0               0


----------------- show platform software wireless-client chassis active F0 statistics
------------------


Client Counters   (Success/Failure)
---------------------------------
Create              112/0
Delete              55/0
HW Create           56/0
HW Modify           56/0
HW Delete           55/0
Create Ack          56/0
Modify Ack          56/0
Delete Ack          55/0
NACK Notify         0/0


----------------- show platform software wireless-client chassis active F0 -----------------


        ID  MAC Address     WLAN  Client State          AOM ID  Status
----------------------------------------------------------------------
0xa0000001  0028.b122.0001    1  Run                     3272  Done


----------------- show platform hardware chassis active qfp feature wireless wlclient
cpp-client statistics ------------------


Wlclient cpp-client plumbing statistics
Number Msg in = ack + nak + ack fail + nak fail + errors

Counter                                 Value
-----------------------------------------------------------------
Create from fp                          56
Modify from fp                          56
Delete from fp                          55
Create ack to fp                        56
Create ack fail to fp                   0
Create nack to fp                       0
Create nack fail to fp                  0
Modify ack to fp                        56
Modify ack fail to fp                   0
Modify nack to fp                       0
Modify nack fail to fp                  0
Delete ack to fp                        55
Delete ack fail to fp                   0
Delete nack to fp                       0
Delete nak fail to fp                   0


----------------- show platform hardware chassis active qfp feature wireless wlclient
cpp-client summary ------------------

Auth State Abbreviations:
  UK - UNKNOWN  IP - LEARN IP
  L3 - L3 AUTH  RN - RUN
```

```
   IV - INVALID
Mobility State Abbreviations:
  UK - UNKNOWN IN - INIT
  LC - LOCAL   AN - ANCHOR
  FR - FOREIGN MT - MTE
  IV - INVALID
 CPP IF_H    DPIDX      MAC Address    VLAN  AS  MS              WLAN
   POA
-------------------------------------------------------------------------------------------

  0X102    0XA0000001  0028.b122.0001  177   RN  LC              att
0x90000042


----------------- show platform hardware chassis active qfp feature wireless wlclient
datapath summary ------------------


Vlan   pal_if_hdl   mac            Input Uidb Output Uidb
------ ------------ -------------- ---------- -----------
177    0xa0000001   0028.b122.0001 95744      95742


----------------- show platform hardware chassis active qfp feature wireless wlclient
datapath statistic drop ------------------


Drop Cause                                                          Packets
      Octets
================================================================ ====================
====================
Wls Client V6 Max Address Error                                          0
           0
Wls Client IPGlean Counter Index Error                                   0
           0
Wls Client IPGlean Counter Unchanged Error                               0
           0
Wls Client IPGlean alloc no memory Error                                 0
           0
Wls Client invalid punt packet error                                     0
           0
Wls Client input subblock missing error                                  0
           0
Wls Client input config missing                                          0
           0
Wls Client global mac address fetch error                                0
           0
Wls Client header add error                                              0
           0
Wls Client IP entry theft error                                          0
           0
Wls Client IPSG input subblock missing error                             0
           0
Wls Client DOT1Q Hdr add anchor error                                    0
           0
Wls Client DOT1Q Hdr add anchor avc error                                0
           0
Wls Client Guest Foreign Multicast error                                 0
           0


----------------- show platform hardware chassis active qfp feature wireless wlclient
datapath table dataglean all ------------------
```

```
CPP Wireless IPv6 Data Gleaning Table:

IP Address                              VLAN    uIDB   Interface
-------------------------------------   ----   ------  -------------


----------------- show platform hardware chassis active qfp feature wireless ipsg cpp-client
 statistics -----------------

CPP Wireless IPSG CPP-client Statistics
Counter                      Value
---------------------------------------------------
Total IPv4 Address Count     1
Total IPv6 Address Count     0
IPv4 Entry Add Success       56
IPv4 Entry Add Fail          0
IPv4 Entry Delete Success    55
IPv4 Entry Delete Fail       0
IPv6 Entry Add Success       0
IPv6 Entry Add Fail          0
IPv6 Entry Delete Success    0
IPv6 Entry Delete Fail       0
IP Entry Override            0
IP Entry Add Req Skip        0
Data Glean Memory Req Recv   0
Data Glean Memory Req Fail   0
Data Glean Memory Reg Send   0
Data Glean Memory Ret Recv   0
Data Glean Memory Ret Send   0
Data Glean Entry Send        0
IPSG Subblock Allocate       0
IPSG Subblock Allocate Fail  0
IPSG Subblock Free           0
IPSG Subblock Free Fail      0
IPSG FIA Enable              0
IPSG FIA Enable Fail         0
IPSG FIA Disable             0
IPSG FIA Disable Fail        0
IPSG Feature Enable          0
IPSG Feature Enable Fail     0
IPSG Feature Disable         0
IPSG Feature Disable Fail    0


----------------- show platform hardware chassis active qfp feature wireless ipsg cpp-client
 table ipv4 all -----------------

CPP Wireless IPSG Table Summary
Total number of address entries: 1
IP Address                              VLAN  uIDB
---------------------------------------------------
177.1.0.7                               177   95744


----------------- show platform hardware chassis active qfp feature wireless ipsg cpp-client
 table ipv6 all -----------------

CPP Wireless IPSG Table Summary
Total number of address entries: 0


----------------- show platform hardware chassis active qfp feature wireless ipsg datapath
```

```
           statistics global ------------------


      Wireless IPSG Global Statistics
      -------------------------------
        IPv6 Dataglean entry add         :  0
        IPv6 Dataglean entry remove      :  0
        IPv6 Dataglean allocation fail   :  0
        IPv6 Dataglean pool req send     :  0
        IPv6 Dataglean pool req send fail :  0
        IPv6 Dataglean pool req resp     :  0
        IPv6 Dataglean pool ret send     :  0
        IPv6 Dataglean pool ret send fail :  0
        IPv6 Dataglean punt packet       :  0
        IPv6 Dataglean drop packet       :  0


----------------- show platform hardware chassis active qfp feature wireless ipsg datapath
 table ipv4 all ------------------


CPP Wireless IPSG IPv4 Table:

IP Address                               VLAN    uIDB    Interface
--------------------------------------   ----   ------   -------------
177.1.0.7                                 177   95744    WLCLIENT-IF-0x00a0000001


----------------- show platform hardware chassis active qfp feature wireless ipsg datapath
 table ipv6 all ------------------


CPP Wireless IPSG IPv6 Table:

IP Address                               VLAN    uIDB    Interface
--------------------------------------   ----   ------   -------------


----------------- show platform hardware chassis active qfp feature wireless halo statistics
 ------------------


Wireless HALO Statistics
                        Rx Packet Count              0
                        Rx Packet Bytes              0


----------------- show platform hardware chassis active qfp feature wireless fqdn-filter
summary ------------------


CPP Wireless FQDN Filter Info:
ID   Type     DSA_hdl    Redirect_IPv4   Virtual_IPv4
---- -------- ---------- --------------- ----------------


----------------- show platform hardware chassis active qfp feature wireless et-analytics
 statistics ------------------


Wireless ETA cpp-client plumbing statistics
Number of ETA pending clients : 0

Counter                                       Value
```

```
      -----------------------------------------------------------------
      Enable ETA on wireless client called         0
      Delete ETA on wireless client called         0
      ETA global cfg init cb TVI FIA enable error   0
      ETA global cfg init cb output SB read error   0
      ETA global cfg init cb output SB write error  0
      ETA global cfg init cb input SB read error    0
      ETA global cfg init cb input SB write error   0
      ETA global cfg init cb TVI FIA enable success 0
      ETA global cfg uninit cb ingress feat disable 0
      ETA global cfg uninit cb ingress cfg delete e 0
      ETA global cfg uninit cb egress feat disable  0
      ETA global cfg uninit cb egress cfg delete er 0
      ETA pending list insert entry called          0
      ETA pending list insert invalid arg error     0
      ETA pending list insert entry exists error    0
      ETA pending list insert no memory error       0
      ETA pending list insert entry failed          0
      ETA pending list insert entry success         0
      ETA pending list delete entry called          0
      ETA pending list delete invalid arg error     0
      ETA pending list delete entry missing         0
      ETA pending list delete entry remove error    0
      ETA pending list delete entry success         0


      ----------------- show platform hardware chassis active qfp feature wireless et-analytics
       eta-pending-client-tree -----------------
```

show tech-support wireless fabric

To display global fabric parameters, use the **show tech-support wireless fabric** command in privileged EXEC mode.

show tech-support wireless fabric

Syntax Description	This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The output of the following commands are displayed as part of **show tech-support wireless fabric** command:

- show wireless fabric summary
- show wireless profile fabric summary
- show fabric wlan summary
- show fabric ap summary
- show wireless fabric client summary
- show wireless fabric media-stream client summary
- show wireless stats fabric memory
- show wireless stats fabric control-plane all

Example

The following is sample output from the **show tech-support wireless fabric** command

show tech-support wireless mobility

To print the data related to mobility, use the **show tech-support wireless mobility** command in privileged EXEC mode.

show tech-support wireless mobility

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The output of the following commands are displayed as part of **show tech-support wireless mobility** command:

- show platform hardware chassis active qfp feature wireless capwap cpp-client summary

- show platform hardware chassis active qfp feature wireless capwap datapath summary

- show platform hardware chassis active qfp feature wireless dtls cpp-client summary

- show platform hardware chassis active qfp feature wireless dtls datapath statistics

- show platform hardware chassis active qfp feature wireless dtls datapath summary

- show platform software capwap chassis active f0

- show platform software capwap chassis active r0

- show platform software dtls chassis active f0

- show platform software dtls chassis active r0

- show platform software ipc queue-based mobilityd chassis active R0 connection

- show platform software memory messaging mobilityd chassis active R0

- show platform software memory mobilityd chassis active R0 brief

- show wireless mobility ap-list

- show wireless mobility summary

- show wireless stats mobility

- show wireless stats mobility messages

In the presence of standby node, the output of the following mobility commands are also be displayed:

- show platform hardware chassis standby qfp feature wireless capwap cpp-client summary

- show platform hardware chassis standby qfp feature wireless capwap datapath summary

- show platform hardware chassis standby qfp feature wireless dtls cpp-client summary

- show platform hardware chassis standby qfp feature wireless dtls datapath statistics

- show platform hardware chassis standby qfp feature wireless dtls datapath summary

- show platform software capwap chassis standby f0

- show platform software capwap chassis standby r0

- show platform software dtls chassis standby f0

- show platform software dtls chassis standby r0

- show platform software ipc queue-based mobilityd chassis standby R0 connection

- show platform software memory messaging mobilityd chassis standby R0

- show platform software memory mobilityd chassis standby R0 brief

- show wireless stats mobility messages chassis standby r0

Example

The following is sample output from the **show tech-support wireless mobility** command

```
Device# show tech-support wireless mobility

------------------ show wireless stats mobility ------------------


Mobility event statistics:
    Joined as
        Local                       : 0
        Foreign                     : 0
        Export foreign              : 0
        Export anchor               : 0
    Delete
        Local                       : 0
        Remote                      : 0
    Role changes
        Local to anchor             : 0
        Anchor to local             : 0
    Roam stats
        L2 roam count               : 0
        L3 roam count               : 0
        Flex client roam count      : 0
        Inter-WNCd roam count       : 0
        Intra-WNCd roam count       : 0
    Anchor Request
        Sent                        : 0
          Grant received            : 0
          Deny received             : 0
        Received                    : 0
          Grant sent                : 0
          Deny  sent                : 0
    Handoff Status Received
        Success                     : 0
        Group mismatch              : 0
```

```
                     Client unknown              : 0
                     Client blacklisted          : 0
                     SSID mismatch               : 0
                     Denied                      : 0
                 Handoff Status Sent
                     Success                     : 0
                     Group mismatch              : 0
                     Client unknown              : 0
                     Client blacklisted          : 0
                     SSID mismatch               : 0
                     Denied                      : 0
                 Export Anchor
                     Request Sent                : 0
                     Response Received           :
                         Ok                      : 0
                         Deny - generic          : 0
                         Client blacklisted      : 0
                         Client limit reached    : 0
                         Profile mismatch        : 0
                         Deny - unknown reason   : 0
                     Request Received            : 0
                     Response Sent               :
                         Ok                      : 0
                         Deny - generic          : 0
                         Client blacklisted      : 0
                         Client limit reached    : 0
                         Profile mismatch        : 0
        MM mobility event statistics:
                 Event data allocs               : 0
                 Event data frees                : 0
                 FSM set allocs                  : 0
                 FSM set frees                   : 0
                 Timer allocs                    : 0
                 Timer frees                     : 0
                 Timer starts                    : 0
                 Timer stops                     : 0
                 Invalid events                  : 0
                 Internal errors                 : 0


        MMIF mobility event statistics:
                 Event data allocs               : 0
                 Event data frees                : 0
                 Invalid events                  : 0
                 Unkown events                   : 0
                 Event schedule errors           : 0
                 Internal errors                 : 0



        ------------------ show wireless stats mobility messages ------------------



        MM datagram message statistics:
          Message Type              Built  Tx    Rx    Processed  Tx Error  Rx Error  Forwarded
        Retry  Drops  Allocs  Frees


        -----------------------------------------------------------------------------------------------

          Mobile Announce           0      0     0     0          0         0         0
        0      0      0       0
          Mobile Announce Nak       0      0     0     0          0         0         0
        0      0      0       0
```

Static IP Mobile Annc	0	0	0	0	0	0	0
0 0 0 0							
Static IP Mobile Annc Rsp	0	0	0	0	0	0	0
0 0 0 0							
Handoff	0	0	0	0	0	0	0
0 0 0 0							
Handoff End	0	0	0	0	0	0	0
0 0 0 0							
Handoff End Ack	0	0	0	0	0	0	0
0 0 0 0							
Anchor Req	0	0	0	0	0	0	0
0 0 0 0							
Anchor Grant	0	0	0	0	0	0	0
0 0 0 0							
Anchor Xfer	0	0	0	0	0	0	0
0 0 0 0							
Anchor Xfer Ack	0	0	0	0	0	0	0
0 0 0 0							
Export Anchor Req	0	0	0	0	0	0	0
0 0 0 0							
Export Anchor Rsp	0	0	0	0	0	0	0
0 0 0 0							
AAA Handoff	0	0	0	0	0	0	0
0 0 0 0							
AAA Handoff Ack	0	0	0	0	0	0	0
0 0 0 0							
IPv4 Addr Update	0	0	0	0	0	0	0
0 0 0 0							
IPv4 Addr Update Ack	0	0	0	0	0	0	0
0 0 0 0							
IPv6 ND Packet	0	0	0	0	0	0	0
0 0 0 0							
IPv6 Addr Update	0	0	0	0	0	0	0
0 0 0 0							
IPv6 Addr Update Ack	0	0	0	0	0	0	0
0 0 0 0							
Client Add	0	0	0	0	0	0	0
0 0 0 0							
Client Delete	0	0	0	0	0	0	0
0 0 0 0							
Keepalive Ctrl Req	0	0	0	0	0	0	0
0 0 0 0							
Keepalive Ctrl Resp	0	0	0	0	0	0	0
0 0 0 0							
AP List Update	0	0	0	0	0	0	0
0 0 0 0							
Client Device Profile Info	0	0	0	0	0	0	0
0 0 0 0							
PMK Update	0	0	0	0	0	0	0
0 0 0 0							
PMK Delete	0	0	0	0	0	0	0
0 0 0 0							
PMK 11r Nonce Update	0	0	0	0	0	0	0
0 0 0 0							
Device cache Update	0	0	0	0	0	0	0
0 0 0 0							
HA SSO Announce	0	0	0	0	0	0	0
0 0 0 0							
HA SSO Announce Resp	0	0	0	0	0	0	0
0 0 0 0							

```
MM IPC message statistics:
 Message Type           Built  Tx   Rx    Processed  Tx Error  Rx Error  Forwarded
Drops  Allocs  Frees
```

```
--------------------------------------------------------------------------------------------------------

    Mobile Announce          0       0       0       0        0        0        0
0       0        0
    Mobile Announce Nak      0       0       0       0        0        0        0
0       0        0
    Static IP Mobile Annc    0       0       0       0        0        0        0
0       0        0
    Static IP Mobile Annc Rsp 0      0       0       0        0        0        0
0       0        0
    Handoff                  0       0       0       0        0        0        0
0       0        0
    Handoff End              0       0       0       0        0        0        0
0       0        0
    Handoff End Ack          0       0       0       0        0        0        0
0       0        0
    Anchor Req               0       0       0       0        0        0        0
0       0        0
    Anchor Grant             0       0       0       0        0        0        0
0       0        0
    Anchor Xfer              0       0       0       0        0        0        0
0       0        0
    Anchor Xfer Ack          0       0       0       0        0        0        0
0       0        0
    Export Anchor Req        0       0       0       0        0        0        0
0       0        0
    Export Anchor Rsp        0       0       0       0        0        0        0
0       0        0
    AAA Handoff              0       0       0       0        0        0        0
0       0        0
    AAA Handoff Ack          0       0       0       0        0        0        0
0       0        0
    IPv4 Addr Update         0       0       0       0        0        0        0
0       0        0
    IPv4 Addr Update Ack     0       0       0       0        0        0        0
0       0        0
    IPv6 ND Packet           0       0       0       0        0        0        0
0       0        0
    IPv6 Addr Update         0       0       0       0        0        0        0
0       0        0
    IPv6 Addr Update Ack     0       0       0       0        0        0        0
0       0        0
    Client Add               0       0       0       0        0        0        0
0       0        0
    Client Delete            0       0       0       0        0        0        0
0       0        0
    Keepalive Ctrl Req       0       0       0       0        0        0        0
0       0        0
    Keepalive Ctrl Resp      0       0       0       0        0        0        0
0       0        0
    AP List Update           0       0       0       0        0        0        0
0       0        0
    Client Device Profile Info 0     0       0       0        0        0        0
0       0        0
    PMK Update               0       0       0       0        0        0        0
0       0        0
    PMK Delete               0       0       0       0        0        0        0
0       0        0
    PMK 11r Nonce Update     0       0       0       0        0        0        0
0       0        0
    Device cache Update      0       0       0       0        0        0        0
0       0        0
    HA SSO Announce          0       0       0       0        0        0        0
```

```
 0       0        0
   HA SSO Announce Resp       0        0     0     0          0         0         0
 0       0        0
```

MMIF IPC message statistics:

Message Type	Built	Tx	Rx	Processed	Tx Error	Rx Error	Drops	Allocs Frees
Mobile Announce	0	0	0	0	0	0	0	0 0
Mobile Announce Nak	0	0	0	0	0	0	0	0 0
Static IP Mobile Annc	0	0	0	0	0	0	0	0 0
Static IP Mobile Annc Rsp	0	0	0	0	0	0	0	0 0
Handoff	0	0	0	0	0	0	0	0 0
Handoff End	0	0	0	0	0	0	0	0 0
Handoff End Ack	0	0	0	0	0	0	0	0 0
Anchor Req	0	0	0	0	0	0	0	0 0
Anchor Grant	0	0	0	0	0	0	0	0 0
Anchor Xfer	0	0	0	0	0	0	0	0 0
Anchor Xfer Ack	0	0	0	0	0	0	0	0 0
Export Anchor Req	0	0	0	0	0	0	0	0 0
Export Anchor Rsp	0	0	0	0	0	0	0	0 0
AAA Handoff	0	0	0	0	0	0	0	0 0
AAA Handoff Ack	0	0	0	0	0	0	0	0 0
IPv4 Addr Update	0	0	0	0	0	0	0	0 0
IPv4 Addr Update Ack	0	0	0	0	0	0	0	0 0
IPv6 ND Packet	0	0	0	0	0	0	0	0 0
IPv6 Addr Update	0	0	0	0	0	0	0	0 0
IPv6 Addr Update Ack	0	0	0	0	0	0	0	0 0
Client Add	0	0	0	0	0	0	0	0 0
Client Delete	0	0	0	0	0	0	0	0 0
Keepalive Ctrl Req	0	0	0	0	0	0	0	0 0
Keepalive Ctrl Resp	0	0	0	0	0	0	0	0 0
AP List Update	0	0	0	0	0	0	0	0 0
Client Device Profile Info	0	0	0	0	0	0	0	0 0
PMK Update	0	0	0	0	0	0	0	0 0

```
    PMK Delete               0      0      0      0         0         0         0         0
      0
    PMK 11r Nonce Update     0      0      0      0         0         0         0         0
      0
    Device cache Update      0      0      0      0         0         0         0         0
      0
    HA SSO Announce          0      0      0      0         0         0         0         0
      0
    HA SSO Announce Resp     0      0      0      0         0         0         0         0
      0


----------------- show wireless mobility summary ------------------


Mobility Summary

Wireless Management VLAN: 32
Wireless Management IP Address: 9.12.32.10
Mobility Control Message DSCP Value: 48
Mobility Keepalive Interval/Count: 10/3
Mobility Group Name: default
Mobility Multicast Ipv4 address: 0.0.0.0
Mobility Multicast Ipv6 address: ::
Mobility MAC Address: 001e.f6c1.f6ff

Controllers configured in the Mobility Domain:

 IP             Public Ip        Group Name                  Multicast IPv4
Multicast IPv6                             Status              PMTU
-----------------------------------------------------------------------------------------------
9.12.32.10      N/A              default                     0.0.0.0            ::
                                              N/A                N/A


----------------- show wireless mobility ap-list ------------------



----------------- show platform software capwap chassis active r0 ------------------



----------------- show platform software capwap chassis active f0 ------------------



----------------- show platform software dtls chassis active r0 ------------------



----------------- show platform software dtls chassis active f0 ------------------



----------------- show platform hardware chassis active qfp feature wireless capwap
cpp-client summary ------------------



