Flexible NetFlow Command Reference, Cisco IOS XE Release 3.6E (Catalyst 3650 Switches)

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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.

Convention	Description
{x | y}	Required alternative keywords are grouped in braces and separated by vertical bars.
[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

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071

SAVE THESE INSTRUCTIONS

Related Documentation

Note Before installing or upgrading the switch, refer to the switch release notes.

- Cisco Catalyst 3650 Switch documentation, located at:

  http://www.cisco.com/go/cat3650_docs

- Cisco SFP and SFP+ modules documentation, including compatibility matrixes, located at:

  http://www.cisco.com/en/US/products/hw/modules/ps5455/tsd_products_support_series_home.html

- Error Message Decoder, located at:

  https://www.cisco.com/cgi-bin/Support/Errordecoder/index.cgi

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/c/en/us/td/docs/general/whatsnew/whatsnew.html

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Using the Command-Line Interface

This chapter contains the following topics:

Information About Using the Command-Line Interface

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, a 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 switch 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 switch 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.	`Switch>`	Enter **logout** or **quit**.	Use this mode to • Change terminal settings. • Perform basic tests. • Display system information.
Privileged EXEC	While in user EXEC mode, enter the **enable** command.	`Switch#`	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.	`Switch(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 switch.
VLAN configuration	While in global configuration mode, enter the **vlan** *vlan-id* command.	`Switch(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 switch startup configuration file.
Interface configuration	While in global configuration mode, enter the **interface** command (with a specific interface).	`Switch(config-if)#`		Use this mode to configure parameters for the Ethernet ports.

Mode	Access Method	Prompt	Exit Method	About This Mode
			To exit to global configuration mode, enter **exit**. To return to privileged EXEC mode, press **Ctrl-Z** or enter **end**.	
Line configuration	While in global configuration mode, specify a line with the **line vty** or **line console** command.	`Switch(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 switch to recognize the command as unique.

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

```
Switch# 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 switch.

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 switch 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 switch 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:** `Switch# help`	Obtains a brief description of the help system in any command mode.

Step 2	*abbreviated-command-entry* **?**
	
	Example:
	`Switch# di?`
	`dir disable disconnect`
		Obtains a list of commands that begin with a particular character string.

Step 3	*abbreviated-command-entry* <Tab>
	
	Example:
	`Switch# sh conf<tab>`
	`Switch# show configuration`
		Completes a partial command name.

Step 4	**?** **Example:** `Switch> ?`	Lists all commands available for a particular command mode.
Step 5	*command* **?** **Example:** `Switch> show ?`	Lists the associated keywords for a command.

Step 6	*command keyword* **?**
	
	Example:
	`Switch(config)# cdp holdtime ?`
	` <10-255> Length of time (in sec) that receiver`
	` must keep this packet`
		Lists the associated arguments for a keyword.

How to Use the CLI to Configure Features

Configuring the Command History

The software provides a history or record of commands that you have entered. The command history feature is particularly useful for recalling long or complex commands or entries, including access lists. You can customize this feature to suit your needs.

Changing the Command History Buffer Size

By default, the switch records ten command lines in its history buffer. You can alter this number for a current terminal session or for all sessions on a particular line. This procedure is optional.

SUMMARY STEPS

1. **terminal history** [**size** *number-of-lines*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**terminal history** [**size** *number-of-lines*] **Example:** `Switch# terminal history size 200`	Changes the number of command lines that the switch records during the current terminal session in privileged EXEC mode. You can configure the size from 0 to 256.

Recalling Commands

To recall commands from the history buffer, perform one of the actions listed in this table. These actions are optional.

Note The arrow keys function only on ANSI-compatible terminals such as VT100s.

SUMMARY STEPS

1. **Ctrl-P** or use the **up arrow** key
2. **Ctrl-N** or use the **down arrow** key
3. **show history**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**Ctrl-P** or use the **up arrow** key	Recalls commands in the history buffer, beginning with the most recent command. Repeat the key sequence to recall successively older commands.
Step 2	**Ctrl-N** or use the **down arrow** key	Returns to more recent commands in the history buffer after recalling commands with **Ctrl-P** or the up arrow key. Repeat the key sequence to recall successively more recent commands.
Step 3	**show history** **Example:** Switch# **show history**	Lists the last several commands that you just entered in privileged EXEC mode. The number of commands that appear is controlled by the setting of the **terminal history** global configuration command and the **history** line configuration command.

Disabling the Command History Feature

The command history feature is automatically enabled. You can disable it for the current terminal session or for the command line. This procedure is optional.

SUMMARY STEPS

1. **terminal no history**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**terminal no history** **Example:** Switch# **terminal no history**	Disables the feature during the current terminal session in privileged EXEC mode.

Enabling and Disabling Editing Features

Although enhanced editing mode is automatically enabled, you can disable it and reenable it.

SUMMARY STEPS

1. **terminal editing**
2. **terminal no editing**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**terminal editing** **Example:** `Switch# `**`terminal editing`**	Reenables the enhanced editing mode for the current terminal session in privileged EXEC mode.
Step 2	**terminal no editing** **Example:** `Switch# `**`terminal no editing`**	Disables the enhanced editing mode for the current terminal session in privileged EXEC mode.

Editing Commands Through Keystrokes

The keystrokes help you to edit the command lines. These keystrokes are optional.

Note　The arrow keys function only on ANSI-compatible terminals such as VT100s.

Table 3: Editing Commands

Editing Commands	Description
Ctrl-B or use the **left arrow** key	Moves the cursor back one character.
Ctrl-F or use the **right arrow** key	Moves the cursor forward one character.
Ctrl-A	Moves the cursor to the beginning of the command line.
Ctrl-E	Moves the cursor to the end of the command line.
Esc B	Moves the cursor back one word.
Esc F	Moves the cursor forward one word.
Ctrl-T	Transposes the character to the left of the cursor with the character located at the cursor.
Delete or **Backspace** key