----------------- show platform hardware chassis active qfp feature wireless dtls cpp-client
 summary ------------------
```

```
----------------- show platform hardware chassis active qfp feature wireless capwap datapath
 summary -----------------


Vrf Src Port Dst IP        Dsp Port Input Uidb Output Uidb Instance Id
--- -------- ------        -------- ---------- ----------- -----------


----------------- show platform hardware chassis active qfp feature wireless dtls datapath
 statistics -----------------


CPP Wireless DTLS Feature Stats

                                Description   Packet Count    Octet Count
                                -----------   ------------    -----------
    DTLS Packets To Encrypt                             0              0
    DTLS Packets Encrypted                              0              0
    DTLS Packets To Decrypt                             0              0
    DTLS Packets Decrypted                              0              0
    Skip Encryption - Handshake                         0              0
    Skip Encryption - Not AppData                       0              0
    Skip Encryption - No Hash Entry                     0              0
    Skip Encryption - No Crypto Handle                  0              0
    Skip Encryption - No DTLS header                    0              0
    Skip Encryption - Requested by RP                   0              0
    Skip Decryption - Handshake                         0              0
    Skip Decryption - Not AppData                       0              0
    Skip Decryption - No Hash Entry                     0              0
    Skip Decryption - No Crypto Handle                  0              0
    Skip Decryption - No DTLS header                    0              0
    Skip Decryption - Multiple Records                  0              0
    Error - Encrypt Invalid Length                      0              0
    Error - Encrypt Header Restore                      0              0
    Error - DataEncrypt No Crypto Handle                0              0
    Error - DataEncrypt Header Restore                  0              0
    Error - Decrypt Invalid Length                      0              0
    Error - Decrypt Header Restore                      0              0
    Error - DataDecrypt Zero Epoch                      0              0
    Error - DataDecrypt No Hash Entry                   0              0
    Error - DataDecrypt No Crypto Handle                0              0
    Error - DataDecrypt Header Restore                  0              0


----------------- show platform hardware chassis active qfp feature wireless dtls datapath
 summary -----------------


Src IP          Dst IP          Src Port Dst Port  Crypto HDL       Instance Id
------          ------          -------- -------   -----------      ----------

----------------- show platform software ipc queue-based mobilityd chassis active R0
connection -----------------

Name: -mobilityd_to_wncd-b0
  Number     : 0
  Mode       : writer
  Created on : 03/22/18 05:35:06
  Queue Size : 524288 bytes, 0 bytes currently used
  Enqueued   : 12 msgs, 432 bytes, 0 err, 0 back-pressures,
               360 bytes max queue utilization,
               0 times reached above 90%, 0 times reached above 75%
```

```
            Name: -mobilityd_to_wncd-b1
              Number    : 1
              Mode      : writer
              Created on : 03/22/18 05:35:06
              Queue Size : 524288 bytes, 0 bytes currently used
              Enqueued  : 12 msgs, 432 bytes, 0 err, 0 back-pressures,
                          360 bytes max queue utilization,
                          0 times reached above 90%, 0 times reached above 75%

            Name: -mobilityd_to_wncd-b2
              Number    : 2
              Mode      : writer
              Created on : 03/22/18 05:35:06
              Queue Size : 524288 bytes, 0 bytes currently used
              Enqueued  : 12 msgs, 432 bytes, 0 err, 0 back-pressures,
                          360 bytes max queue utilization,
                          0 times reached above 90%, 0 times reached above 75%

            Name: -mobilityd_to_fman_rp-b0
              Number    : 3
              Mode      : writer
              Created on : 03/22/18 05:35:06
              Queue Size : 524288 bytes, 0 bytes currently used
              Enqueued  : 0 msgs, 0 bytes, 0 err, 0 back-pressures,
                          0 bytes max queue utilization,
                          0 times reached above 90%, 0 times reached above 75%

            Name: -mobilityd_to_iosd_rp-b0
              Number    : 4
              Mode      : writer
              Created on : 03/22/18 05:35:06
              Queue Size : 524288 bytes, 0 bytes currently used
              Enqueued  : 204647 msgs, 15757819 bytes, 0 err, 0 back-pressures,
                          81 bytes max queue utilization,
                          0 times reached above 90%, 0 times reached above 75%

            Name: -mobilityd_to_wncmgrd-b0
              Number    : 5
              Mode      : writer
              Created on : 03/22/18 05:35:06
              Queue Size : 524288 bytes, 0 bytes currently used
              Enqueued  : 12 msgs, 432 bytes, 0 err, 0 back-pressures,
                          360 bytes max queue utilization,
                          0 times reached above 90%, 0 times reached above 75%

            Name: -odm_clnt2svr_data-mobilityd-000-1
              Number    : 6
              Mode      : writer
              Created on : 03/22/18 05:35:06
              Queue Size : 2097152 bytes, 0 bytes currently used
              Enqueued  : 33 msgs, 12535 bytes, 0 err, 0 back-pressures,
                          3769 bytes max queue utilization,
                          0 times reached above 90%, 0 times reached above 75%

            Name: -odm_svr2clnt_data-mobilityd-000-1
              Number    : 7
              Mode      : reader
              Created on : 03/22/18 05:35:06
              Queue Size : 2097152 bytes, 0 bytes currently used
              Dequeued  : 0 msgs, 0 bytes, 0 err

            Name: -fman_rp_to_mobilityd-b0
              Number    : 8
              Mode      : reader
```

```
              Created on : 03/22/18 05:35:08
              Queue Size : 524288 bytes, 0 bytes currently used
              Dequeued   : 0 msgs, 0 bytes, 0 err

       Name: -wncd_to_mobilityd-b0
         Number     : 9
         Mode       : reader
         Created on : 03/22/18 05:35:13
         Queue Size : 524288 bytes, 0 bytes currently used
         Dequeued   : 39 msgs, 1404 bytes, 0 err

       Name: -wncd_to_mobilityd-b1
         Number     : 10
         Mode       : reader
         Created on : 03/22/18 05:35:13
         Queue Size : 524288 bytes, 0 bytes currently used
         Dequeued   : 39 msgs, 1404 bytes, 0 err

       Name: -wncd_to_mobilityd-b2
         Number     : 11
         Mode       : reader
         Created on : 03/22/18 05:35:14
         Queue Size : 524288 bytes, 0 bytes currently used
         Dequeued   : 39 msgs, 1404 bytes, 0 err

       Name: -wncmgrd_to_mobilityd-b0
         Number     : 12
         Mode       : reader
         Created on : 03/22/18 05:35:14
         Queue Size : 524288 bytes, 0 bytes currently used
         Dequeued   : 18 msgs, 648 bytes, 0 err

       Name: -iosd_rp_to_mobilityd-b0
         Number     : 13
         Mode       : reader
         Created on : 03/22/18 05:35:30
         Queue Size : 1048576 bytes, 0 bytes currently used
         Dequeued   : 204647 msgs, 18827524 bytes, 0 err

       Name: -odm_clnt2svr_data-ifid-005-1
         Number     : 14
         Mode       : writer
         Created on : 03/22/18 05:35:37
         Queue Size : 2097152 bytes, 0 bytes currently used
         Enqueued   : 0 msgs, 0 bytes, 0 err, 0 back-pressures,
                      0 bytes max queue utilization,
                      0 times reached above 90%, 0 times reached above 75%

       Name: -odm_svr2clnt_data-ifid-005-1
         Number     : 15
         Mode       : reader
         Created on : 03/22/18 05:35:37
         Queue Size : 2097152 bytes, 0 bytes currently used
         Dequeued   : 0 msgs, 0 bytes, 0 err


    ------------------ show platform software memory messaging mobilityd chassis active R0
    ------------------

    [tdl_toc] type toc_table_info/47da701cd9c36de7e888ca6d8dd80390/0 created:3 destroyed:3
    diff:0
    [tdl_sr] type repl_table_name/29184a6d15c1ba11acb2d0bd22eb6e36/0 created:33 destroyed:33
    diff:0
```

```
[tdl_sr] type repl_database_name/e9118a691a20b4b8f1118bc37a894603/0 created:33 destroyed:33
 diff:0
[tdl_sr] type repl_pkey_tdl/83de2d20ec3ca19b8ae9a89147480a25/1 created:33 destroyed:33
diff:0
[tdl_sr] type repl_blob_tdl/016a67083ea407334130436c855ae237/0 created:33 destroyed:33
diff:0
[tdl_sr] type repl_luid/b9c9d9f4876af528cb82273df98479d6/0 created:33 destroyed:33 diff:0
[tdl_sr] type repl_objinfo/6c8800fedf8d71512f9b6c9754db3a70/0 created:33 destroyed:33 diff:0
[tdl_sr] message repl_trec_update/15fe2a39409473179c9e7111851b2196/0 created:33 destroyed:33
 diff:0
[pki_ssl] type buff/941d8a519d6f23d27067617119f1bb38/0 created:613944 destroyed:613944
diff:0
[pki_ssl] type get_certid_params/0d7bcce690f74649c2e33bbf341e2229/0 created:204648
destroyed:204648 diff:0
[pki_ssl] type get_certid_callback_params/708b7fb964ace7971d90a452c830488c/0 created:204648
 destroyed:204648 diff:0
[pki_ssl] message get_certid/ee3bfe6b93901440346417a4ad67fa63/0 created:204648
destroyed:204648 diff:0
[pki_ssl] message get_certid_callback/372218059d7a753ba73f7b06f18532e9/0 created:204648
destroyed:204648 diff:0
[svc_defs] type svc_loc/929237802cf26e862f8e8716169e31ef/0 created:40952 destroyed:40951
diff:1
[ui_shr] type ui_client/bec7457db0c33cae9eeebbf80073b771/0 created:3 destroyed:2 diff:1
[ui] type ui_info/4b8b42a883fabbb98ec8b919f60e4ad6/0 created:40949 destroyed:40949 diff:0
[ui] type ui_req/69f1e2a5943e050f0aa12df8639ba442/0 created:3 destroyed:2 diff:1
[ui] type event_statistics/7f346ee47165c035a72e139b84afb2a0/0 created:40948 destroyed:40948
 diff:0
[ui] type hostinfo_data/54d5a8b0cd4d29d575b2fc0d91695b5e/0 created:3 destroyed:3 diff:0
[ui] message ui_info_msg/bec533dd713e0222cb8fe5df868031f0/0 created:1 destroyed:1 diff:0
[ui] message ui_req_msg/ac9905cc4488c976847affab56d8b50c/0 created:3 destroyed:2 diff:1
[ui] message process_event_statistics/65d07aa3a04ad950cddd46444df6bc02/0 created:40948
destroyed:40948 diff:0
[ui] message hostinfo_notify/2e9d975712b85b41bc489a6adbc4a46c/0 created:3 destroyed:3 diff:0
[uipeer_comm_ui] type mqipc_enqueue_stats/8f41e408c97a799a5e431d2279acd8de/0 created:8
destroyed:8 diff:0
[uipeer_comm_ui] type mqipc_dequeue_stats/aafe5d0a37ba9652d68550efa26eb0b6/0 created:8
destroyed:8 diff:0
[uipeer_comm_ui] type mqipc_connection_properties/35bd274fd85f7359066f898f25c853ee/0
created:16 destroyed:16 diff:0
[uipeer_comm_ui] message mqipc_connection/a1b22c74b279335b895531ce708c804b/0 created:16
destroyed:16 diff:0
[mem_stats_ui] type tdl_variant_stat/bd85e4b89fb10501e68c1a3cedb9f321/0 created:1 destroyed:0
 diff:1
[mem_stats_ui] message tdl_mem_stats/60ffd9d51213767d041b543869df15d2/0 created:1 destroyed:0
 diff:1
[cdlcore] type cdl_params/a3e74327d37abf27f799f2b5155f4923/0 created:2 destroyed:1 diff:1
[cdlcore] message cdl_message/35205e535c7ab2cdcb3c265ac788f973/0 created:2 destroyed:1
diff:1
[odm_defs] type odm_context/73aeecb77a1ccb6e44f690745cdafe0d/1 created:23 destroyed:23
diff:0
[odm_defs] type odm_register_info/48a7d590e9df0cc9d150801315c50307/1 created:4 destroyed:4
 diff:0
[odm_defs] type odm_table_register_info/4f355a34615affd49af9f90b679d8ce5/1 created:17
destroyed:17 diff:0
[odm_defs] type odm_register_result/53ba304bc0a71a7d2a044518c21f662a/0 created:2 destroyed:2
 diff:0
[odm_defs] message odm_register/2c98272b43d973fa08bbf5acdf3106b0/0 created:2 destroyed:2
diff:0
[odm_defs] message odm_table_register/46694ec1005c3b084337748eeb3768cd/0 created:17
destroyed:17 diff:0
[odm_defs] message odm_register_done/1f6c8f81fcbb8a3052428bab7588e8b5/0 created:2 destroyed:2
 diff:0
[odm_defs] message odm_register_ack/03b8040ed4f7b03517b410c32568ecaa/0 created:2 destroyed:2
 diff:0
```

```
------------------ show platform software memory mobilityd chassis active R0 brief
------------------

 module              allocated     requested     allocs        frees
 --------------------------------------------------------------------------
 Summary             620441        617113        233           25
 unknown             198515        198435        5             0
 chunk               139689        139209        30            0
 eventutil           118939        118299        48            8
 process             67642         67594         3             0
 odm-db-ctx          29950         28430         100           5
 uipeer              22672         22592         11            6
 odm-ipc-ctx         20272         19984         18            0
 unknown             18024         18008         1             0
 odm-client-ctx      1872          1824          3             0
 cdllib              1688          1672          3             2
 trccfg              512           496           5             4
 bidb                472           456           1             0
 unknown             96            48            3             0
 bcrdu_avl           72            56            1             0
 orchestrator_main   26            10            1             0
```

show tech-support wireless radio

To print the data related to the radio, use the **show tech-support wireless radio** command in privileged EXEC mode.

show tech-support wireless radio

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

The output of the following commands are displayed as part of **show tech-support wireless radio** command:

- show ap auto-rf dot11 24ghz

- show ap auto-rf dot11 5ghz

- show ap config dot11 dual-band summary

- show ap config general

- show ap dot11 24ghz channel

- show ap dot11 24ghz coverage

- show ap dot11 24ghz group

- show ap dot11 24ghz high-density

- show ap dot11 24ghz load-info

- show ap dot11 24ghz monitor

- show ap dot11 24ghz network

- show ap dot11 24ghz summary

- show ap dot11 24ghz txpower

- show ap dot11 5ghz channel

- show ap dot11 5ghz coverage

- show ap dot11 5ghz group

- show ap dot11 5ghz high-density

- show ap dot11 5ghz load-info

- show ap dot11 5ghz monitor

- show ap dot11 5ghz network

- show ap dot11 5ghz summary

- show ap dot11 5ghz txpower

- show ap fra

- show ap rf-profile name Rf1 detail

- show ap rf-profile summary

- show ap summary

- show wireless band-select

Example

The following is sample output from the **show tech-support wireless radio** command

```
Device# show tech-support wireless radio

----------------- show ap summary -----------------


Number of APs: 0



----------------- show ap dot11 24ghz summary -----------------



----------------- show ap dot11 5ghz summary -----------------



----------------- show ap config dot11 dual-band summary -----------------



----------------- show ap dot11 24ghz channel -----------------


Leader Automatic Channel Assignment
  Channel Assignment Mode                   : AUTO
  Channel Update Interval                   : 600 seconds
  Anchor time (Hour of the day)             : 0
  Channel Update Contribution
    Noise                                   : Enable
    Interference                            : Enable
    Load                                    : Disable
    Device Aware                            : Disable
  CleanAir Event-driven RRM option          : Disabled
  Channel Assignment Leader                 : ewlc-doc (9.12.32.10)
  Last Run                                  : 550 seconds ago

  DCA Sensitivity Level                     : MEDIUM : 10 dB
  DCA Minimum Energy Limit                  : -95 dBm
  Channel Energy Levels
```

```
      Minimum                                : unknown
      Average                                : unknown
      Maximum                                : -128 dBm
    Channel Dwell Times
      Minimum                                : unknown
      Average                                : unknown
      Maximum                                : unknown
    802.11b 2.4 GHz Auto-RF Channel List
      Allowed Channel List                   : 1,6,11
      Unused Channel List                    : 2,3,4,5,7,8,9,10


----------------- show ap dot11 5ghz channel -----------------


Leader Automatic Channel Assignment
  Channel Assignment Mode                  : AUTO
  Channel Update Interval                  : 600 seconds
  Anchor time (Hour of the day)            : 0
  Channel Update Contribution
    Noise                                  : Enable
    Interference                           : Enable
    Load                                   : Disable
    Device Aware                           : Disable
  CleanAir Event-driven RRM option         : Disabled
  Channel Assignment Leader                : ewlc-doc (9.12.32.10)
  Last Run                                 : 552 seconds ago

  DCA Sensitivity Level                    : MEDIUM : 15 dB
  DCA 802.11n/ac Channel Width             : 20 MHz
  DCA Minimum Energy Limit                 : -95 dBm
  Channel Energy Levels
    Minimum                                : unknown
    Average                                : unknown
    Maximum                                : -128 dBm
  Channel Dwell Times
    Minimum                                : unknown
    Average                                : unknown
    Maximum                                : unknown
  802.11a 5 GHz Auto-RF Channel List
    Allowed Channel List                   :
36,40,44,48,52,56,60,64,100,104,108,112,116,120,124,128,132,136,140,144,149,153,157,161
    Unused Channel List                    : 165


----------------- show ap dot11 24ghz coverage -----------------


Coverage Hole Detection
  802.11b Coverage Hole Detection Mode        : Enabled
  802.11b Coverage Voice Packet Count         : 100 packet(s)
  802.11b Coverage Voice Packet Percentage    : 50%
  802.11b Coverage Voice RSSI Threshold       : -80 dBm
  802.11b Coverage Data Packet Count          : 50 packet(s)
  802.11b Coverage Data Packet Percentage     : 50%
  802.11b Coverage Data RSSI Threshold        : -80 dBm
  802.11b Global coverage exception level     : 25 %
  802.11b Global client minimum exception level    : 3 clients


----------------- show ap dot11 5ghz coverage -----------------


Coverage Hole Detection
```

```
    802.11a Coverage Hole Detection Mode      : Enabled
    802.11a Coverage Voice Packet Count       : 100 packet(s)
    802.11a Coverage Voice Packet Percentage  : 50 %
    802.11a Coverage Voice RSSI Threshold     : -80dBm
    802.11a Coverage Data Packet Count        : 50 packet(s)
    802.11a Coverage Data Packet Percentage   : 50 %
    802.11a Coverage Data RSSI Threshold      : -80dBm
    802.11a Global coverage exception level   : 25 %
    802.11a Global client minimum exception level : 3 clients


----------------- show ap dot11 24ghz group -----------------


Radio RF Grouping

  802.11b Group Mode            : AUTO
  802.11b Group Update Interval : 600 seconds
  802.11b Group Leader          : ewlc-doc (9.12.32.10)
  802.11b Last Run              : 553 seconds ago


RF Group Members

Controller name                 Controller IP
-----------------------------------------------
ewlc-doc                        9.12.32.10




----------------- show ap dot11 5ghz group -----------------


Radio RF Grouping

  802.11a Group Mode            : AUTO
  802.11a Group Update Interval : 600 seconds
  802.11a Group Leader          : ewlc-doc (9.12.32.10)
  802.11a Last Run              : 553 seconds ago


RF Group Members

Controller name                 Controller IP
-----------------------------------------------
ewlc-doc                        9.12.32.10




----------------- show ap dot11 24ghz high-density -----------------


----------------- show ap dot11 5ghz high-density -----------------


----------------- show ap dot11 5ghz load-info -----------------


----------------- show ap dot11 24ghz load-info -----------------
```

```
----------------- show ap dot11 24ghz profile -----------------


Default 802.11b AP performance profiles
  802.11b Global Interference threshold    : 10 %
  802.11b Global noise threshold           : -70 dBm
  802.11b Global RF utilization threshold  : 80 %
  802.11b Global throughput threshold      : 1000000 bps
  802.11b Global clients threshold         : 12 clients


----------------- show ap dot11 5ghz profile -----------------


Default 802.11a AP performance profiles

  802.11a Global Interference threshold       : 10 %
  802.11a Global noise threshold              : -70 dBm
  802.11a Global RF utilization threshold     : 80 %
  802.11a Global throughput threshold         : 1000000 bps
  802.11a Global clients threshold            : 12 clients


----------------- show ap dot11 24ghz monitor -----------------


Default 802.11b AP monitoring
  802.11b Monitor Mode                : Enabled
  802.11b Monitor Channels            : Country channels
  802.11b RRM Neighbor Discover Type  : Transparent
  802.11b AP Coverage Interval        : 180 seconds
  802.11b AP Load Interval            : 60 seconds
  802.11b AP Noise Interval           : 180 seconds
  802.11b AP Signal Strength Interval : 60 seconds
  802.11b NDP RSSI Normalization      : Enabled


----------------- show ap dot11 5ghz monitor -----------------


Default 802.11a AP monitoring
  802.11a Monitor Mode                : Enabled
  802.11a Monitor Channels            : Country channels
  802.11a RRM Neighbor Discover Type  : Transparent
  802.11a AP Coverage Interval        : 180 seconds
  802.11a AP Load Interval            : 60 seconds
  802.11a AP Noise Interval           : 180 seconds
  802.11a AP Signal Strength Interval : 60 seconds
  802.11a NDP RSSI Normalization      : Enabled


----------------- show ap dot11 24ghz network -----------------


802.11b Network                          : Enabled
11gSupport                               : Enabled
11nSupport                               : Enabled
802.11b/g Operational Rates
  802.11b 1M                             : Mandatory
```

```
    802.11b 2M                              : Mandatory
    802.11b 5.5M                            : Mandatory
    802.11b 11M                             : Mandatory
    802.11g 6M                              : Supported
    802.11g 9M                              : Supported
    802.11g 12M                             : Supported
    802.11g 18M                             : Supported
    802.11g 24M                             : Supported
    802.11g 36M                             : Supported
    802.11g 48M                             : Supported
    802.11g 54M                             : Supported
802.11n MCS Settings:
  MCS 0 : Supported
  MCS 1 : Supported
  MCS 2 : Supported
  MCS 3 : Supported
  MCS 4 : Supported
  MCS 5 : Supported
  MCS 6 : Supported
  MCS 7 : Supported
  MCS 8 : Supported
  MCS 9 : Supported
  MCS 10 : Supported
  MCS 11 : Supported
  MCS 12 : Supported
  MCS 13 : Supported
  MCS 14 : Supported
  MCS 15 : Supported
  MCS 16 : Supported
  MCS 17 : Supported
  MCS 18 : Supported
  MCS 19 : Supported
  MCS 20 : Supported
  MCS 21 : Supported
  MCS 22 : Supported
  MCS 23 : Supported
  MCS 24 : Supported
  MCS 25 : Supported
  MCS 26 : Supported
  MCS 27 : Supported
  MCS 28 : Supported
  MCS 29 : Supported
  MCS 30 : Supported
  MCS 31 : Supported
802.11n Status:
  A-MPDU Tx:
    Priority 0                              : Enabled
    Priority 1                              : Disabled
    Priority 2                              : Disabled
    Priority 3                              : Disabled
    Priority 4                              : Enabled
    Priority 5                              : Enabled
    Priority 6                              : Disabled
    Priority 7                              : Disabled
    Aggregation scheduler                   : Enabled
    Realtime timeout                        : 10
  A-MSDU Tx:
    Priority 0                              : Enable
    Priority 1                              : Enable
    Priority 2                              : Enable
    Priority 3                              : Enable
    Priority 4                              : Enable
    Priority 5                              : Enable
    Priority 6                              : Disable
```

```
      Priority 7                        : Disable
   Guard Interval                       : Any
   Rifs Rx                              : Enabled
Beacon Interval                         : 100
CF Pollable mandatory                   : Disabled
CF Poll Request Mandatory               : Disabled
CFP Period                              : 4
CFP Maximum Duration                    : 60
Default Channel                         : 1
Default Tx Power Level                  : 1
DTPC Status                             : Enabled
Call Admission Limit                    :
G711 CU Quantum                         :
ED Threshold                            : -50
Fragmentation Threshold                 : 2346
RSSI Low Check                          : Disabled
RSSI Threshold                          : -127 dbm
PBCC Mandatory                          : unknown
Pico-Cell-V2 Status                     : unknown
RTS Threshold                           : 2347
Short Preamble Mandatory                : Enabled
Short Retry Limit                       : 7
Legacy Tx Beamforming setting           : Disabled
Traffic Stream Metrics Status           : Disabled
Expedited BW Request Status             : Disabled
EDCA profile type check                 : default-wmm
Call Admision Control (CAC) configuration
Voice AC
   Voice AC - Admission control (ACM)   : Disabled
   Voice Stream-Size                    : 84000
   Voice Max-Streams                    : 2
   Voice Max RF Bandwidth               : 75
   Voice Reserved Roaming Bandwidth     : 6
   Voice Load-Based CAC mode            : Enabled
   Voice tspec inactivity timeout       : Enabled
CAC SIP-Voice configuration
   SIP based CAC                        : Disabled
   SIP call bandwidth                   : 64
   SIP call bandwith sample-size        : 20
Maximum Number of Clients per AP Radio  : 200


----------------- show ap dot11 5ghz network -----------------



802.11a Network                         : Enabled
11nSupport                              : Enabled
   802.11a Low Band                     : Enabled
   802.11a Mid Band                     : Enabled
   802.11a High Band                    : Enabled
802.11a Operational Rates
   802.11a 6M                           : Mandatory
   802.11a 9M                           : Supported
   802.11a 12M                          : Mandatory
   802.11a 18M                          : Supported
   802.11a 24M                          : Mandatory
   802.11a 36M                          : Supported
   802.11a 48M                          : Supported
   802.11a 54M                          : Supported
802.11n MCS Settings:
   MCS 0 : Supported
   MCS 1 : Supported
   MCS 2 : Supported
```

```
                 MCS 3 : Supported
                 MCS 4 : Supported
                 MCS 5 : Supported
                 MCS 6 : Supported
                 MCS 7 : Supported
                 MCS 8 : Supported
                 MCS 9 : Supported
                 MCS 10 : Supported
                 MCS 11 : Supported
                 MCS 12 : Supported
                 MCS 13 : Supported
                 MCS 14 : Supported
                 MCS 15 : Supported
                 MCS 16 : Supported
                 MCS 17 : Supported
                 MCS 18 : Supported
                 MCS 19 : Supported
                 MCS 20 : Supported
                 MCS 21 : Supported
                 MCS 22 : Supported
                 MCS 23 : Supported
                 MCS 24 : Supported
                 MCS 25 : Supported
                 MCS 26 : Supported
                 MCS 27 : Supported
                 MCS 28 : Supported
                 MCS 29 : Supported
                 MCS 30 : Supported
                 MCS 31 : Supported
         802.11n Status:
           A-MPDU Tx:
             Priority 0                      : Enabled
             Priority 1                      : Disabled
             Priority 2                      : Disabled
             Priority 3                      : Disabled
             Priority 4                      : Enabled
             Priority 5                      : Enabled
             Priority 6                      : Disabled
             Priority 7                      : Disabled
             Aggregation scheduler           : Enabled
             Realtime timeout                : 10
           A-MSDU Tx:
             Priority 0                      : Enable
             Priority 1                      : Enable
             Priority 2                      : Enable
             Priority 3                      : Enable
             Priority 4                      : Enable
             Priority 5                      : Enable
             Priority 6                      : Disable
             Priority 7                      : Disable
           Guard Interval                    : Any
           Rifs Rx                           : Enabled
         802.11ac                            : Enabled
           Frame burst                       : Automatic
         802.11ac MCS Settings:
         Beacon Interval                     : 100
         CF Pollable mandatory               : Disabled
         CF Poll Request Mandatory           : Disabled
         CFP Period                          : 4
         CFP Maximum Duration                : 60
         Default Channel                     : 36
         Default Tx Power Level              : 1
         DTPC Status                         : Enabled
         Fragmentation Threshold             : 2346
```

```
            RSSI Low Check                          : Disabled
            RSSI Threshold                          : -127 dbm
            Pico-Cell-V2 Status                     : unknown
            TI Threshold                            :
            Legacy Tx Beamforming setting           : Disabled
            Traffic Stream Metrics Status           : Disabled
            Expedited BW Request Status             : Disabled
            EDCA profile type check                 : default-wmm
            Call Admision Control (CAC) configuration
            Voice AC
              Voice AC - Admission control (ACM)    : Disabled
              Voice Stream-Size                     : 84000
              Voice Max-Streams                     : 2
              Voice Max RF Bandwidth                : 75
              Voice Reserved Roaming Bandwidth      : 6
              Voice Load-Based CAC mode             : Enabled
              Voice tspec inactivity timeout        : Enabled
            CAC SIP-Voice configuration
              SIP based CAC                         : Disabled
              SIP call bandwidth                    : 64
              SIP call bandwith sample-size         : 20
            Maximum Number of Clients per AP Radio  : 200


            ----------------- show ap dot11 24ghz txpower -----------------


            Automatic Transmit Power Assignment

            Transmit Power Assignment Mode          : AUTO
            Transmit Power Update Interval          : 600 seconds
            Transmit Power Threshold                : -70 dBm
            Transmit Power Neighbor Count           : 3 APs
            Min Transmit Power                      : -10 dBm
            Max Transmit Power                      : 30 dBm
            Update Contribution
                Noise                               : Enable
                Interference                        : Enable
                Load                                : Disable
                Device Aware                        : Disable
            Transmit Power Assignment Leader        : ewlc-doc (9.12.32.10)
            Last Run                                : 558 seconds ago


            ----------------- show ap dot11 5ghz txpower -----------------


            Automatic Transmit Power Assignment

            Transmit Power Assignment Mode          : AUTO
            Transmit Power Update Interval          : 600 seconds
            Transmit Power Threshold                : -70 dBm
            Transmit Power Neighbor Count           : 3 APs
            Min Transmit Power                      : -10 dBm
            Max Transmit Power                      : 30 dBm
            Update Contribution
                Noise                               : Enable
                Interference                        : Enable
                Load                                : Disable
                Device Aware                        : Disable
            Transmit Power Assignment Leader        : ewlc-doc (9.12.32.10)
            Last Run                                : 558 seconds ago
```

```
----------------- show ap auto-rf dot11 5ghz -----------------


----------------- show ap auto-rf dot11 24ghz -----------------


----------------- show ap config general -----------------



----------------- show ap dot11 5ghz optimized-roaming -----------------

802.11a OptimizedRoaming

  Mode                                : Disabled
  Reporting Interval                  : 90 seconds
  Rate Threshold                      : Disabled
  Hysteresis                          : 6 db


----------------- show ap rf-profile summary -----------------



Number of RF-profiles: 6

RF Profile Name                   Band      Description                                State
------------------------------------------------------------------------------------------
Low_Client_Density_rf_5gh         5 GHz     pre configured Low Client Density rf Up
High_Client_Density_rf_5gh        5 GHz     pre configured High Client Density r Up
Low_Client_Density_rf_24gh        2.4 GHz   pre configured Low Client Density rf Up
High_Client_Density_rf_24gh       2.4 GHz   pre configured High Client Density r Up
Typical_Client_Density_rf_5gh     5 GHz     pre configured Typical Density rfpro Up
Typical_Client_Density_rf_24gh    2.4 GHz   pre configured Typical Client Densit Up


----------------- show ap fra -----------------

FRA State                                   : Disabled
FRA Sensitivity                             : medium (95%)
FRA Interval                                : 1 Hour(s)
  Last Run                                  : 2299 seconds ago
  Last Run time                             : 0 seconds

AP Name           MAC Address       Slot ID  Current-Band      COF %     Suggested Mode
------------------------------------------------------------------------------------------

COF : Coverage Overlap Factor


----------------- show wireless band-select -----------------


Band Select Probe Response  : per WLAN enabling
Cycle Count                 : 2
Cycle Threshold (millisec)  : 200
Age Out Suppression (sec)   : 20
Age Out Dual Band (sec)     : 60
Client RSSI (dBm)           : -80
Client Mid RSSI (dBm)       : -80
```

```
------------------ show wireless  country  configure ------------------


Configured Country.........................   US - United States
Configured Country Codes
        US  - United States                 802.11a Indoor/ 802.11b Indoor/ 802.11g Indoor


------------------ show wireless tag rf summary ------------------


Number of RF Tags: 1

RF tag name                       Description
-------------------------------------------------------------------
default-rf-tag                    default RF tag


------------------ show ap tag summary ------------------


Number of APs: 0


------------------ show ap status ------------------


------------------ show ap uptime ------------------


Number of APs: 0
```

show tunnel eogre global-configuration

To display the Ethernet over GRE (EoGRE) global configuration, use the **show tunnel eogre global-configuration** command.

show tunnel eogre global-configuration

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to display the EoGRE global configuration:

```
Device# show tunnel eogre global-configuration

Heartbeat interval      : 60
Max Heartbeat skip count : 3
Source Interface        : (none)
```

show tunnel eogre domain detailed

To display the detailed information of the Ethernet over GRE (EoGRE) tunnel domain, use the **show tunnel eogre domain detailed** command.

show tunnel eogre domain detailed *domain-name*

Syntax Description

domain-name	EoGRE domain name.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to display the detailed information of the EoGRE tunnel domain:

```
Device# show tunnel eogre domain detailed eogre_domain

Domain Name    : eogre_domain
 Primary GW    : Tunnel1
 Secondary GW  : Tunnel2
 Active GW     : Tunnel1
 Redundancy    : Non-Revertive
```

show tunnel eogre domain summary

To display the summary information of the Ethernet over GRE (EoGRE) tunnel domain, use the **show tunnel eogre domain summary** command.

show tunnel eogre domain summary

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to display the summary information of the EoGRE tunnel domain:

```
Device# show tunnel eogre domain summary

Domain Name        Primary GW    Secondary GW      Active GW      Redundancy
--------------------------------------------------------------------------
domain1            Tunnel1       Tunnel2           Tunnel1        Non-Revertive
eogre_domain       Tunnel1       Tunnel2           Tunnel1        Non-Revertive
```

show tunnel eogre gateway summary

To display the summary information of the Ethernet over GRE (EoGRE) tunnel gateway, use the **show tunnel eogre gateway summary** command.

show tunnel eogre gateway summary

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to display the summary information of the EoGRE tunnel gateway:

```
Device# show tunnel eogre gateway summary

Name            Type  Address                                   AdminState  State  Clients
-------------------------------------------------------------------------------------------
Tunnel1         IPv4  9.51.1.11                                 Up          Up     0

Tunnel2         IPv4  9.51.1.12                                 Up          Down   0

Tunnel10        IPv6  fd09:9:8:21::90                           Down        Down   0

Tunnel11        IPv4  9.51.1.11                                 Up          Up     0

Tunnel12        IPv6  fd09:9:8:21::90                           Up          Down   0

Tunnel100       IPv4  9.51.1.100                                Up          Down   0
```

show tunnel eogre gateway detailed

To display the detailed information of the Ethernet over GRE (EoGRE) tunnel domain, use the **show tunnel eogre gateway detailed** command.

show tunnel eogre gateway detailed *gateway-name*

Syntax Description

gateway-name	EoGRE gateway name.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to display the detailed information of the EoGRE tunnel gateway:

```
Device# show tunnel eogre domain detailed Tunnel1

Gateway : Tunnel1
 Mode    : IPv4
 IP      : 9.51.1.11
 Source : Vlan51 / 9.51.1.1
 State   : Up
 SLA ID : 56
 MTU     : 1480
 Up Time: 4 minutes 45 seconds

Clients
 Total Number of Wireless Clients      : 0
Traffic
 Total Number of Received Packets      : 0
 Total Number of Received Bytes        : 0
 Total Number of Transmitted Packets   : 0
 Total Number of Transmitted Bytes     : 0
Keepalives
 Total Number of Lost Keepalives       : 0
 Total Number of Received Keepalives   : 5
 Total Number of Transmitted Keepalives: 5
 Windows                               : 1
 Transmitted Keepalives in last window : 2
 Received Keepalives in last window    : 2
```

show tunnel eogre manager stats global

To display the global tunnel manager statistics, use the **show tunnel eogre manager stats global** command.

show tunnel eogre manager stats global

Syntax Description

This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to display the global tunnel manager statistics:

```
Device# show tunnel eogre manager stats global

Tunnel Global Statistics
Last Updated                   : 02/18/2019 23:50:35
EoGRE Objects
  Gateways                     : 6
  Domains                      : 2

EoGRE Flex Objects
  AP Gateways                  : 2
  AP Domains                   : 1
  AP Gateways HA inconsistencies : 0
  AP Domains HA inconsistencies  : 0

Config events
  IOS Tunnel updates           : 806
  IOS Domain updates           : 88
  Global updates               : 48
  Tunnel Profile updates       : 120
  Tunnel Rule updates          : 16
  AAA proxy key updates        : 0

AP events
  Flex AP Join                 : 1
  Flex AP Leave                : 0
  Local AP Join                : 0
  Local AP leave               : 0
  Tunnel status (rx)           : 4
  Domain status (rx)           : 1
  IAPP stats msg (rx)          : 3
  Client count (rx)            : 6
  VAP Payload msg (tx)         : 4
  Domain config (tx)           : 1
  Global config (tx)           : 1
  Client delete (tx)           : 1
```

```
     Client delete per domain (tx)  : 3
     DHCP option 82 (tx)            : 4

 Client events
   Add-mobile                       : 2
   Run-State                        : 3
   Delete                           : 1
   Cleanup                          : 0
   Join                             : 2
   Plumb                            : 0
   Join Errors                      : 0
   HandOff                          : 0
   MsPayload                        : 2
   FT Recover                       : 0
   Zombie GW counter increase       : 0
   Zombie GW counter decrease       : 0
   Tunnel Profile reset             : 88
   Client deauth                    : 0
   HA reconciliation                : 0

 Client Join Events
   Generic Error                    : 0
   MSPayload Fail                   : 0
   Invalid VLAN                     : 0
   Invalid Domain                   : 0
   No GWs in Domain                 : 0
   Domain Shut                      : 0
   Invalid GWs                      : 0
   GWs Down                         : 0
   Rule Match Error                 : 0
   AAA-override                     : 0
   Flex No Active GW                : 0
   Open Auth join attempt           : 2
   Dot1x join attempt               : 2
   Mobility join attempt            : 0
   Tunnel Profile not valid         : 2
   Tunnel Profile valid             : 2
   No rule match                    : 0
   Rule match                       : 2
   AAA proxy                        : 0
   AAA proxy accounting             : 0
   AAA eogre attributes             : 0
   Has aaa override                 : 0
   Error in handoff payload         : 0
   Handoff AAA override             : 0
   Handoff no AAA override          : 0
   Handoff payload received         : 0
   Handoff payload sent             : 0

 SNMP Traps
   Client                           : 0
   Tunnel                           : 2
   Domain                           : 0

 IPC
   IOSd TX messages                 : 0

 Zombie Client
   Entries                          : 0
```

show tunnel eogre manager stats instance

To display the tunnel manager statistics for a specific WNCd instance, use the **show tunnel eogre manager stats instance** command.

show tunnel eogre manager stats instance *instance-number*

Syntax Description

instance-number	WNCd instance number.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to display the tunnel manager statistics for a specific WNCd instance:

```
Device# show tunnel eogre manager stats instance 0

Tunnel Manager statistics for process instance : 0
Last Updated                 : 02/18/2019 23:50:35
EoGRE Objects
  Gateways                   : 6
  Domains                    : 2

EoGRE Flex Objects
  AP Gateways                : 2
  AP Domains                 : 1
  AP Gateways HA inconsistencies : 0
  AP Domains HA inconsistencies  : 0

Config events
  IOS Tunnel updates         : 102
  IOS Domain updates         : 11
  Global updates             : 6
  Tunnel Profile updates     : 15
  Tunnel Rule updates        : 2
  AAA proxy key updates      : 0

AP events
  Flex AP Join               : 1
  Flex AP Leave              : 0
  Local AP Join              : 0
  Local AP leave             : 0
  Tunnel status (rx)         : 4
  Domain status (rx)         : 1
  IAPP stats msg (rx)        : 3
  Client count (rx)          : 6
  VAP Payload msg (tx)       : 4
```

```
                      Domain config (tx)           : 1
                      Global config (tx)           : 1
                      Client delete (tx)           : 1
                      Client delete per domain (tx) : 3
                      DHCP option 82 (tx)          : 4

                    Client events
                      Add-mobile                   : 2
                      Run-State                    : 3
                      Delete                       : 1
                      Cleanup                      : 0
                      Join                         : 2
                      Plumb                        : 0
                      Join Errors                  : 0
                      HandOff                      : 0
                      MsPayload                    : 2
                      FT Recover                   : 0
                      Zombie GW counter increase   : 0
                      Zombie GW counter decrease   : 0
                      Tunnel Profile reset         : 11
                      Client deauth                : 0
                      HA reconciliation            : 0

                    Client Join Events
                      Generic Error                : 0
                      MSPayload Fail               : 0
                      Invalid VLAN                 : 0
                      Invalid Domain               : 0
                      No GWs in Domain             : 0
                      Domain Shut                  : 0
                      Invalid GWs                  : 0
                      GWs Down                     : 0
                      Rule Match Error             : 0
                      AAA-override                 : 0
                      Flex No Active GW            : 0
                      Open Auth join attempt       : 2
                      Dot1x join attempt           : 2
                      Mobility join attempt        : 0
                      Tunnel Profile not valid     : 2
                      Tunnel Profile valid         : 2
                      No rule match                : 0
                      Rule match                   : 2
                      AAA proxy                    : 0
                      AAA proxy accounting         : 0
                      AAA eogre attributes         : 0
                      Has aaa override             : 0
                      Error in handoff payload     : 0
                      Handoff AAA override         : 0
                      Handoff no AAA override      : 0
                      Handoff payload received     : 0
                      Handoff payload sent         : 0

                    SNMP Traps
                      Client                       : 0
                      Tunnel                       : 2
                      Domain                       : 0

                    IPC
                      IOSd TX messages             : 0

                    Zombie Client
                      Entries                      : 0
```

show umbrella config

To view the Umbrella configuration details, use the **show umbrella config** command.

show umbrella config

Syntax Description

This command has no arguments.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the Umbrella configuration details:

```
Device# show umbrella config
Umbrella Configuration
========================
   Token: 57CC80106C087FB1B2A7BAB4F2F4373C00247166
   OrganizationID: 1892929
   Local Domain Regex parameter-map name: dns_wl
   DNSCrypt: Enabled
   Public-key: B735:1140:206F:225D:3E2B:D822:D7FD:691E:A1C3:3CC8:D666:8D0C:BE04:BFAB:CA43:FB79

   UDP Timeout: 2 seconds
   Resolver address:
       1. 208.67.220.220
       2. 208.67.222.222
       3. 2620:119:53::53
       4. 2620:119:35::35
```

show umbrella deviceid

To view the device registration details, use the **show umbrella deviceid** command.

show   umbrella   deviceid

Syntax Description

This command has no arguments.

Command Default
None

Command Modes
Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the device registration details:

```
Device# show umbrella deviceid
Device registration details
Profile Name          Tag               Status              Device-id
GigabitEthernet0/0/0   guest            200 SUCCESS        010a470b042a072d
```

show umbrella deviceid detailed

To view the detailed description for the Umbrella device ID, use the **show umbrella deviceid detailed** command.

show   umbrella   deviceid   *detailed*

Syntax Description	This command has no arguments.

Command Default   None

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the detailed description for the Umbrella device ID:

```
Device# show umbrella deviceid detailed
Device registration details
 1.GigabitEthernet0/0/0
      Tag              : guest
      Device-id        : 010a470b042a072d
      Description      : Device Id recieved successfully
```

show umbrella dnscrypt

To view the Umbrella DNScrypt details, use the **show umbrella dnscrypt** command.

show umbrella dnscrypt

Syntax Description   This command has no arguments.

Command Default   None

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the Umbrella DNScrypt details:

```
Device# show umbrella dnscrypt
DNSCrypt: Enabled
  Public-key: B735:1140:206F:225D:3E2B:D822:D7FD:691E:A1C3:3CC8:D666:8D0C:BE04:BFAB:CA43:FB79

  Certificate Update Status:
      Last Successfull Attempt: 17:45:57 IST Nov 9 2017
  Certificate Details:
      Certificate Magic     : DNSC
      Major Version         : 0x0001
      Minor Version         : 0x0000
      Query Magic           : 0x713156774457306E
      Serial Number         : 1490391488
      Start  Time           : 1490391488 (03:08:08 IST Mar 25 2017)
      End Time              : 1521927488 (03:08:08 IST Mar 25 2018)
      Server Public Key     :
E7F8:4477:BF89:1434:1ECE:23F0:D6A6:6EB9:4F45:3167:D71F:80BB:4E80:A04F:F180:F778
      Client Secret Key Hash:
F1A5:1993:F729:5416:53B7:94E3:6509:8182:A708:0561:8050:6CE0:DFA1:5C94:6EE4:0010
      Client Public key     :
BC6D:3758:48B6:120B:D2F5:F25B:2979:564D:F52C:5EFA:B0BD:76FE:3CD6:828B:44D2:FF3A
      NM key Hash           :
1FF7:2E1E:EFB9:7987:9CB4:3EF8:A25B:4DAD:10FC:7DF7:6985:6E8E:6E4D:D56A:1C70:B9EB
```

show vlan

To display the parameters for all configured VLANs or one VLAN (if the VLAN ID or name is specified) on the switch, use the **show vlan** command in user EXEC mode.

show vlan [**brief** | **group** | **id** *vlan-id* | **mtu** | **name** *vlan-name* | **remote-span** | **summary**]

Syntax Description		
	brief	(Optional) Displays one line for each VLAN with the VLAN name, status, and its ports.
	group	(Optional) Displays information about VLAN groups.
	id *vlan-id*	(Optional) Displays information about a single VLAN identified by the VLAN ID number. For *vlan-id*, the range is 1 to 4094.
	mtu	(Optional) Displays a list of VLANs and the minimum and maximum transmission unit (MTU) sizes configured on ports in the VLAN.
		Note Traceback occurs in the VLAN CLI parser when Controller-PI does VLAN lookup for each interface.
	name *vlan-name*	(Optional) Displays information about a single VLAN identified by the VLAN name. The VLAN name is an ASCII string from 1 to 32 characters.
	remote-span	(Optional) Displays information about Remote SPAN (RSPAN) VLANs.
	summary	(Optional) Displays VLAN summary information.

Note The **ifindex** keyword is not supported, even though it is visible in the command-line help string.

Command Default	None
Command Modes	User EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines In the **show vlan mtu** command output, the MTU_Mismatch column shows whether all the ports in the VLAN have the same MTU. When yes appears in the column, it means that the VLAN has ports with different MTUs, and packets that are switched from a port with a larger MTU to a port with a smaller MTU might be dropped. If the VLAN does not have an SVI, the hyphen (-) symbol appears in the SVI_MTU column. If the MTU-Mismatch column displays yes, the names of the ports with the MinMTU and the MaxMTU appear.

This is an example of output from the **show vlan** command. See the table that follows for descriptions of the fields in the display.

```
Device> show vlan
VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Gi1/0/2, Gi1/0/3, Gi1/0/4
                                                Gi1/0/5, Gi1/0/6, Gi1/0/7
                                                Gi1/0/8, Gi1/0/9, Gi1/0/10
                                                Gi1/0/11, Gi1/0/12, Gi1/0/13
                                                Gi1/0/14, Gi1/0/15, Gi1/0/16
                                                Gi1/0/17, Gi1/0/18, Gi1/0/19
                                                Gi1/0/20, Gi1/0/21, Gi1/0/22
                                                Gi1/0/23, Gi1/0/24, Gi1/0/25
                                                Gi1/0/26, Gi1/0/27, Gi1/0/28
                                                Gi1/0/29, Gi1/0/30, Gi1/0/31
                                                Gi1/0/32, Gi1/0/33, Gi1/0/34
                                                Gi1/0/35, Gi1/0/36, Gi1/0/37
                                                Gi1/0/38, Gi1/0/39, Gi1/0/40
                                                Gi1/0/41, Gi1/0/42, Gi1/0/43
                                                Gi1/0/44, Gi1/0/45, Gi1/0/46
                                                Gi1/0/47, Gi1/0/48
2    VLAN0002                         active
40   vlan-40                          active
300  VLAN0300                         active
1002 fddi-default                     act/unsup
1003 token-ring-default               act/unsup
1004 fddinet-default                  act/unsup
1005 trnet-default                    act/unsup

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
2    enet  100002     1500  -      -      -        -    -        0      0
40   enet  100040     1500  -      -      -        -    -        0      0
300  enet  100300     1500  -      -      -        -    -        0      0
1002 fddi  101002     1500  -      -      -        -    -        0      0
1003 tr    101003     1500  -      -      -        -    -        0      0
1004 fdnet 101004     1500  -      -      -        ieee -        0      0
1005 trnet 101005     1500  -      -      -        ibm  -        0      0
2000 enet  102000     1500  -      -      -        -    -        0      0
3000 enet  103000     1500  -      -      -        -    -        0      0

Remote SPAN VLANs
------------------------------------------------------------------------------
2000,3000

Primary Secondary Type              Ports
------- --------- ----------------- ----------------------------------------
```

Table 26: show vlan Command Output Fields

Field	Description
VLAN	VLAN number.
Name	Name, if configured, of the VLAN.
Status	Status of the VLAN (active or suspend).
Ports	Ports that belong to the VLAN.

Field	Description
Type	Media type of the VLAN.
SAID	Security association ID value for the VLAN.
MTU	Maximum transmission unit size for the VLAN.
Parent	Parent VLAN, if one exists.
RingNo	Ring number for the VLAN, if applicable.
BrdgNo	Bridge number for the VLAN, if applicable.
Stp	Spanning Tree Protocol type used on the VLAN.
BrdgMode	Bridging mode for this VLAN—possible values are source-route bridging (SRB) and source-route transparent (SRT); the default is SRB.
Trans1	Translation bridge 1.
Trans2	Translation bridge 2.
Remote SPAN VLANs	Identifies any RSPAN VLANs that have been configured.

This is an example of output from the **show vlan summary** command:

```
Device> show vlan summary
Number of existing VLANs            : 45
 Number of existing VTP VLANs       : 45
 Number of existing extended VLANS  : 0
```

This is an example of output from the **show vlan id** command:

```
Device# show vlan id 2
VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
2    VLAN0200                         active    Gi1/0/7, Gi1/0/8
2    VLAN0200                         active    Gi2/0/1, Gi2/0/2

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
2    enet  100002     1500  -      -      -        -    -        0      0

Remote SPAN VLANs
-------------------------------------------------------------------------------
Disabled
```

show vlan access-map

To display information about a particular VLAN access map or for all VLAN access maps, use the **show vlan access-map** command in privileged EXEC mode.

show vlan access-map [*map-name*]

Syntax Description	*map-name*	(Optional) Name of a specific VLAN access map.

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This is an example of output from the **show vlan access-map** command:

```
Device# show vlan access-map
Vlan access-map "vmap4"  10
  Match clauses:
    ip  address: al2
  Action:
    forward
Vlan access-map "vmap4"  20
  Match clauses:
    ip  address: al2
  Action:
    forward
```

show vlan filter

To display information about all VLAN filters or about a particular VLAN or VLAN access map, use the **show vlan filter** command in privileged EXEC mode.

show vlan filter {**access-map** *name* | **vlan** *vlan-id*}

Syntax Description		
access-map *name*	(Optional) Displays filtering information for the specified VLAN access map.	
vlan *vlan-id*	(Optional) Displays filtering information for the specified VLAN. The range is 1 to 4094.	

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This is an example of output from the **show vlan filter** command:

```
Device# show vlan filter
VLAN Map map_1 is filtering VLANs:
 20-22
```

show vlan group

To display the VLANs that are mapped to VLAN groups, use the **show vlan group** command in privileged EXEC mode.

show vlan group [**group-name** *vlan-group-name* [**user_count**]]

Syntax Description	**group-name** *vlan-group-name*	(Optional) Displays the VLANs mapped to the specified VLAN group.
	user_count	(Optional) Displays the number of users in each VLAN mapped to a specified VLAN group.

Command Default   None

Command Modes   Privileged EXEC

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   The **show vlan group** command displays the existing VLAN groups and lists the VLANs and VLAN ranges that are members of each VLAN group. If you enter the **group-name** keyword, only the members of the specified VLAN group are displayed.

This example shows how to display the members of a specified VLAN group:

show vrrp events

To display Virtual Router Redundancy Protocol (VRRP) events, use the **show vrrp events** command.

show vrrp events

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Usage Guidelines   VRRP commands are displayed only in ME mode; it is hidden in other AP modes.

Examples   This example shows how to view the VRRP events:

```
Device# show vrrp events

VRRP Events:
Dec 7 2019 01:17:23: Current state : backup, My Eth : A4:53:0E:7B:CD:84, event : VRRP Element
 is started. Start
sending KeepAlive Pkts to check if Ether link is up
Dec 7 2019 01:17:28: Current state : backup, My Eth : A4:53:0E:7B:CD:84, event : Detected
Link is up. Now
waiting for 30 seconds to participate in VRRP election
Dec 7 2019 01:18:01: Current state : master, My Eth : A4:53:0E:7B:CD:84, event : Current
master
(00:00:00:00:00:00) went down (lost 3 advertisement). Moving to master state. And starting
 election
Dec 7 2019 01:18:05: Current state : master, My Eth : A4:53:0E:7B:CD:84, event : Launched
controller process on
this ap
```

show vrrp statistics

To display the Virtual Router Redundancy Protocol (VRRP) statistics, use the **show vrrp statistics** command in privileged EXEC mode.

show vrrp statistics

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Usage Guidelines   VRRP commands are displayed only in ME mode; it is hidden in other AP modes.

Examples   This example shows how to view the VRRP statistics:

```
Device# show vrrp statistics

VRRP Statistics :
VRRP Statistics :
Invalid VRRP packets recvd:0
Number of incoming VRRP Pkts:0
Number of VRRP Pkts transmitted:148054
Number of VRRP Pkts recvd from Master:0
Number of VRRP Pkts recvd in Init state:0
Number of VRRP Pkts with STOP Priority:0
```

show vrrp status

To display the Virtual Router Redundancy Protocol (VRRP) status, use the **show vrrp status** command.

show vrrp status

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Usage Guidelines

VRRP commands are displayed only in ME mode; it is hidden in other AP modes.

Examples

This example shows how to view the VRRP status:

```
Device# show vrrp status

 VRRP Status : MASTER
Preferred AP : 00:00:00:00:00:00
My Eth : A4:53:0E:7B:CD:84
AP Type : VANCOUVER
VRRP Instance : vrid state priority vrrp_ip_vlans adver_ival
1 master 1 0.0.0.0:0 3.000000
```

show wireless stats ap history

To verify historical statistics of an AP, use the **show wireless stats ap history** command.

show wireless stats ap history

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC#

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Examples   This example shows how to verify the statistics of the access point hisory:

```
Device# show wireless stats ap history
AP Name             Radio MAC       Event       Time             Recent       Disconnect
Reason         Disconnect
                                                                 Disconnect   Reason
               Count
                                                                 Time
----------------------------------------------------------------------------------------------------
APA023.9FD8.EA22   40ce.24bf.8ca0  Joined      06/26/21 10:11:52 NA           NA
               NA
APA023.9FD8.EA22   40ce.24bf.8ca0  Disjoined   06/26/21 10:05:18 NA           Heart beat
timer expiry    1
APA023.9FD8.EA22   40ce.24bf.8ca0  Joined      06/22/21 17:00:39 NA           NA
               NA
APA023.9FD8.EA22   40ce.24bf.8ca0  Disjoined   06/22/21 16:54:54 NA           Heart beat
timer expiry    1
APA023.9FD8.EA22   40ce.24bf.8ca0  Joined      06/21/21 23:01:17 NA           NA
               NA
APA023.9FD8.EA22   40ce.24bf.8ca0  Disjoined   06/21/21 22:56:21 NA           Image Download
 Success       1
```

show wireless stats ap join summary

To verify the statistics of the access point join summary, use the **show wireless stats ap join summary** command.

show wireless stats ap join summary

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Examples   This example shows how to verify the statistics of the access point join summary:

```
Device# show wireless stats ap join summary
Number of APs: 001

Base MAC        Ethernet MAC    AP Name           IP Address  Status  Last         Last
                                                                       Failure Phase
Disconnect Reason
--------------------------------------------------------------------------------------------
002a.1075.47c0  002a.104d.c9fc  AP002a.104d.c9fc  8.9.10.222  Joined  Run          High
 CPU usage
003a.1475.57c0  002a.104d.c9fc  AP003a.144d.59fc  7.8.09.111  Joined  Run          High
 Memory usage
```

show wireless stats ap join summary sort

To view the sorted wireless statistics access point (AP) join summary, use the **show wireless stats ap join summary sort** command.

show wireless stats ap join summary sort

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Usage Guidelines

Wireless AP statistics can be sorted in ascending or descending order by AP name.

- Ascending: Displays the ten APs from the bottom.

- Descending: Displays the APs from the top.

- Name: Displays the APs list sorted by name.

Examples

This example shows how to view the sorted wireless statistics AP join summary:

```
Device# show wireless stats ap join summary sort
Number of APs: 8

Base MAC        Ethernet MAC      AP Name                         IP Address    Status
Last Failure Phase Last Disconnect Reason
--------------------------------------------------------------------------------------
7872.5dee.4960  7872.5ded.cb74    4800-abcdefghijklmnopqrstuvwxyz1  1.11.22.11  Joined
Image-Download      Image Download Success
10f9.2077.6140  10f9.2076.2c58    9105-abcdefghijklmnopqrstuvwxyz1  1.11.22.11  Joined
Image-Download      Image Download Success
00ee.ab18.bf00  7069.5a74.9670    9115-abcdefghijklmnopqrstuvwxyz1  1.11.22.11  Joined
Image-Download      Image Download Success
1416.9d82.ef40  2c57.4152.5e60    9130-abcdefghijklmnopqrstuvwxyz1  1.11.22.11  Joined
Image-Download      Image Download Success
00d7.8f4e.7040  002a.1087.d68a    AP2800                            1.11.22.11  Joined
Config              DTLS close alert from peer
687d.b45e.3ed0  687d.b45c.0554    AP687D.B45C.0554                  1.11.22.11  Joined
Image-Download      Image Download Success
687d.b45e.4c50  687d.b45c.0674    AP687D.B45C.0674                  1.11.22.11  Joined
Config              DTLS close alert from peer
687d.b45e.53d0  687d.b45c.0714    AP687D.B45C.0714                  1.11.22.11  Joined
Config              DTLS close alert from peer
```

show wireless stat redundancy statistics client-recovery mobilityd

To view the statistics of Mobilityd configuration database, use the **show wireless stat redundancy statistics client-recovery mobilityd** command.

show wireless stat redundancy statistics client-recovery mobilityd

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Examples   The following example shows how to view the statistics of Mobilityd configuration database:

```
Device# show wireless stat redundancy statistics client-recovery mobilityd

Mobility Client Deletion Reason Statistics
------------------------------------------
Mobility Incomplete State        : 0
Inconsistency in WNCD & Mobility : 0
Partial Delete                   : 0
General statistics
-------------------
```

show wireless stat redundancy statistics client-recovery sisf

To view the statistics for Switch Integrated Security Features (SISF) configuration database, use the **show wireless stat redundancy statistics client-recovery sisf** command.

show wireless stat redundancy statistics client-recovery sisf

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Examples   The following example shows how to view the statistics for SISF configuration database:

```
Device# show wireless stat redundancy statistics client-recovery sisf
Client SSO statistics for SISF
------------------------------
Number of recreate attempted post switchover   : 0
Number of recreate succeeded post switchover   : 0
Number of recreate failed because of no mac    : 0
Number of recreate failed because of no ip     : 0
Number of ipv4 entry recreate success          : 0
Number of ipv4 entry recreate failed           : 0
Number of ipv6 entry recreate success          : 0
Number of ipv6 entry recreate failed           : 0
Number of partial delete received              : 0
Number of client purge attempted               : 0
Number of heap and db entry purge success      : 0
Number of purge success for db entry only      : 0
Number of client purge failed                  : 0
Number of garp sent                            : 0
Number of garp failed                          : 0
Number of IP table create callbacks on standby  : 0
Number of IP table modify callbacks on standby  : 0
Number of IP table delete callbacks on standby  : 0
Number of MAC table create callbacks on standby : 0
Number of MAC table modify callbacks on standby : 0
Number of MAC table delete callbacks on standby : 0
```

show wireless stat redundancy client-recovery wncd

To view the redundancy configuration statistics for all the Wireless Network Control Daemon (WNCd) instances, use the **show wireless stat redundancy client-recovery wncd** command.

show wireless stat redundancy client-recovery wncd { *instance-id* | **all** }

Syntax Description		
	instance-id	Instance ID. Valid values range from 0 to 7.
	all	Specifies the statistics for all WNCd instances.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Examples

The following example shows how to view the redundancy configuration statistics for all the WNCd instances:

```
Device# show wireless stat redundancy statistics client-recovery wncd all

Client SSO statistics
---------------------
No. of Clients                             : 0
No. of Clients recovered successfully      : 0
No. of Clients failed to recover           : 0
No. of Reconcile messages received from AP : 0
WNCD instance  : 0
Reconcile messages received from AP                  : 0
Reconcile clients received from AP                   : 0
Recreate attempted post switchover                   : 0
Recreate attempted by SANET                          : 0
Recreate attempted by DOT1x                          : 0
Recreate attempted by SISF                           : 0
Recreate attempted by SVC CO                         : 0
Recreate attempted by Unknown module                 : 0
Recreate succeeded post switchover                   : 0
Recreate Failed post switchover                      : 0
Recreate Failure in mmif                             : 0
Recreate Failure in co                               : 0
Recreate Failure in sanet                            : 0
Recreate Failure in authmgr                          : 0
Recreate Failure in dot1x                            : 0
Recreate Failure in mab                              : 0
Recreate Failure in sanet_accounting                 : 0
Recreate Failure in sisf                             : 0
Recreate Failure in web auth                         : 0
Recreate Failure in lisp                             :
Recreate Failure in ipv6                             : 0
Recreate Failure in qos                              : 0
```

show wireless band-select

To display the status of the band-select configuration, use the **show wireless band-select** command in privileged EXEC mode.

show   wireless   band-select

Syntax Description   This command has no arguments or keywords.

Command Default   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

The following is sample output from the **show wireless band-select** command:

```
Device# show wireless band-select
Band Select Probe Response   : per WLAN enabling
Cycle Count                  : 2
Cycle Threshold (millisec)   : 200
Age Out Suppression (sec)    : 20
Age Out Dual Band (sec)      : 60
Client RSSI (dBm)            : 80
```

show wireless client

To see the summary of the classified devices, use the **show wireless client** command.

show wireless client device {**cache** | **count** | **summary** } | {**steering**} [**chassis** {*chassis-number* | **active** | **standby** }]**R0**

Syntax Description		
	device	Shows classified devices.
	steering	Wireless client steering information
	cache	Shows the cached classified device summary.
	count	Shows the wireless device count.
	summary	Shows the active classified device summary.
	chassis-number	Chassis number. Valid range is 1–2.
	active	Active instance.
	standby	Standby instance.
	R0	Route-Processor slot 0.

Command Default	None
Command Modes	Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the summary of the classified devices:

```
Device# show wireless client device summary
```

show wireless client mac-address

To view detailed information of a client using its mac-address, use the **show wireless client mac-addressdetail** command.

show wireless client mac-address *mac-address* **detail** [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description		
mac-address	Client MAC address.
chassis-number	Chassis number. Valid range is 1–2.
active	Active instance.
standby	Standby instance.
R0	Route-Processor slot 0.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines The Client Scan Reports section in the output of the **show wireless client mac-address detail** is populated only for the following Apple devices:

- Any iPhone 7 and running iOS 11.0 or higher

- Any iPad after iPad Pro (1st gen, 12.9-inch, 2015) and running iOS 11.0 or higher

Other client devices, even if it supports 802.11k or is Wi-Fi Agile Multiband (MBO) certified, are not currently supported to populate the Client Scan Reports section.

Client ACLs shown under **show wireless client mac-address** *<mac address>* **detail** are ACLs applied on the client in Flexconnect local authentication case with MAB+Web authentication WLAN with AAA override enabled. This is applicable only for Express Wi-Fi by Facebook Policy on Controller. For more information about Facebook policy, see Express Wi-Fi by Facebook.

From Cisco IOS XE Amsterdam 17.3.1 onwards, the controller retains client session for 10 seconds. This feature is applicable for clients in the RUN state and is supported on central authentication with local and flex mode.

In idle state, 10 sec represents idle state timeout and 09 sec represent remaining time out of 10 sec. An example is given below:

```
Idle state timeout : 10 sec (Remaining time: 09 sec)
```

Examples

The following example shows how to see detailed client information using its MAC address:

```
Device# show wireless client mac-address 98-XX-7B-XX-EF-XX detail
```

show wireless client mac-address (Call Control)

To view call control information related to clients, use the **show wireless client mac-address** command in privileged EXEC mode.

show wireless client mac-address *mac-address* **call-control call-info**

Syntax Description

mac-address	The client MAC address.
call-control call-info	Displays the call control and IP-related information about a client.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to display call control and IP-related information about a client:

```
Device# show wireless client mac-address  30e4.db41.6157 call-control call-info
Client MAC Address       : 30E4DB416157

Call 1 Statistics

Uplink IP Address        : 209.165.200.225
Downlink IP Address      : 209.165.200.226
Uplink Port              : 29052
Downlink Port            : 27538
Call ID                  : c40acb4d-3b3b0.3d27da1e-356bed03
Called Party             : sip:1011
Calling Party            : sip:1012
Priority                 : 6
Call On Hold             : false
Call Duration            : 30

Call 2 Statistics

No Active Call
```

show wireless client mac-address (TCLAS)

To view information about TCLAS and user priority, use the **show wireless client mac-address** command in privileged EXEC mode.

show wireless client mac-address *mac-address* **tclas**

Syntax Description	*mac-address*	The client MAC address.
	tclas	Displays TCLAS and user priority-related information about a client.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to display the TCLAS and user priority-related information about a client:

```
Device# show wireless client mac-address 30e4.db41.6157 tclas
MAC Address      UP TID Mask Source IP Addr  Dest IP Addr    SrcPort DstPort Proto
-------------------------------------------------------------------------------
30e4.db41.6157    4   4   95 167838052       2164326668      5060    5060       6
30e4.db41.6157    6   1   31 0               2164326668      0       27538     17
```

show wireless client mac-address mobility history

To see roam history of an active client in subdomain, use the **show wireless client mac-address** *mac-address* **mobility history** command.

show wireless client mac-address *mac-address* **mobility history**[**chassis** {*chassis-number* | **active** | **standby**} **R0**] | **events** [**chassis** {*chassis-number* | **active** | **standby**} **R0**]]

Syntax Description	*mac-address*	MAC address of the client.
	chassis-number	Chassis number as either 1 or 2.
	active R0	Active instance of the client in Route-processor slot 0.
	standby R0	Standby instance of the client in Route-processor slot 0.
	events	Shows client FSM event history.

Command Default	None

Command Modes	Privileged EXEC

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

This example shows how to see roam history of an active client in subdomain:

```
Device# show wireless client mac-address 00:0d:ed:dd:35:80 mobility history
```

show wireless client summary

To display a summary of active clients associated with the controller, use the **show wireless client summary** command in privileged EXEC mode.

show   wireless   client   summary

Syntax Description	This command has no arguments or keywords.
Command Default	No default behavior or values.
Command Modes	Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

The following is sample output from the **show wireless client summary** command:

Use the **show wireless exclusionlist** command to display clients on the exclusion list.

```
Device# show wireless client summary

Number of Clients: 1

MAC Address       AP Name               Type ID  State  Protocol  Method  Role
-------------------------------------------------------------------------------
6c40.0899.0466    9115i-r4-sw2-te1-0-37  WLAN 7  Run    11ac      None    Local
```

show wireless client timers

To display 802.11 system timers, use the **show wireless client timers** command in privileged EXEC mode.

show wireless client timers

Syntax Description   This command has no arguments or keywords.

Command Default   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

The following is sample output from the **show wireless client timers** command:

```
Device# show wireless client timers
 Authentication Response Timeout (seconds)     : 10
```

show wireless country

To display the configured country and the radio types supported, use the **show wireless country** command in privileged EXEC mode.

show wireless country {**channels** | **configured** | **supported** [**tx-power**]}

Syntax Description

channels	Displays the list of possible channels for each band, and the list of channels allowed in the configured countries.
configured	Display configured countries.
supported tx-power	Displays the list of allowed Tx powers in each supported country.

Command Default No default behavior or values.

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

The following is sample output from the **show wireless country channels** command:

```
Device# show wireless country channels
  Configured Country............................: US  - United States
      KEY: * = Channel is legal in this country and may be configured manually.
           A = Channel is the Auto-RF default in this country.
           . = Channel is not legal in this country.
           C = Channel has been configured for use by Auto-RF.
           x = Channel is available to be configured for use by Auto-RF.
      (-,-) = (indoor, outdoor) regulatory domain allowed by this country.
----------------:+-+-+-+-+-+-+-+-+-+-+-+-+-
    802.11bg    :
    Channels    :                 1 1 1 1 1
                : 1 2 3 4 5 6 7 8 9 0 1 2 3 4
----------------:+-+-+-+-+-+-+-+-+-+-+-+-+-
 (-A   ,-AB  )  US :   A * * * * A * * * * A . . .
 Auto-RF        : . . . . . . . . . . . . . .
----------------:+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-
 802.11a        :                     1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
 Channels       : 3 3 3 4 4 4 4 4 5 5 6 6 0 0 0 1 1 2 2 2 3 3 4 4 5 5 6 6
                : 4 6 8 0 2 4 6 8 2 6 0 4 0 4 8 2 6 0 4 8 2 6 0 9 3 7 1 5
----------------:+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-
 (-A   ,-AB  )  US :   . A . A . A . A A A A A * * * * . . . * * * A A A A *
 Auto-RF        : . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
----------------:+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-
 4.9GHz 802.11a :
    Channels    :                 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2
                : 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
----------------:+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-
 US (-A   ,-AB  ): * * * * * * * * * * * * * * * * * * * * A * * * * A
 Auto-RF        : . . . . . . . . . . . . . . . . . . . . . . . . . .
----------------:+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-
```

The following is sample output from the **show wireless country configured** command:

```
Device# show wireless country configured
 Configured Country..............................: US  - United States
 Configured Country Codes
        US  - United States : 802.11a Indoor,Outdoor/ 802.11b / 802.11g
```

The following is sample output from the **show wireless country supported tx-power** command:

```
Device# show wireless country supported tx-power
      KEY: ##    = Tx Power in dBm.
           ##*   = Channel supports radar detection .
           .     = Channel is not legal in this country.
           (-)   = Regulatory Domains allowed by this country.
           (-,-) = (indoor, outdoor) regulatory Domains allowed by this country.
-----------------:+-+-+-+-+-+-+-+-+-+-+-+-+-+-
     802.11bg    :
     Channels    :                     1 1 1 1 1
                 : 1 2 3 4 5 6 7 8 9 0 1 2 3 4
-----------------:+-+-+-+-+-+-+-+-+-+-+-+-+-+-
 (-CE  ,-CE  ) AE :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-E   ,-E   ) AL :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-A   ,-AR  ) AR :  27 27 27 27 27 27 27 27 27 27 27  .  .  .
 (-E   ,-E   ) AT :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-A   ,-NA  ) AU :  27 27 27 27 27 27 27 27 27 27 27  .  .  .
 (-E   ,-    ) BA :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-E   ,-E   ) BE :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-E   ,-E   ) BG :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-E   ,-    ) BH :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-A   ,-A   ) BO :  27 27 27 27 27 27 27 27 27 27 27  .  .  .
 (-A   ,-AR  ) BR :  27 27 27 27 27 27 27 27 27 27 27  .  .  .
 (-E   ,-    ) BY :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-A   ,-ABN ) CA :  27 27 27 27 27 27 27 27 27 27 27  .  .  .
 (-A   ,-ABN ) CA2 : 27 27 27 27 27 27 27 27 27 27 27  .  .  .
 (-E   ,-E   ) CH :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-AER ,-AR  ) CL :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-E   ,-E   ) CM :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-CE  ,-CE  ) CN :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-A   ,-AR  ) CO :  27 27 27 27 27 27 27 27 27 27 27  .  .  .
 (-A   ,-AB  ) CR :  27 27 27 27 27 27 27 27 27 27 27  .  .  .
 (-E   ,-E   ) CY :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-E   ,-E   ) CZ :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-E   ,-E   ) DE :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-E   ,-E   ) DK :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-A   ,-ABN ) DO :  27 27 27 27 27 27 27 27 27 27 27  .  .  .
 (-E   ,-    ) DZ :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-A   ,-AB  ) EC :  27 27 27 27 27 27 27 27 27 27 27  .  .  .
 (-E   ,-E   ) EE :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-E   ,-E   ) EG :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-E   ,-E   ) ES :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-E   ,-E   ) FI :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-E   ,-E   ) FR :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-E   ,-E   ) GB :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-E   ,-E   ) GI :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-E   ,-E   ) GR :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-A   ,-NA  ) HK :  27 27 27 27 27 27 27 27 27 27 27  .  .  .
 (-E   ,-    ) HR :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-E   ,-E   ) HU :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-E   ,-ER  ) ID :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-E   ,-E   ) IE :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
 (-EI  ,-IE  ) IL :  20 20 20 20 20 20 20 20 20 20 20 20 20  .
```

```
(-I   ,-I  )  ILO :    .   .   .   . 20 20 20 20 20 20 20 20 20   .
(-A   ,-AN )  IN  : 27 27 27 27 27 27 27 27 27 27 27   .   .   .
(-E   ,-E  )  IQ  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  IS  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  IT  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-JPU ,-JPU )  J2  : 23 23 23 23 23 23 23 23 23 23 23 23 23 23
(-JPU ,-JPU )  J3  : 23 23 23 23 23 23 23 23 23 23 23 23 23 23
(-JPQU,-PQ )  J4  : 23 23 23 23 23 23 23 23 23 23 23 23 23 23
(-E   ,-    )  JO  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-JPU ,-JPU )  JP  : 23 23 23 23 23 23 23 23 23 23 23 23 23 23
(-ACE ,-ACEK)  KE  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  KN  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-ACE ,-ACEK)  KR  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  KW  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  KZ  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  LB  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  LI  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,    )  LK  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  LT  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  LU  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  LV  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  MC  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  ME  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  MK  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,    )  MO  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  MT  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-A   ,-NA )  MX  : 27 27 27 27 27 27 27 27 27 27 27   .   .   .
(-ACE ,-AEC )  MY  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  NL  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  NO  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-A   ,-NA )  NZ  : 27 27 27 27 27 27 27 27 27 27 27   .   .   .
(-E   ,-E  )  OM  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-A   ,-AR )  PA  : 27 27 27 27 27 27 27 27 27 27 27   .   .   .
(-A   ,-AR )  PE  : 27 27 27 27 27 27 27 27 27 27 27   .   .   .
(-A   ,-ABN )  PH  : 27 27 27 27 27 27 27 27 27 27 27   .   .   .
(-A   ,-ABN )  PH2 : 27 27 27 27 27 27 27 27 27 27 27   .   .   .
(-E   ,-E  )  PK  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  PL  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-A   ,-A  )  PR  : 27 27 27 27 27 27 27 27 27 27 27   .   .   .
(-E   ,-E  )  PT  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-A   ,-A  )  PY  : 27 27 27 27 27 27 27 27 27 27 27   .   .   .
(-E   ,-E  )  QA  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  RO  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  RS  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-AER ,-ER )  RU  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-AE  ,-AE )  SA  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  SE  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-SE )  SG  : 20 20 20 20 20 20 20 20 20 20 20 20 20 20
(-E   ,-E  )  SI  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  SK  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-ER )  TH  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  TN  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-EI  ,-E  )  TR  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-A   ,-ANT )  TW  : 27 27 27 27 27 27 27 27 27 27 27   .   .   .
(-E   ,-E  )  UA  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-A   ,-AB )  US  : 27 27 27 27 27 27 27 27 27 27 27   .   .   .
(-A   ,-AB )  US2 : 27 27 27 27 27 27 27 27 27 27 27   .   .   .
(-A   ,-AB )  USL : 27 27 27 27 27 27 27 27 27 27 27   .   .   .
(-A   ,-   )  USX : 27 27 27 27 27 27 27 27 27 27 27   .   .   .
(-A   ,-A  )  UY  : 27 27 27 27 27 27 27 27 27 27 27   .   .   .
(-A   ,-AR )  VE  : 27 27 27 27 27 27 27 27 27 27 27   .   .   .
(-E   ,-E  )  VN  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
(-E   ,-E  )  ZA  : 20 20 20 20 20 20 20 20 20 20 20 20 20   .
```

show wireless detail

To display the details of the wireless parameters configured, use the **show wireless detail** command in privileged EXEC mode.

show wireless detail

Syntax Description	This command has no arguments or keywords.
Command Default	No default behavior or values.
Command Modes	Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

The following parameters are displayed:

- The wireless user idle timeout

- The controller configured RF group name

- Fast SSID change

The following is sample output from the **show wireless detail** command:

```
Device# show wireless detail
User Timeout            : 300
RF network              : default
Fast SSID               : Disabled
```

show wireless dhcp relay statistics

To configure the wireless DHCP relay on the AP, use the **show wireless dhcp relay statistic** command.

show wireless dhcp relay statistic

Syntax Description

A.B.C.D	Indicates the target IPv4 address.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 17.3.1	This command was introduced.

Examples

The following example shows how to configure the wireless DHCP relay on the AP:

```
Device# show wireless dhcp relay statistics ip-address 10.1.1.1
```

show wireless dot11h

To see 802.11h configuration details, use the **show wireless dot11h** command.

show wireless dot11h [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	*chassis-number*	Chassis number. Valid range is 1–2.
	active	Active instance.
	standby	Standby instance.
	R0	Route-Processor slot 0.

Command Default	None

Command Modes	Privileged EXEC

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the 802.11h configuration details:

```
Device# show wireless dot11h
```

show wireless dtls connections

To display the Datagram Transport Layer Security (DTLS) server status, use the **show wireless dtls connections** command in privileged EXEC mode.

show wireless dtls connections

Syntax Description   This command has no arguments or keywords.

Command Default   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

The following is sample output from the **show wireless dtls connections** command:

```
Device# show wireless dtls connections
 AP Name         Local Port   Peer IP     Peer Port  Ciphersuite
-------------------------------------------------------------------
   AP-2        Capwap_Ctrl   10.0.0.16     52346      TLS_RSA_WITH_AES_128_CBC_SHA
   AP-3        Capwap_Ctrl   10.0.0.17     52347      TLS_RSA_WITH_AES_128_CBC_SHA
```

show wireless exclusionlist

To see the wireless exclusion list, use the **show wireless exclusionlist** command.

show wireless exclusionlist [**client mac-address** *client-mac-addr* **detail**] [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description		
client-mac-addr	Client MAC address.
chassis-number	Enter the chassis number as either 1 or 2.
active R0	Active instance of the configuration in Route-processor slot 0.
standby R0	Standby instance of the configuration in Route-processor slot 0.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.
Cisco IOS XE Cupertino 17.9.1	The output of the command was modified to include ARP activity information.

Examples

The following example shows how to see the wireless exclusion list:

```
Device# show wireless exclusionlist

Excluded Clients

MAC Address      Description      Exclusion Reason            Time Remaining
-------------------------------------------------------------------------------
10da.4320.cce9                    Client Policy  failure         59
```

The following example shows the exclusion reason for the clients, which has changed from *Client Policy failure* to *Excess ARP activity* from Cisco IOS XE Cupertino 17.9.x onwards:

```
Device# show wireless exclusionlist

MAC Address      Description      Exclusion Reason            Time Remaining
-------------------------------------------------------------------------------
6c96.cff2.889a                    Excess ARP activity            53
```

show wireless exclusionlist client mac-address detail

To see the detailed information for active clients, use the **show wireless exclusionlist client mac-address detail**command.

show wireless exclusionlist client mac-address *client-mac-addr* **detail**

Syntax Description

client-mac-addr	Client MAC address.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.
Cisco IOS XE Cupertino 17.9.1	The output of the command was modified to include ARP activity information.

Examples

The following example shows how to see the detailed information for active clients:

```
Device# show wireless exclusionlist client mac-address 12da.4820.cce9 detail

Client State : Excluded
Client MAC Address : 12da.4820.cce9
Client IPv4 Address: 20.20.20.6
Client IPv6 Address: N/A
Client Username: N/A
Exclusion Reason :  Client Policy  failure
Authentication Method : None
Protocol: 802.11ac
AP MAC Address : 58ac.780e.08f0
AP Name: charlie2
AP slot : 1
Wireless LAN Id : 2
Wireless LAN Name: mhe-ewlc
VLAN Id : 20
```

The following example shows how to see the detailed information for active clients, where ARP rate limit exclusion that has changed from *Client Policy failure* to *Excess ARP activity* from Cisco IOS XE Cupertino 17.9.x onwards is shown:

```
Device# show wireless exclusionlist client mac-address 6c96.cff2.889a detail

Client State : Excluded
Client MAC Address : 6c96.cff2.889a
Client IPv4 Address: N/A
Client IPv6 Address: N/A
Client Username: N/A
Exclusion Reason : Excess ARP activity
```

```
Authentication Method : None
Protocol: 802.11ac
AP MAC Address : 4001.7aca.5680
AP Name: AP40CE.2485.D5E8
AP slot : 1
Wireless LAN Id : N/A
VLAN Id : 63
```

show wireless fabric summary

To view the fabric status, use the **show wireless fabric summary** command.

show wireless fabric summary

Syntax Description

This command has no arguments.

Command Default None

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.
Cisco IOS XE 17.14.1	The output of the command was modified to include IPv6 address.

This example shows how to view fabric status:

```
Device# show wireless fabric summary
Fabric Status      : Enabled


Control-plane:
Name                           IP-address      Key                                     Status
-------------------------------------------------------------------------------------------
test-map                       10.12.13.14     test1                                   Down


Fabric VNID Mapping:
  Name              L2-VNID        L3-VNID        IP Address          Subnet
Control plane name
----------------------------------------------------------------------------------------------------

  test1             12             10             10.6.8.9            255.255.255.236
 test2
```

This example shows how to view fabric status for IPv6:

```
Device# show wireless fabric summary
Fabric Status      : Enabled


Control-plane:
Name                                IP-address                              Key
                           Status
-------------------------------------------------------------------------------------------------
default-control-plane               2001:192:168:1::3                       cisco123
                           Up


Fabric VNID Mapping:
  Name            L2-VNID        L3-VNID         IP Address
  Subnet                                 Control plane name
---------------------------------------------------------------------------------------------------
```

```
130_120_0_INFRA    8188          4097          2003:2000:130:120::1
ffff:ffff:ffff:ffff::                        default-control-plane
```

show wireless fabric client summary

To see the summary of a fabric enabled wireless client, use the **show wireless fabric client summary** command.

show wirelessv fabric client summary

Command Default	None
Command Modes	Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.
Cisco IOS XE 17.14.1	The output of the command was modified to include IPv6 address.

Examples

The following example shows how to see the fabric enabled wireless client summary:

```
Device# show wireless fabric client summary
```

The following example shows how to see the fabric enabled wireless client summary for IPv6:

```
Device# show wireless fabric client summary
Number of Fabric Clients : 2
MAC Address          AP Name              Type    ID     State     Protocol    Method
  L2 VNID      RLOC IP

2c33.7a5b.8fc5    APC4F7.D54D.0B94       WLAN    22     Run       11n(2.4)    None
    8190    1100:10:10:10:1:1:1:6
40ec.995a.434e    APC4F7.D54D.0B94       WLAN    20     Run       11ac        None
    8190    1100:10:10:10:1:1:1:6
```

show wireless fabric vnid mapping

To view all the VNID mapping details, use the **show wireless fabric vnid mapping** command.

show wireless fabric vnid mapping

Syntax Description

This command has no arguments.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view all the VNID mapping details:

```
Device# show wireless fabric vnid mapping
Fabric VNID Mapping:
  Name              L2-VNID        L3-VNID        IP Address             Subnet
Control plane name
-------------------------------------------------------------------------------------------------------

  test1             12             10             10.6.8.9               255.255.255.236
  test2
```

show wireless flow-control

To display the information about flow control on a particular channel, use the **show wireless flow-control** command in privileged EXEC mode.

show wireless flow-control *channel-id*

Syntax Description	*channel-id* Identification number for a channel through which flow control is monitored.

Command Default   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

The following is sample output from the **show wireless flow-control** *channel-id* command:

```
Device# show wireless flow-control 3
Channel Name                    : CAPWAP
FC State                        : Disabled
Remote Server State             : Enabled
Pass-thru Mode                  : Disabled
EnQ Disabled                    : Disabled
Queue Depth                     : 2048
Max Retries                     : 5
Min Retry Gap (mSec)            : 3
```

show wireless flow-control statistics

To display the complete information about flow control on a particular channel, use the **show wireless flow-control statistics** command in privileged EXEC mode.

show wireless flow-control *channel-id* **statistics**

Syntax Description

channel-id	Identification number for a channel through which flow control is monitored.

Command Default   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

The following is sample output from the **show wireless flow-control** *channel-id* **statistics** command:

```
Device# show wireless flow-control 3 statistics
 Channel Name                             : CAPWAP
# of times channel went into FC           : 0
# of times channel came out of FC         : 0
Total msg count received by the FC Infra  : 1
Pass-thru msgs send count                 : 0
Pass-thru msgs fail count                 : 0
# of msgs successfully queued             : 0
# of msgs for which queuing failed        : 0
# of msgs sent thru after queuing         : 0
# of msgs sent w/o queuing                : 1
# of msgs for which send failed           : 0
# of invalid EAGAINS received             : 0
Highest watermark reached                 : 0
# of times Q hit max capacity             : 0
Avg time channel stays in FC (mSec)       : 0
```

show wireless load-balancing

To display the status of the load-balancing feature, use the **show wireless load-balancing** command in privileged EXEC mode.

show wireless load-balancing

Syntax Description This command has no arguments or keywords.

Command Default No default behavior or values.

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

The following is sample output from the **show wireless load-balancing** command:

```
 > show wireless load-balancing
Aggressive Load Balancing............................: per WLAN enabling
Aggressive Load Balancing Window (clients).................:: 5
Aggressive Load Balancing Denial Count.....................:: 3

Statistics
Total Denied Count (clients)................................:: 0
Total Denial Sent (messages)................................:: 0
Exceeded Denial Max Limit Count (times).....................:: 0
None 5G Candidate Count (times).............................:: 0
None 2.4G Candidate Count (times)...........................:: 0
```

show wireless media-stream client detail

To see the media stream clients information by stream name, use the **show wireless media-stream client detail** command.

show wireless media-stream client detail

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see media stream clients information by stream name:

```
Device# show wireless media-stream client detail
```

show wireless media-stream group

To display the wireless media-stream group information, use the **show wireless media-stream group** command.

show wireless media-stream group {**detail** *groupName* | **summary**}

Syntax Description	
detail *groupName*	Display media-stream group configuration details of the group mentioned in the command.
summary	Display media-stream group configuration summary

Command Default   None

Command Modes   User EXEC mode or Privileged EXEC mode

Usage Guidelines   None.

The following is a sample output of the **show wireless media-stream group detail GRP1** command.

```
Device#show wireless media-stream group detail GRP1

Device#show wireless media-stream group detail GRP1
Media Stream Name : GRP1
Start IP Address : 234.1.1.1
End IP Address : 234.1.1.5
RRC Parameters:
Avg Packet Size(Bytes) : 1200
Expected Bandwidth(Kbps) : 1000
Policy : Admitted
RRC re-evaluation : Initial
QoS : video
Status : Multicast-direct
```

The following is a sample output of the **show wireless media-stream group summary** command.

```
Device#show wireless media-stream group summary
Number of Groups:: 1
Stream Name        Start IP                        End IP
Status
-------------------------------------------------------------------------------------------
GRP1               234.1.1.1                       234.1.1.5
Enabled
```

show wireless media-stream message details

To see the wireless multicast-direct session announcement message details, use the **show wireless media-stream message details** command.

show wireless media-stream message details

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the wireless multicast-direct session announcement message details:

```
Device# show wireless media-stream message details
```

show wireless mobility controller ap

To display the list of access points which have joined the sub-domain, use the **wireless mobility controller ap** command.

show wireless mobility controller ap

Syntax Description	**ap**	Show joined Access Point in sub-domain.

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Denali 16.3.1	This command was introduced.

Usage Guidelines None

This example shows how to list the access points which have joined the sub-domain.

```
Device#show wireless mobility controller ap
Number of AP entries in the sub-domain    : 2

AP name                      AP radio MAC     Controller IP     Location
----------------------------------------------------------------------------------------
bos2kk                       00f2.8c42.f520   default-group     default-group
IosAP1                       34ed.522f.7e60   default-group     default-group
```

show wireless media-stream multicast-direct state

To see the state of the wireless multicast-direct configuration, use the **show wireless media-stream multicast-direct state** command.

show wireless media-stream   multicast-direct state

Command Default	None
Command Modes	Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the state of the wireless multicast-direct configuration:

```
Device# show wireless media-stream multicast-direct state
```

show wireless mesh ap

To see the mesh AP related information, use the **show wireless mesh ap** command.

show wireless mesh ap { **summary** | **tree** | **backhaul** } [**chassis** {*chassis-number* | **active** | **standby**}**R0**]

Syntax Description		
summary	Shows the summary of all connected mesh APs.	
tree	Shows the Mesh AP tree.	
backhaul	Shows the mesh APs backhaul info.	
chassis-number	Enter the chassis number as either 1 or 2.	
active R0	Active instance of the configuration in Route-processor slot 0.	
standby R0	Standby instance of the configuration in Route-processor slot 0.	

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the summary of all the connected mesh APs:

```
Device# show wireless mesh ap summary
```

show wireless mesh ap summary

To see the summary of all connected mesh APs, use the **show wireless mesh ap summary** command.

show wireless mesh ap summary [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	**summary**	Shows the summary of all connected mesh APs.

summary	Shows the summary of all connected mesh APs.
chassis-number	Enter the chassis number as either 1 or 2.
active R0	Active instance of the active AP filters in Route-processor slot 0.
standby R0	Standby instance of the active AP filters in Route-processor slot 0.

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the summary of all connected mesh APs:

```
Device# wireless mesh ap summary
```

show wireless mesh ap tree

To see the mesh AP tree, use the **show wireless mesh ap tree** command.

show wireless mesh ap tree

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to view the wireless mesh AP tree:

```
Device # show wireless mesh ap tree
```

show wireless mesh ap tree

To see the mesh AP tree, use the **show wireless mesh ap tree** command.

show wireless mesh ap tree

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

The following example shows how to view the wireless mesh AP tree:

```
Device # show wireless mesh ap tree
```

show wireless mesh cac summary

To view the total number of voice calls and bandwidth utilization of APs in the Mesh network, use the **show wireless mesh cac summary** command.

show wireless mesh cac summary

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Usage Guidelines

Example

This example shows how to display the total number of voice calls and bandwidth utilization of APs in the Mesh network:

```
Device# show wireless mesh cac summary


AP Name                         Slot  Radio      BW Used  Call
------------------------------- ----  ---------  -------  ----
APA023.9FA9.B702                0     802.11b/g  0        0
                                1     802.11a    0        0
APA023.9FA9.D920                0     802.11b/g  1140     2
                                1     802.11a    0        0
AP380E.4DBF.C6A6                0     802.11b/g  0        0
                                1     802.11a    0        0
AP380E.4DBF.C80C                0     802.11b/g  570      0
                                1     802.11a    2144     2
AP380E.4DBF.C816                0     802.11b/g  0        0
                                1     802.11a    0        0
```

show wireless mesh config

To see the mesh configurations, use the **show wireless mesh config** command.

show wireless mesh config [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	**config**	Shows the mesh configurations.
	chassis-number	Enter the chassis number as either 1 or 2.
	active R0	Active instance of the active AP filters in Route-processor slot 0.
	standby R0	Standby instance of the active AP filters in Route-processor slot 0.

Command Default	None

Command Modes	Privileged EXEC

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the mesh configurations:

```
Device# wireless mesh config
```

show wireless mesh rrm dca status

To display the status of the last DCA run per radio, use the **show wireless mesh rrm dca status** command.

show wireless mesh rrm dca status

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

This example shows how to display the status of the last DCA run per radio:

```
Device# show wireless mesh rrm dca status
```

show wireless mesh neighbor

To see the neighbors of all connected mesh APs, use the **show wireless mesh neighbor** command.

show wireless mesh neighbor [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	neighbor	Shows the neighbors of all connected mesh APs.
	chassis-number	Enter the chassis number as either 1 or 2.
	active R0	Active instance of the active AP filters in Route-processor slot 0.
	standby R0	Standby instance of the active AP filters in Route-processor slot 0.

Command Default	None

Command Modes	Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Usage Guidelines   Definition of the field State is as follows:

- **UPDATED**: Adjacency is reachable: communication is symmetric, we can exchange frames with that AP.

- **NEIGH**: Adjacency is parent capable. Local criterion: reachability, strict BGN config, valid cost, potential loops, and so on.

- **CHILD**: Adjacency is actually a child mesh AP (associated to the considered AP).

- **PARENT**: Adjacency is actually the parent mesh AP.

- **DEFAULT**: Adjacency BGN is different than our backhaul configured one.

- **BLOCK**: Adjacency is currently blocklisted due to: auth failures, capwap teardown, and so on.

Examples

The following example shows how to see the neighbors of all connected mesh APs:

```
Device# show wireless mesh neighbor

AP Name/Radio          Channel   Rate     Link-snr   Flags   State
-------------------------------------------------------------------------------------------------


AP Name : Mesh-AP01

54:9f:c6:fa:5c:71      149       auto     0          40
```

```
b0:c5:3c:e5:d9:71        149      auto     22       49       UPDATED NEIGH

e8:eb:34:d5:88:d1        149      auto     0        40

e8:eb:34:d5:8d:d1        149      auto     18       49       UPDATED CHILD

e8:eb:34:d5:94:d1        149      auto     37       4b       UPDATED NEIGH PARENT

e8:eb:34:d5:d3:11        149      auto     31       49       UPDATED NEIGH

e8:eb:34:d5:d8:91        149      auto     0        41       UPDATED

e8:eb:34:d5:da:31        149      auto     18       49       UPDATED NEIGH

e8:eb:34:d5:da:51        149      auto     0        1040     DEFAULT

e8:eb:34:d5:dc:d1        149      auto     9        49       UPDATED NEIGH

e8:eb:34:d5:ef:51        149      auto     0        40

e8:eb:34:d5:f6:51        149      auto     9        49       UPDATED NEIGH

e8:eb:34:d5:fd:51        149      auto     21       49       UPDATED NEIGH

ec:ce:13:9a:89:91        149      auto     19       49       UPDATED NEIGH

ec:ce:13:d7:6f:91        149      auto     18       49       UPDATED NEIGH

ec:ce:13:d7:75:71        149      auto     19       49       UPDATED NEIGH

ec:ce:13:d7:87:91        149      auto     0        41       UPDATED

ec:ce:13:d7:8e:51        149      auto     6        49       UPDATED NEIGH
```

show wireless profile ap priming summary

To view the summary of priming APs, the **show wireless profile ap priming summary** command.

show wireless profile ap priming summary

Syntax Description

The command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1	This command was introduced.

Example

The following example shows how to view the summary of priming APs:

```
Device# show wireless profile ap priming summary
```

show wireless mobility

To view the wireless mobility summary, use the **show wireless mobility** command.

show wireless mobility { **agent** *mobility-agent-ip* **client summary** | **ap-list ip-address** *ip-address* | **controller client summary** | **dtls connections** | **statistics summary** }

Syntax Description		
	agent *mobility-agent-ip* **client summary**	Shows the active clients on a mobility agent.
	ap-list ip-address *ip-address*	Shows the list of Cisco APs known to the mobility group.
	controller client summary	Shows the active clients in the subdomain.
	dtls connections	Shows the DTLS server status.
	statistics	Shows the statistics for the Mobility manager.
	summary	Shows the summary of the mobility manager.

Command Default None

Command Modes Global Configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to display a summary of the mobility manager:

```
Device (config)# show wireless mobility ap-list

AP name                      AP radio MAC     Controller IP    Learnt from
---------------------------------------------------------------------------------------------
TSIM_AP-101                  0000.2000.6600   9.9.9.2          Self
TSIM_AP-102                  0000.2000.6700   9.9.9.2          Self
TSIM_AP-103                  0000.2000.6800   9.9.9.2          Self
TSIM_AP-400                  0000.2001.9100   9.9.9.2          Self
TSIM_AP-402                  0000.2001.9300   9.9.9.2          Self
TSIM_AP-403                  0000.2001.9400   9.9.9.2          Self
TSIM_AP-406                  0000.2001.9700   9.9.9.2          Self
TSIM_AP-407                  0000.2001.9800   9.9.9.2          Self
TSIM_AP-409                  0000.2001.9a00   9.9.9.2          Self
```

show wireless mobility peer ip

To see the details of the mobility peer using its IP address, use the **show wireless mobility peer ip** command.

show wireless mobility peer ip *ip-address*

Syntax Description

ip-address	Mobility peer IPv4 IP address.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the details of the wireless mobility peer using its IP address:

```
Device# show wireless mobility peer ip 209.165.200.224
```

show wireless multicast group summary

To see the wireless multicast group summary, use the **show wireless multicast group summary** command.

show wireless multicast group summary

Command Default	None
Command Modes	Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the summary of the wireless multicast group:

```
Device# show wireless multicast group summary
```

show wireless mobility summary

To see the wireless mobility manager summary, use the **show wireless mobility summary** command.

show wireless mobility summary

Command Default	None
Command Modes	Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the wireless mobility manager's summary:

```
Device# show wireless mobility summary
```

show wireless multicast

To display wireless multicast information, use the **show wireless multicast** command in privileged EXEC mode.

show wireless multicast [**source** *source-ip* **group** *group-ip* **vlan** *vlan-id* | **group** *group-ip* **vlan** *vlan-id*]

<table>
<tr><td>Syntax Description</td><td>source <i>source-ip</i></td><td>(Optional) Specifies the source IPv4 and IPv6 address of multicast traffic.</td></tr>
<tr><td></td><td>group <i>group-ip</i></td><td>(Optional) Specifies the destination group and group IP of mutlicast traffic.</td></tr>
<tr><td></td><td>vlan <i>vlan-id</i></td><td>Displays the client information on VLAN with the specific VLAN ID.</td></tr>
</table>

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines   None

This example shows how to display the wireless multicast information:

```
Device# show wireless multicast

Multicast                              : Enabled
AP Capwap Multicast                    : Unicast
Wireless Broadcast                     : Disabled
Wireless Multicast non-ip-mcast        : Disabled

Vlan        Non-ip-mcast    Broadcast        MGID
-----------------------------------------------------
1           Enabled         Enabled          Enabled
2           Enabled         Enabled          Disabled
94          Enabled         Enabled          Disabled

Device# show wireless multicast
Multicast                              : Disabled
AP Capwap Multicast                    : Unicast
Wireless Broadcast                     : Disabled
Wireless Multicast non-ip-mcast        : Disabled
Wireless Multicast link-local          : Enabled
```

show wireless multicast group

To display the information of the wireless-multicast non-ip VLANs or the group, use the **show wireless multicast group** command in privileged EXEC mode.

show wireless multicast group {**summary** | *group-ip* **vlan** *vlan-id*}

Syntax Description		
	summary	Displays wireless-multicast non-ip group summary.
	group-ip	Specifies the group IP address.
	vlan *vlan-id*	Specifies the destination group IPv4/IPv6 Address of multicast traffic.

Command Default	None.

Command Modes	Privileged EXEC

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines	None.

Examples

This example shows how to display the wireless-multicast non-ip group summary.

```
Device# show wireless multicast group summary
```

show wireless mesh ethernet daisy-chain summary

To verify the ethernet daisy chain summary, use the **show wireless mesh ethernet daisy-chain summary** command.

show wireless mesh ethernet daisy-chain summary

Syntax Description	This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.4.1	This command was introduced.

The following example shows how to verify the ethernet daisy chain summary:

```
Device# show wireless mesh ethernet daisy-chain summary

AP Name BVI MAC        BGN  Backhaul    Ethernet       STP Red
-------------------------------------------------------------------------------------------------
RAP4    683b.78bf.15f0  IOT  Ethernet0   Up Up Dn Dn    Enabled
RAP3    683b.78bf.1634  IOT  Ethernet0   Up Up Dn Dn    Enabled
RAP1    6c8b.d383.b4d4  IOT  Ethernet0   Up Up Dn Dn    Enabled
RAP2    6c8b.d383.b4e8  IOT  Ethernet0   Up Up Up Dn    Enabled
```

show wireless mesh ethernet daisy-chain bgn

To verify the ethernet daisy chain Bridge Group Name (BGN) details, use the **show wireless mesh ethernet daisy-chain bgn** command.

show wireless mesh ethernet daisy-chain bgn *bridge-group-name*

Syntax Description

bridge-group-name	Enter the bridge group name.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.4.1	This command was introduced.

The following example shows how to verify the ethernet daisy chain Bridge Group Name (BGN) details:

```
Device# show wireless mesh ethernet daisy-chain bgn <IOT>

AP Name   BVI MAC         BGN  Backhaul     Ethernet     STP Red
-----------------------------------------------------------------------------------------------------------
RAP4    683b.78bf.15f0  IOT  Ethernet0    Up Up Dn Dn   Enabled
RAP3    683b.78bf.1634  IOT  Ethernet0    Up Up Dn Dn   Enabled
RAP1    6c8b.d383.b4d4  IOT  Ethernet0    Up Up Dn Dn   Enabled
RAP2    6c8b.d383.b4e8  IOT  Ethernet0    Up Up Up Dn   Enabled
```

show wireless performance

To display aggressive load balancing configuration, use the **show wireless performance** command in privileged EXEC mode.

show wireless performance {**ap** | **client**} **summary**

Syntax Description		
ap summary	Displays aggressive load balancing configuration of access points configured to the controller.
client summary	Displays aggressive load balancing configuration details of the clients.

Command Default	No default behavior or values.

Command Modes	Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

The following is sample output from the **show wireless performance ap summary** command.

```
Device# show wireless performance ap summary
Number of APs:
```

The following is sample output from the **show wireless performance client summary** command.

```
Device# show wireless performance client summary
Number of Clients:

MAC Address       AP Name         Status       WLAN/Guest-Lan Auth Protocol Port Wired
-------------------------------------------------------------------------------------------
```

show wireless pmk-cache

To display information about the pairwise master key (PMK) cache, use the **show wireless pmk-cache** command in privileged EXEC mode.

show wireless pmk-cache[**mac-address** *mac-addr*]

Syntax Description

mac-address *mac-addr*	(Optional) Information about a single entry in the PMK cache.

Command Default   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

The following is sample output from the **show wireless pmk-cache mac-address** command:

```
Device# show wireless pmk-cache mac-address H.H.H
Number of PMK caches in total : 0
```

show wireless probe

To display the advanced probe request filtering configuration and the number of probes sent to the WLAN controller per access point per client and the probe interval in milliseconds, use the **show wireless probe** command in privileged EXEC mode.

show wireless probe

Syntax Description   This command has no arguments or keywords.

Command Default   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

The following is sample output from the **show wireless probe** command:

```
Device# show wireless probe
Probe request filtering                     : Enabled
Number of probes per client per radio fwd from AP: 2
Probe request rate-limiting interval        : 500 msec
Aggregate probe request interval            : 500 msec
```

show wireless profile ap priming all

To display the details of priming profiles, use the **show wireless profile ap priming all** command.

show wireless profile ap priming all

Syntax Description   This command has no arguments or keywords.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.2	This command was introduced.

Examples   The following example shows how to display the details of priming profiles:

```
Device# show wireless profile ap priming all

Profile Name  Primary Controller Name  Primary Controller IP  Secondary Controller Name
Secondary Controller IP  Tertiary Controller Name  Tertiary Controller IP  Override
---------------------------------------------------------------------------------------------
AP-PRIMING-1  BGL18-wlc                209.165.201.1          BGL17-wlc
209.165.201.2                                   0.0.0.0                 Disabled
AP-PRIMING-2  BGL18-wlc                209.165.201.2          BGL17-wlc
209.165.201.2           BGL12-wlc                        209.165.201.3           Disabled
```

show wireless profile ap priming all

To display the details of priming profiles, use the **show wireless profile ap priming all** command.

show wireless profile ap priming all

Syntax Description   This command has no arguments or keywords.

Command Default   None

Command Modes   Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.2	This command was introduced.

Examples

The following example shows how to display the details of priming profiles:

```
Device# show wireless profile ap priming all

Profile Name  Primary Controller Name  Primary Controller IP  Secondary Controller Name
Secondary Controller IP  Tertiary Controller Name  Tertiary Controller IP  Override
--------------------------------------------------------------------------------------------------------------------
AP-PRIMING-1  BGL18-wlc                209.165.201.1          BGL17-wlc
209.165.201.2                                   0.0.0.0                 Disabled
AP-PRIMING-2  BGL18-wlc                209.165.201.2          BGL17-wlc
209.165.201.2            BGL12-wlc                     209.165.201.3           Disabled
```

show wireless profile airtime-fairness mapping

To view the ATF policy mapping with the wireless profiles, use the **show wireless profile airtime-fairness mapping** command.

show wireless profile airtime-fairness mapping

Syntax Description

This command has no arguments.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the ATF policy mapping with the wireless profiles:

```
Device# show wireless profile airtime-fairness mapping
Policy Profile                   Band      ATF Policy                          Weight
Client Sharing    Availability
--------------------------------------------------------------------------------------------------
WGB                              2.4GHz                                        -        -
                  No
WGB                              5GHz                                         -        -
                  No
Policy1                          2.4GHz                                       -        -
                  No
Policy1                          5GHz                                         -        -
                  No
Test WBG                         2.4GHz                                       -        -
                  No
Test WBG                         5GHz                                         -        -
                  No
profile-name                     2.4GHz    atf-policy-name                    5
Enabled           Yes
```

show wireless profile airtime-fairness summary

To view the summary of air time fairness profiles, use the **show wireless profile airtime-fairness summary** command.

show wireless profile airtime-fairness summary

Syntax Description	This command has no arguments.

Command Default None

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the summary of air time fairness profiles:

```
Device# show wireless profile airtime-fairness summary
Policy Id        Policy Name                          Weight        Client Sharing
----------------------------------------------------------------------
1                atf-policy-name                        5            Enabled
```

show wireless profile ap packet-capture

To view the AP packet capture information, use the **show wireless profile ap packet-capture** command.

show wireless profile ap packet-capture {**detailed** *profile-name* | **summary**}

Syntax Description

profile-name	AP packet capture profile.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

Example

The following example shows how to view the AP packet capture information:

```
Device# show wireless profile ap packet-capture summary
Number of AP packet capture profiles: 3

Profile Name            Buffer    Duration(M Packet Len FTP IP
------------------------------------------------------------------
test                    1200        20         0       9.1.0.101
test1                   2048        10         0       0.0.0.0
tets1                   1024        10         0       0.0.0.0
```

Example

The following example shows how to view the detailed AP packet capture information of an AP profile:

```
Device# show wireless profile ap packet-capture detailed test1

Profile Name : test1
Description  :
--------------------------------------------------
Buffer Size       : 2048 KB
Capture Duration  : 10 Minutes
Truncate Length   : packet length
FTP Server IP     : 0.0.0.0
FTP path          :
FTP Username      :

Packet Classifiers
  802.11 Control  : Enabled
  802.11 Mgmt     : Enabled
  802.11 Data     : Disabled
  Dot1x           : Disabled
```

```
ARP              : Disabled
IAPP             : Disabled
IP               : Disabled
TCP              : Disabled
TCP port         : all
UDP              : Disabled
UDP port         : all
Broadcast        : Disabled
Multicast        : Disabled
```

show wireless profile calendar-profile detailed

To view the calendar profile details for a specific profile name, use the **show wireless profile calendar-profile detailed** command.

show wireless profile calendar-profile detailed *profile-name*

Syntax Description	*profile-name* Specifies the calendar profile name.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

This example shows how to view the calendar profile details for a specific profile name:

```
Device# show wireless profile calendar-profile detailed daily_calendar_profile
Calendar profiles : daily_calendar_profile
-----------------------------------------------------------------
Recurrence : DAILY
Start Time : 09:00:00
End Time : 17:00:00
```

show wireless profile calendar-profile summary

To view the summary of calendar profiles, use the **show wireless profile calendar-profile summary** command.

show wireless profile calendar-profile summary

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

This example shows the summary of calendar profiles:

```
Device# show wireless profile calendar-profile summary
Number of Calendar Profiles: 3
Profile-Name
--------------------------------
monthly_25_profile
weekly_mon_profile
daily_calendar_profile
```

show wireless profile fabric detailed

To view the details of a given fabric profile name, use the **show wireless profile fabric detailed** command.

show wireless profile fabric detailed *fabric_profile_name*

Syntax Description

This command has no arguments.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the details of a given fabric profile name:

```
Device# show wireless profile fabric detailed test1
Profile-name     : test-fabric
VNID             : 12
SGT              : 5
```

show wireless profile flex

To see the flex parameters of an wireless profile, use the **show wireless profile flex** command.

show wireless profile flex { **detailed** *flex-profile-name* **chassis** {*chassis-number* | **active** | **standby** }**R0** } | **summary chassis** {*chassis-number* | **active** | **standby**}**R0** }

Syntax Description		
	detailed	Shows the flex-profile detailed parameters
	summary	Show the flex-profile summary.
	chassis-number	Chassis number. Valid range is 1–2.
	active	Active instance.
	standby	Standby instance.
	R0	Route-Processor slot 0.

Command Default	None
Command Modes	Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the flex parameter's summary of the wireless profile:

```
Device# show wireless profile flex summary
```

show wireless profile policy all

To display detailed output of all policy profiles, use the **show wireless profile policy all** command.

show wireless profile policy all

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privilege EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.
Cisco IOS XE Amsterdam 17.3.5	The output of the command was modified to include ARP activity information.

Example

This example shows how to view the detailed output of all policy profiles:

```
Device# show wireless profile policy all

Policy Profile Name                 : policy_name
Description                         :
Status                             : ENABLED
.
.
.
!the section of the output that shows whether ARP is enabled or disabled in the policy
profile.
ARP Activity Limit
  Exclusion                         : ENABLED
  PPS                               : 100
  Burst Interval                    : 5
```

show wireless profile policy detailed

To display the wireless policy profile details, use the **show wireless profile policy detailed** command.

show wireless profile policy detailed *policy-profile-name*

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privilege EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Example

This example displays the wireless policy profile details:

```
Device#show wireless profile policy detailed policy-profile-name
```

show wireless profile mesh detailed

To verify the mesh profile, use the **show wireless profile mesh detailed** command.

show wireless profile mesh detailed *profile-name*

Syntax Description

profile-name	Enter the profile name.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.4.1	This command was introduced.

The following example shows how to verify the mesh profile:

```
Device# show wireless profile mesh detailed default-mesh-profile

Mesh Profile Name : default-mesh-profile
-----------------------------------------------
Description : default mesh profile
Bridge Group Name : IOT
Strict match BGN : ENABLED
Amsdu : ENABLED
Background Scan : ENABLED
Channel Change Notification : ENABLED
Backhaul client access : ENABLED
Ethernet Bridging : ENABLED
Ethernet Vlan Transparent : DISABLED
Daisy Chain STP Redundancy : ENABLED
Full Sector DFS : ENABLED
IDS : ENABLED
Multicast Mode : In-Out
Range in feet : 12000
Security Mode : EAP
Convergence Method : Standard
LSC only Authentication : DISABLED
Battery State : ENABLED
Authorization Method : eap_methods
Authentication Method : eap_methods
Backhaul tx rate(802.11bg) : auto
Backhaul tx rate(802.11a) : auto
```

show wireless profile radio summary

To display the wireless radio profile summary, use the **show wireless profile radio summary** command.

show wireless profile radio summary

Syntax Description
This command has no keywords or arguments.

Command Default
None

Command Modes
Privileged EXEC mode

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1	This command was introduced.

Usage Guidelines
None

Example

The following example shows you how to display the wireless radio profile summary:

```
Device# show wireless profile radio summary
```

show wireless profile tunnel summary

To display the wireless tunnel-profile summary, use the **show wireless profile tunnel summary** command.

show wireless profile tunnel summary

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.11.1	This command was introduced.

Example

This example shows how to display the wireless tunnel profile summary:

```
Device# show wireless profile tunnel summary

Profile Name                    AAA-Override AAA-Proxy DHCP Opt82 Enabled
------------------------------- ------------ --------- ---------- --------
eogre_tunnel                             No        No        Yes      Yes
eogre_tunnel_set                         No        No        Yes       No
eogre_tunnel_snmp                        No        No         No       No
```

show wireless redundancy statistics

To see the high availability statistics, use the **show wireless redundancy statistics** command.

show wireless redundancy statistics {**ap-group** | **wncdallchassis** {*chassis-num* | **active** | **standby**}**R0**} {**ap-recovery** | {*instance-id* | **all** | **chassis** {*chassis-num* | **active** | **standby**}**R0**}} {**client-group** | **wncdallchassis** {*chassis-num* | **active** | **standby**}**R0**} {**client-recovery** | {**mobilityd** | **sisf**}**chassis** {*chassis-num* | **active** | **standby**}**R0**} {**wncd** | {*instance-id* | **all** | **chassis** {*chassis-num* | **active** | **standby**}**R0**}}

Syntax Description	*chassis-number*	Enter the chassis number as either 1 or 2.
	active R0	Active instance of the configuration in Route-processor slot 0.
	standby R0	Standby instance of the configuration in Route-processor slot 0.

Command Default	None

Command Modes	Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see all the statistics for WNCD :

show wireless rfid

To display RFID tag information, use the **show wireless rfid** command in privileged EXEC mode.

show wireless rfid {**client** | **detail** *rfid-mac-address* | **stats** | **summary**}

Syntax Description		
	client	Displays the summary of RFID tags that are clients.
	detail	Displays information about a particular RFID tag.
	stats	Displays RFID statistics.
	summary	Displays summary information for all known RFID tags.
	rfid-mac-address	RFID MAC address.

Command Default	None

Command Modes	Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Example

This example shows how to view RFID information:

```
Device# show wireless rfid summary

Total RFID entries: : 16
Total Unique RFID entries : 16
RFID ID VENDOR Closet AP RSSI Time Since Last Heard
0012.b80a.c791 Cisco 7069.5a63.0520 -31 1 minute 40 seconds ago
0012.b80a.c953 Cisco 7069.5a63.0460 -33 2 minutes 15 seconds ago
0012.b80b.806c Cisco 7069.5a63.0260 -45 22 seconds ago
0012.b80d.e9f9 Cisco 7069.5a63.0460 -38 2 minutes 37 seconds ago
0012.b80d.ea03 Cisco 7069.5a63.0520 -43 2 minutes 38 seconds ago
0012.b80d.ea6b Cisco 7069.5a63.0460 -39 2 minutes 35 seconds ago
0012.b80d.ebe8 Cisco 7069.5a63.0520 -43 1 minute 31 seconds ago
0012.b80d.ebeb Cisco 7069.5a63.0520 -43 2 minutes 37 seconds ago
0012.b80d.ec48 Cisco 7069.5a63.0460 -42 2 minutes 16 seconds ago
0012.b80d.ec55 Cisco 7069.5a63.0520 -41 1 second ago
```

show wireless stats ap name

To display the wireless AP BSSID statistics, use the **show wireless stats ap name** *ap-name* **dot11 24ghz slot 0** *wlan-name* *1-4096* **statistics**

show wireless stats ap name *ap-name* **dot11 24ghz slot 0** *wlan-name* *1-4096* **statistics**

Syntax Description

ap-name	Specifies the name of the AP.
wlan-name	Specifies the name of the WLAN.
wlan-id	Specifies the WLAN ID. The value range is 1 to 4096.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Example

This example show how to display the wireless AP BSSID statistics:

```
Device#show wireless stats ap name ap-name dot11 24ghz slot 0 wlan-name  1-4096 statistics
BSSID                 : 7069.5a38.112e
WLAN ID               : 18
Client Count          : 1
TX Statistics
--------------------------------------------------------------------------------
Mgmt          Retries       Data Bytes    Data Retries      Subframe Retries
--------------------------------------------------------------------------------
12            18            16081         18                0
RX Statistics
--------------------------------------------------------------------------------
Mgmt          Data Bytes
--------------------------------------------------------------------------------
74            17693
Data Distribution
--------------------------------------------------------------------------------
Bytes                     RX                      TX
--------------------------------------------------------------------------------
0-64                      55                      93
65-128                    66                      40
129-256                   21                      5
257-512                   10                      3
513-1024                  1                       9
1025-2048                 0                       1
2049-4096                 0                       0
4097-8192                 0                       0
8193-16384                0                       0
16385-32768               0                       0
32769-65536               0                       0
```

```
65537-131072                    0                       0
131073-262144                   0                       0
262145-524288                   0                       0
524289-1048576                  0                       0
WMM Statistics
-------------------------------------------------------------------------------
                                RX                      TX
-------------------------------------------------------------------------------
Voice                           0                       43
Video                           0                       0
Best Effort                     154                     39
Background                      0                       0
MCS
-------------------------------------------------------------------------------
MCS                             RX                      TX
-------------------------------------------------------------------------------
mcs0                            39                      0
mcs1                            2                       0
mcs2                            5                       0
mcs3                            7                       0
mcs4                            25                      0
mcs5                            59                      0
mcs6                            290                     0
mcs7                            1148                    3
mcs8                            2288                    0
mcs9                            4440                    2
```

show wireless stats client delete reasons

To verify total client delete reasons, use the **show wireless stats client delete reasons** command.

show wireless stats client delete reasons

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1	This command was introduced.

This example shows how to verify the total client delete reasons:

```
Device# show wireless stats client delete reasons

Total client delete reasons
--------------------------
Controller deletes
--------------------------
--------------------------
No Operation                                                  : 0
Unknown                                                       : 0
Session Manager                                               : 0
Connection timeout                                            : 0
Datapath plumb                                                : 0
WPA key exchange timeout                                      : 0
802.11w MAX SA queries reached                                : 0
Client deleted during HA recovery                             : 0
Inter instance roam failure                                   : 0
Inter instance roam success                                   : 0
Inter controller roam success                                 : 0
Due to mobility failure                                       : 0
NAS error                                                     : 0
Policy Manager internal error                                 : 0
80211v smart roam failed                                      : 0
DOT11v association failed                                     : 0
DOT11r pre-authentication failure                             : 0
SAE authentication failure                                    : 0
DOT11 failure                                                 : 0
DOT11 SAE invalid message                                     : 0
DOT11 denied data rates                                       : 0
802.11v Client RSSI lower than the association RSSI threshold : 0
invalid QoS parameter                                         : 0
DOT11 IE validation failed                                    : 0
DOT11 group cipher in IE validation failed                    : 0
DOT11 invalid pairwise cipher                                 : 0
DOT11 invalid AKM                                             : 0
DOT11 unsupported RSN version                                 : 0
DOT11 invalid RSNIE capabilities                              : 0
DOT11 received invalid PMKID in the received RSN IE           : 0
```

```
          DOT11 received invalid PMK length                           : 0
          DOT11 invalid MDIE                                          : 0
          DOT11 invalid FT IE                                         : 0
          DOT11 AID allocation conflicts                              : 0
          AVC client re-anchored at the foreign controller            : 0
          Client EAP ID timeout                                       : 0
          Client DOT1x timeout                                        : 0
          Malformed EAP key frame                                     : 0
          EAP key install bit is not expected                         : 0
          EAP key error bit is not expected                           : 0
          EAP key ACK bit is not expected                             : 0
          Invalid key type                                            : 0
          EAP key secure bit is not expected                          : 0
          key description version mismatch                            : 0
          wrong replay counter                                        : 0
          EAP key MIC bit expected                                    : 0
          MIC validation failed                                       : 0
          MAC theft                                                   : 0
          IP theft                                                    : 0
          Policy bind failure                                         : 0
          Web authentication failure                                  : 0
          802.1X authentication credential failure                    : 0
          802.1X authentication timeout                               : 0
          802.11 authentication failure                               : 0
          802.11 association failure                                  : 0
          Manually excluded                                           : 0
          DB error                                                    : 0
          Anchor creation failure                                     : 0
          Anchor invalid Mobility BSSID                               : 0
          Anchor no memory                                            : 0
          Call admission controller at anchor node                    : 0
          Supplicant restart                                          : 0
          Port admin disabled                                         : 0
          Reauthentication failure                                    : 0
          Client connection lost                                      : 0
          Error while PTK computation                                 : 0
          MAC and IP theft                                            : 0
          QoS policy failure                                          : 0
          QoS policy send to AP failure                               : 0
          QoS policy bind on AP failure                               : 0
          QoS policy unbind on AP failure                             : 0
          Static IP anchor discovery failure                          : 0
          VLAN failure                                                : 0
          ACL failure                                                 : 0
          Redirect ACL failure                                        : 0
          Accounting failure                                          : 0
          Security group tag failure                                  : 0
          FQDN filter definition does not exist                       : 0
          Wrong filter type, expected postauth FQDN filter            : 0
          Wrong filter type, expected preauth FQDN filter             : 0
          Invalid group id for FQDN filter valid range  1..16         : 0
          Policy parameter mismatch                                   : 0
          Reauth failure                                              : 0
          Wrong PSK                                                   : 0
          Policy failure                                              : 0
          AAA server unavailable                                      : 0
          AAA server not ready                                        : 0
          No dot1x method configuration                               : 0
          Association connection timeout                               : 0
          MAC-AUTH connection timeout                                 : 0
          L2-AUTH connection timeout                                  : 0
          L3-AUTH connection timeout                                  : 0
          Mobility connection timeout                                 : 0
          static IP connection timeout                                : 0
```

```
              SM session creation timeout                            : 0
              IP-LEARN connection timeout                            : 0
              NACK IFID exists                                       : 0
              Guest-LAN invalid MBSSID                               : 0
              Guest-LAN no memory                                    : 0
              Guest-LAN ceate request failed                         : 0
              EoGRE Reset                                            : 0
              EoGRE Generic Join Failure                             : 0
              EoGRE HA-Reconciliation                                : 0
              Wired idle timeout                                     : 0
              IP Update timeout                                      : 0
              SAE Commit received in Associated State                : 0
              NACK IFID mismatch                                     : 0
              EoGRE Invalid VLAN                                     : 0
              EoGRE Empty Domain                                     : 0
              EoGRE Invalid Domain                                   : 0
              EoGRE Domain Shut                                      : 0
              EoGRE Invalid Gateway                                  : 0
              EoGRE All Gateways down                                : 0
              EoGRE Flex - no active gateway                         : 0
              EoGRE Rule Matching error                              : 0
              EoGRE AAA Override error                               : 0
              EoGRE client onboarding error                          : 0
              EoGRE Mobility Handoff error                           : 0
              L3 VLAN Override connection timeout                    : 0
              Delete received from AP                                : 0
              QoS failure                                            : 0
              WPA group key update timeout                           : 0
              DOT11 unsupported client capabilities                  : 0
              DOT11 association denied unspecified                   : 0
              DOT11 AP have insufficient bandwidth                   : 0
              DOT11 invalid QoS parameter                            : 0
              Client not allowed by assisted roaming                 : 0
              Wired client deleted due to WGB delete                 : 0
              Client Abort                                           : 0
              Mobility peer delete                                   : 0
              No IP                                                  : 0
              BSSID down                                             : 0
              DOT11 QoS policy                                       : 0
              Roam across policy profile deny                        : 0
              4WAY handshake failure - M1 issue                      : 0
              4WAY handshake failure - M3 issue                      : 0
              Exclusion policy template fail                         : 0
              DOT11 Cipher Suite Rejected                            : 0
              WLAN-ID mismatch in access accept failures             : 0
              EasyPSK AAA unknown error                              : 0
              EasyPSK unspecified error                              : 0
              EasyPSK PSK mismatch error                             : 0
              EasyPSK radius busy error                              : 0
              EasyPSK limit reached error                            : 0
              EasyPSK bad 802.1X frame error                         : 0
              EasyPSK missing parameter error                        : 0
              Supplicant name failure                                : 0
              User name failure                                      : 0
              Service set ID failure                                 : 0
              Anchor VLAN ID failure                                 : 0
              PSK failure                                            : 0
              PSK mode failure                                       : 0
              Interim interval failure                               : 0
              Link-local bridging VLAN failure                       : 0
              Link-local bridging VLAN failure                       : 0
              Maximum client limit reached on AP                     : 0
              Maximum client limit reached on AP per wlan            : 0
              Maximum client limit reached on AP radio per wlan      : 0
```

```
Maximum client limit reached on AP radio                          : 0
L3 Access Roam across policy profile deny                         : 0
L3 Access Inter controller roam deny                              : 0
----------------------------
Informational Delete Reason
----------------------------
Mobility WLAN down                                                : 0
AP upgrade                                                        : 0
L3 authentication failure                                         : 0
AP down/disjoin                                                   : 0
MAC authentication failure                                        : 0
Due to SSID change                                                : 0
Due to VLAN change                                                : 0
Admin deauthentication                                            : 0
Session timeout                                                   : 0
Idle timeout                                                      : 0
Supplicant request                                                : 0
Mobility tunnel down                                              : 0
DOT11v timer timeout                                              : 0
DOT11 max STA                                                     : 0
IAPP disassociation for wired client                              : 0
Wired WGB change                                                  : 0
Wired VLAN change                                                 : 0
WGB Wired client joins as a direct wireless client                : 0
Incorrect credentials                                             : 0
Wired client cleanup due to WGB roaming                           : 0
Radio Down                                                        : 0
Mobility failure on fast roam                                     : 0
Due to IP Zone change                                             : 0
Access denied due to Locally Administered MAC Address             : 0
----------------------------
----------------------------
Client initiate delete
----------------------------
Deauthentication or disassociation request                       : 0
Client DHCP                                                       : 0
Client EAP timeout                                                : 0
Client 8021x failure                                              : 0
Client device idle                                                : 0
Client captive portal security failure                           : 0
Client decryption failure                                         : 0
Client interface disabled                                         : 0
Client user triggered disassociation                              : 0
Client miscellaneous reason                                       : 0
Unknown                                                           : 0
Client peer triggered                                             : 0
Client beacon loss                                                : 0
STA triggered PMK timeout                                     : 0
Excess ARP activity                                           : 0
Excess NDP activity                                           : 0
Unspecified QOS failure                                         : 0
Dpath encode failed                                             : 0
VRF-VLAN mismatch failures                                       : 0
----------------------------
AP Deletes
----------------------------
When client is sending disassociation                         : 0
Idle timeout                                                  : 0
Client ACL mismatch                                           : 0
AP authentication stop                                        : 0
Association expired at AP                                      : 0
4-way handshake failed                                        : 0
DHCP timeout                                                  : 0
Reassociation timeout                                         : 0
```

```
SA query timeout                                         : 0
Intra AP roam                                            : 0
Channel switch at AP                                     : 0
Bad AID                                                  : 0
AP requests for client deletion                          : 0
Interface reset                                          : 0
All on slot                                              : 0
Link to client has changed and uplink can be reaper      : 0
Slot disable                                             : 0
MIC failure                                              : 0
VLAN delete                                              : 0
Channel change                                           : 0
Stop reassociation                                       : 0
Packet maximum retry                                     : 0
Transmission deauthentication                            : 0
Sensor station timeout                                   : 0
Age timeout                                              : 0
Transmission threshold fail                              : 0
Uplink receive timeout                                   : 0
Sensor scan next radio                                   : 0
Sensor scan other BSSID                                  : 0
Authentication timeout and web-auth timeout              : 0
Sending deauthentication packet to client                : 0
AP IP learn timeout                                      : 0
Flex group change                                        : 0
EAPOL log off                                            : 0
EAP request timeout                                      : 0
4way handshake failure                                   : 0
MIC validation                                           : 0
Wrong replay counter                                     : 0
AP tunnel down                                           : 0
Inter roam                                               : 0
Unknown client                                           : 0
Reauthentication timeout                                 : 0
Continuous idle timeout                                  : 0
RLDP cleanup                                             : 0
Intra-switch roam                                        : 0
PEM cleanup                                              : 0
RLAN Central switch                                      : 0
RLAN data path add failure                               : 0
RLAN Delete                                              : 0
RLAN Inactive timeout                                    : 0
RLAN MAB failure                                         : 0
CLSM No memory counter                                   : 0
CLSM BSSID mismatch                                      : 0
CLSM No ACL found                                        : 0
CLSM no parent WGB found                                 : 0
CLSM Key plumb faiure                                    : 0
CLSM Mesh key plumb failure                              : 0
CLSM data path add fail                                  : 0
CLSM Authentication response reject                      : 0
CLSM Authentication response send failure                : 0
CLSM Association response send failure                   : 0
CLSM association response failure with status            : 0
CLSM Webauth timer expired                               : 0
CLSM Dot1x timer expired                                 : 0
CLSM deauthentication and disassociation send failure    : 0
Driver event Class3 received                             : 0
Driver event PsPoll when not authenticated               : 0
Driver event ioctl error                                 : 0
Flex FT failure                                          : 0
CLSM driver add failure                                  : 0
Driver client not found                                  : 0
Driver management packet allocation failure              : 0
```

```
Driver invalid cipher                                    : 0
Driver invalid association identifier                    : 0
Driver invalid key                                       : 0
Driver firmware set key failure                          : 0
Driver found invalid HT VHT rates                        : 0
Driver found invalid legacy rates                        : 0
Driver found no overlapping legacy rates                 : 0
Driver found maximum VHT streams                         : 0
Driver found association identifer in use                : 0
Driver found too many association requests               : 0
Driver found cipher attach failure                       : 0
Driver found algorithm mismatch                          : 0
Driver found invalid key length                          : 0
Driver found invalid key index                           : 0
Driver rejected association due to authentication failure : 0
Driver found client addition to internal records failure : 0
Driver found client association entry failure            : 0
Driver found client additions to firmware failure        : 0
Driver related internal failure                          : 0
AP limiting maximum client per AP                        : 0
AP limiting maximum client per AP radio per wlan         : 0
AP limiting maximum client per AP radio                  : 0
-------------------
PC Analytics stats:
---------------------------------------
Report Type          Processed Reports
---------------------------------------
 PC_STA_INFO         : 0
 PC_NEIGH_INFO       : 0
 PC_LOW_RSSI         : 0
 PC_TEMP_DISCONN     : 0
 PC_AP_FAILURE       : 0
 PC_UNKNOWN_AP       : 0
---------------------------------------
Report Type          Dropped Reports
---------------------------------------
 PC_STA_INFO         : 0
 PC_NEIGH_INFO       : 0
 PC_LOW_RSSI         : 0
 PC_TEMP_DISCONN     : 0
 PC_AP_FAILURE       : 0
 PC_UNKNOWN_AP       : 0
```

show wireless statistics mobility

To see the wireless mobility manager statistics, use the **show wireless stats mobility** command.

show wireless stats mobility {**dtls** | **messages**} [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description		
dtls	View the mobility dtls messages statistics.
messages	View the mobility messages statistics.
chassis-number	Enter the chassis number as either 1 or 2.
active	Active instance of the configuration in Route-processor slot 0.
standby	Standby instance of the configuration in Route-processor slot 0.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the statistics of the wireless mobiliy manager:

```
Device# show wireless stats mobility
```

show wireless stats mesh packet error

To see the packet statistics of all connected mesh APs, use the **show wireless stats mesh packet error** command.

show wireless stats mesh packet error [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	

packet	Shows packet statistics information.
error	Shows packet statistics of all connected mesh APs.
active R0	Active instance of the active AP filters in Route-processor slot 0.
standby R0	Standby instance of the active AP filters in Route-processor slot 0.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the packet error statistics of all connected mesh APs:

```
Device# show wireless stats mesh packet error
```

show wireless stats pmk-propagation

To view the PMK propagation statistics on the Cisco wireless controller, use the **show wireless stats pmk-propagation** command in privileged EXEC mode.

show wireless stats pmk-propagation

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.8.1	This command was introduced.

Examples

The following example shows the PMK propagation statistics on the Cisco Wireless controller:

```
Device# show wireless stats pmk-propagation

Site-Tag      Bulk Sync Success    Bulk Sync Failure    Incremental Sync Failure
------------------------------------------------------------------------------
flex-site-tag   97                    0                    0
```

show wireless stats mesh security and queue

To see the mesh queue and security statistics of all connected mesh APs, use the **show wireless stats mesh** command.

show wireless stats mesh {**security** | **queue**} [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

Syntax Description	

queue	Shows queue statistics of all connected mesh APs.
security	Shows security statistics of all connected mesh APs.
chassis-number	Enter the chassis number as either 1 or 2.
active R0	Active instance of the active AP filters in Route-processor slot 0.
standby R0	Standby instance of the active AP filters in Route-processor slot 0.

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the security statistics of all connected mesh APs:

```
Device# show wireless stats mesh security
```

show wireless stats client detail

To verify the statistics about client, use the **show wireless stats client detail** command.

show wireless stats client detail

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1	This command was introduced.

This example shows how to verify the statistics about client:

```
Device# show wireless stats client detail
[…]
Total L3 VLAN Override vlan change received : 1
Total L3 VLAN Override disassociations sent : 1
Total L3 VLAN Override re-associations received : 1
Total L3 VLAN Override successful VLAN change : 1
[…]
L3 VLAN Override connection timeout : 0
```

show wireless stats redundancy config database

To view the high availabilty redundancy configuration statistics, use the **show wireless stats redundancy config database** command.

show wireless stats redundancy config database { **mobility** | **nmspd** | **rrm** | **wncd** | **wncmgrd** } *instance-id* **chassis** { *chassis-num* | **active** | **standby** } **R0**

Syntax Description		
	mobility	Specifes the statistics of Mobilityd configuration database.
	nmspd	Specifes the statistics of NMSPD configuration database.
	rrm	Specifes the statistics of RRM configuration database.
	wncd	Specifes the statistics of WNCD configuration database.
	wncmgrd	Specifes the statistics of WNCD configuration database.
	instance-id	Instance ID. Valid values range from 0 to 7.
	chassis	Specifies the chassis.
	chassis-num	Chassis number.
	active	Specifies the active instance.
	standby	Specifies the standby instance.
	R0	Specifies the route processor slot.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.7.1	This command was introduced.

Examples

The following example shows how to view the high availabilty redundancy configuration statistics:

```
Device# show wireless stats redundancy config database wncd 0 chassis 1 R0

Wncd Configuration Sync Statistics
 Index    Number of Locks    Duration(sec)    Threshold-count    Max-Duration(nsec)
--------------------------------------------------------------------------------
    1         535               127                1              1112156700
```

show wireless summary

To display the number of access points, radios and wireless clients known to the controller, use the **show wireless summary** command in privileged EXEC mode.

show wireless summary

Syntax Description   This command has no arguments or keywords.

Command Default   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

The following is sample output from the **show wireless summary** command:

```
Device# show wireless summary

Access Point Summary

              Total    Up    Down
----------------------------------
802.11a/n         2     2       0
802.11b/g/n       2     2       0
All APs           2     2       0

Client Summary

Current Clients : 1
Excluded Clients: 0
Disabled Clients: 0
```

show wireless urlfilter details

To view the details of a specified wireless URL filter, use the **show wireless urlfilter details** command.

show wireless urlfilter details *list-name*

Syntax Description

This command has no arguments.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the details of a specified wireless URL filter:

```
Device# show wireless urlfilter details urllist_flex_preauth
List Name................. : urllist_flex_preauth
Filter ID............... : : 1
Filter Type.............. : PRE-AUTH
Action................... : PERMIT
Redirect server ipv4...... : 8.8.8.8
Redirect server ipv6...... : 2001:0300:0008:0000:0000:0000:0000:0081
Configured List of URLs
   URL.................... : url1.dns.com
```

show wireless urlfilter summary

To view the summary of all wireless URL filters, use the **show wireless urlfilter summary** command.

show wireless urlfilter summary

Syntax Description

This command has no arguments.

Command Default   None

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

This example shows how to view the summary of all wireless URL filters:

```
Device# show wireless urlfilter summary
Black-list    - DENY
White-list    - PERMIT
Filter-Type   - Specific to Local Mode

URL-List                       ID  Filter-Type  Action   Redirect-ipv4  Redirect-ipv6
-------------------------------------------------------------------------------------------------------
urllist_flex_preauth           1    PRE-AUTH    PERMIT    8.8.8.8
2001:0300:0008:0000:0000:0000:0000:0081
```

show wireless vlan details

To see the VLAN details, use the **show wireless vlan details** command.

show wireless vlan details [**chassis** {*chassis-number* | **active** | **standby**} **R0**]

| **Command Default** | None |

| **Command Modes** | Privileged EXEC |

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the VLAN details:

```
Device# show wireless vlan details chassis active r0
```

show wireless wgb mac-address

To view all the clients of the wireless workgroup bridge (WGB) using its MAC address, use the **show wireless wgb mac-address** command.

show wireless wgb mac-address *mac-address* **detail**

Syntax Description	*mac-address* MAC address of the WGB.
	detail View clients of the wireless WGB.

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the clients of the wireless WGB:

```
Device# show wireless wgb mac-address 98-C7-7B-09-EF-ED detail
```

show wireless wgb summary

To see the active workgroup bridges (WGB), use the **show wireless wgb summary** command.

show wireless wgb summary

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the active workgroup bridges (WGB):

```
Device# show wireless wgb summary
```

show wireless wps mfp ap summary

To verify, if access points support Management Frame Protection (MFP) validation and protection, use the **show wireless wps mfp ap summary** command.

show wireless wps mfp ap summary

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

This example shows the access points that support MFP validation and protection:

```
Device# show wireless wps mfp ap summary
AP Name                      Radio MAC              Validation            Protection
-------------------------------------------------------------------------------------
AP002A.1087.CBF4             00a2.eefd.bdc0         Enabled               Enabled
AP58AC.78DE.9946             00a2.eeb8.4ae0         Enabled               Enabled
APb4de.3196.caac             4c77.6d83.6b90         Enabled               Enabled
```

show wireless wps mfp statistics

To view the Management Frame Protection (MFP) statistics, use the **show wireless wps mfp statistics** command.

show wireless wps mfp statistics

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

This example shows the Management Frame Protection (MFP) statistics:

```
Device# show wireless wps mfp statistics
BSSID           Radio DetectorAP                          LastSourceAddr Error         Count
     FrameTypes

aabb.ccdd.eeff a    AP3800                                aabb.ccdd.eeff Invalid MIC   10
     Beacon, Probe Response

                                                                         Invalid MIC   20
     Beacon, Probe Response
```

show wireless wps mfp summary

To view the detailed information of Management Frame Protection (MFP), use the **show wireless wps mfp summary** command.

show wireless wps mfp summary

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.

This example shows the detailed information of Management Frame Protection (MFP):

```
Device# show wireless wps mfp summary
Management Frame Protection
  Global Infrastructure MFP state : Enabled
  AP Impersonation detection      : Disabled
  Key refresh interval            : 15
```

show wireless wps rogue

To see the Rogue AP and Client information, use the **show wireless wps rogue** command.

See Adhoc Rogues (IBSS) information
show wireless wps rogue {**adhoc** | {**detailed** *mac-addr*} | **summary**}

See rogue AP information
show wireless wps rogue ap {**clients** *mac-addr* | **custom summary** | **detailed** *mac-addr* | **friendly summary** | **list mac-address** *mac-addr* | **malicious summary** | **summary** | **unclassified summary** | **rldp** {**summary** | **in-progress** | **detailed** *rogue-ap-mac-addr*}}

See rogue auto-containment information
show wireless wps rogue auto-contain

See rogue client information
show wireless wps rogue client {**summary** | **detailed** *mac-addr*}

See rogue ignore list
show wireless wps rogue ignore-list

See classification rule information
show wireless wps rogue rule {**detailed** *rule-name* | **summary**}

See statistics about rogue feature
show wireless wps rogue stats [**internal**]

Syntax Description	*mac-address*	MAC address of the client.

Command Default	None

Command Modes	Privileged EXEC

Command History	**Release**	**Modification**
	Cisco IOS XE Gibraltar 16.10.1	This command was introduced in a release earlier than Cisco IOS XE Gibraltar 16.10.1.

Examples

The following example shows how to see the rogue feature statistics:

```
Device# show wireless wps rogue stats
```

show wireless wps rogue ap summary

To display a list of all rogue access points detected by the device, use the **show wireless wps rogue ap summary** command.

show wireless wps rogue ap summary

Command Default   None.

Command Modes   Privileged EXEC

Command History

Release	Modification
	This command was introduced.

Usage Guidelines   None.

This example shows how to display a list of all rogue access points detected by the device:

```
Device# show wireless wps rogue ap summary
Rogue Location Discovery Protocol         : Disabled
Rogue on wire Auto-Contain                : Disabled
Rogue using our SSID Auto-Contain         : Disabled
Valid client on rogue AP Auto-Contain     : Disabled
Rogue AP timeout                          : 1200
Rogue Detection Report Interval           : 10
Rogue AP minimum RSSI                     : -128
Rogue AP minimum transient time           : 0

Number of rogue APs detected : 624

MAC Address        Classification    # APs    # Clients   Last Heard
-------------------------------------------------------------------------------
0018.e78d.250a     Unclassified      1        0           Thu Jul 25 05:04:01 2013
0019.0705.d5bc     Unclassified      1        0           Thu Jul 25 05:16:26 2013
0019.0705.d5bd     Unclassified      1        0           Thu Jul 25 05:10:28 2013
0019.0705.d5bf     Unclassified      1        0           Thu Jul 25 05:16:26 2013
```

show wireless wps rogue client detailed

To view the detailed information of a specific rogue client, use the **show wireless wps rogue client detailed** *client-mac* command.

show wireless wps rogue client detailed *client-mac*

Syntax Description

client-mac	MAC address of the rogue client.

Command Default

None.

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

None.

This example shows how to display the detailed information for a specific rogue client:

```
Device# show wireless wps rogue client detail  0024.d7f1.2558
Rogue BSSID                     : 64d8.146f.379f
Rogue Radio Type                : 802.11n - 5GHz
State                           : Alert
First Time Rogue was Reported   : Wed Aug  7 12:51:43 2013
Last Time Rogue was Reported    : Wed Aug  7 12:51:43 2013
Reported by
  AP 2
    MAC Address                 : 3cce.7309.0370
    Name                        : AP3502-talwar-ccie
    Radio Type                  : 802.11a
    RSSI                        : -42 dBm
    SNR                         : 47 dB
    Channel                     : 52
    Last reported by this AP    : Wed Aug  7 12:51:43 2013
```

show wireless wps rogue ap detailed

To view the detailed information of a rogue access point, use **show wireless wps rogue ap detailed** *mac-address* command.

show wireless wps rogue ap detailed *0008.30a7.7797*

Syntax Description	*mac-address*	The MAC address of the rogue access point.
	Note	If a rogue access point uses dot11n on 2.4GHz, the command output displays the **radio type** as **dot11g , dot11n - 2.4 GHz**.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Fuji 16.7.x	This command was introduced.

Example

This example shows how to display the detailed information about a rogue access point:

```
Device# wireless wps rogue ap detailed 0008.30a7.7797
Rogue Event history

Rogue BSSID                        : 0008.30a7.7797
Is Rogue on Wired Network          : No
Classification                     : Unclassified
Manually Contained                 : Yes
State                              : Contained Pending
Containment Level                  : 1
Number of Containing APs           : 0
First Time Rogue was Reported      : 03/08/2017 17:41:55
Last Time Rogue was Reported       : 03/08/2017 21:48:34

Number of clients                  : 0

Reported By
  AP Name : JEWLC-AA
    MAC Address                    : 00d7.8f4e.7240
    Detecting slot ID              : 0
    Radio Type                     : dot11g , dot11n - 2.4 GHz
    SSID                           : psk
    Channel                        : 5
    Channel Width                  : 20 MHz
    RSSI                           : -128 dBm
    SNR                            : 0 dB
    Encryption                     : Enabled
    ShortPreamble                  : Disabled
    WPA Support                    : Not Friendly
    Last reported by this AP       : 03/08/2017 21:48:34
```

show wireless wps rogue client summary

To display summary of WPS rogue clients, use the **show wireless wps rogue client summary** command.

show wireless wps rogue client summary

Command Default None

Command Modes Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1	This command was introduced.

Usage Guidelines

Example

The following displays the output of the **show wireless wps rogue client summary** command:

```
Device# show wireless wps rogue client summary
Validate rogue clients against AAA  : Disabled
Validate rogue clients against MSE  : Enabled
Number of rogue clients detected : 0
```

show wireless wps summary

To view the detailed information of wps, use the **show wireless wps summary** command.

show wireless wps summary

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1	This command was introduced.
Cisco IOS XE Amsterdam 17.3.5	The output of the command was modified to include ARP activity information.

This example shows if the Management Frame Protection (MFP) is enabled or disabled:

```
Device# show wireless wps summary

Client Exclusion Policy
  Excessive 802.11-association failures   : unknown
  Excessive 802.11-authentication failures: unknown
  Excessive 802.1x-authentication         : unknown
  IP-theft                                : unknown
  Excessive Web authentication failure    : unknown
  Failed Qos Policy                       : unknown

Management Frame Protection
  Global Infrastructure MFP state : Enabled
  AP Impersonation detection      : Disabled
  Key refresh interval            : 15
```

This example shows whether rate limiting is enabled for ARP packets:

```
Device# show wireless wps summary

Client Exclusion Policy
  Excessive 802.11-association failures   : Enabled
  Excessive 802.1x-authentication         : Enabled
  Mac and IP-theft                        : Enabled
  Excessive Web authentication failure    : Enabled
  Failed Qos Policy                       : Enabled
  Excessive ARP Activity                  : Enabled (per policy setting)
```

show wlan name client stats

To view the WLAN client statistics, use the **show wlan name client stats** command.

show wlan name *wlan-name* **client stats**

Syntax Description	*wlan-name* WLAN name.

Command Default   None

Command Modes   Privileged EXEC(#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced.

This example shows how to view the WLAN client statistics:

```
Device# show wlan name wlan1 client stats

Wlan Profile Name: wlan1, Wlan Id: 3
Current client state statistics:
-----------------------------------------------------------------------
  Authenticating         : 0
  Mobility               : 0
  IP Learn               : 0
  Webauth Pending        : 0
  Run                    : 0

Locally Administered MAC Clients  : 0
L3 Access Clients                 : 0

.
.
.
```

show wlan summary sort ascending client-count

To view the WLAN summary sorted ascendingly based on the client count, use the **show wlan summary sort ascending client-count** command.

show wlan summary sort ascending client-count

Syntax Description	This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced.

This example shows how to view the WLAN summary sorted ascendingly based on the client count:

```
Device# show wlan summary sort ascending client-count
--------------------------------------------------------------------------------
Wlan-name                       ID          Client count        Data Usage
--------------------------------------------------------------------------------
rlan_test_1                     1           1                   6277
WLAN_CA_WPA2_AES_DOT1X          70          1                   167781
```

show wlan summary sort descending client-count

To view the WLAN summary sorted descendingly based on the client count, use the **show wlan summary sort descending client-count** command.

show wlan summary sort descending client-count

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced.

This example shows how to view the WLAN summary sorted descendingly based on the client count:

```
Device# show wlan summary sort descending client-count
--------------------------------------------------------------------------------
Wlan-name                      ID          Client count        Data Usage
--------------------------------------------------------------------------------
rlan_test_1                    1           1                   6277
WLAN_CA_WPA2_AES_DOT1X         70          1                   167781
```

show wlan summary sort ascending data-usage

To view the wlan summary sorted ascendingly based on the data usage, use the **show wlan summary sort ascending data-usage** command.

show wlan summary sort ascending data-usage

Syntax Description   This command has no keywords or arguments.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Gibraltar 17.1.1	This command was introduced.

This example shows how to view the wlan summary sorted ascendingly based on the data usage:

```
Device# show wlan summary sort ascending data-usage
--------------------------------------------------------------------------------
Wlan-name                       ID           Client count          Data Usage
--------------------------------------------------------------------------------
rlan_test_1                     1            1                     6277
WLAN_CA_WPA2_AES_DOT1X          70           1                     167781
```

show wlan summary sort descending data-usage

To view the WLAN summary sorted descendingly based on the data usage, use the **show wlan summary sort descending data-usage** command.

show wlan summary sort descending data-usage

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1s	This command was introduced.

This example shows how to view the WLAN summary sorted descendingly based on the data usage:

```
Device# show wlan summary sort descending data-usage
-------------------------------------------------------------------------------------
Wlan-name                     ID          Client count          Data Usage
-------------------------------------------------------------------------------------
WLAN_CA_WPA2_AES_DOT1X        70          1                     167781
rlan_test_1                   1           1                     6277
```

show wps summary

To display Wireless Protection System (WPS) summary information, use the **show wps summary** command.

show wps summary

Syntax Description	This command has no arguments or keywords.
Command Default	None

The following example shows how to display WPS summary information:

```
(Cisco Controller) > show wps summary
Auto-Immune
  Auto-Immune.................................... Disabled
Client Exclusion Policy
  Excessive 802.11-association failures.......... Enabled
  Excessive 802.11-authentication failures....... Enabled
  Excessive 802.1x-authentication................ Enabled
  IP-theft....................................... Enabled
  Excessive Web authentication failure........... Enabled
Trusted AP Policy
  Management Frame Protection.................... Disabled
  Mis-configured AP Action....................... Alarm Only
    Enforced encryption policy................... none
    Enforced preamble policy..................... none
    Enforced radio type policy................... none
    Validate SSID................................ Disabled
  Alert if Trusted AP is missing................. Disabled
  Trusted AP timeout............................. 120
Untrusted AP Policy
  Rogue Location Discovery Protocol.............. Disabled
    RLDP Action.................................. Alarm Only
  Rogue APs
    Rogues AP advertising my SSID................ Alarm Only
    Detect and report Ad-Hoc Networks............ Enabled
  Rogue Clients
    Validate rogue clients against AAA........... Enabled
    Detect trusted clients on rogue APs.......... Alarm Only
  Rogue AP timeout............................... 1300
Signature Policy
  Signature Processing........................... Enabled
...
```

shutdown

To close the RF Profile and disable the network, use the **shutdown** command. To disable shutdown execution, use the **no** form of this command.

shutdown

Syntax Description	**shutdown**	Shuts down the profile and disables network.

Command Default   None

Command Modes   config-rf-profile

Command History	**Release**	**Modification**
	Cisco IOS XE Denali 16.3.1	This command was introduced.

Usage Guidelines   None

This example shows how to close a RF Profile and disable the network.

```
Device(config-rf-profile)#shutdown
```

shutdown

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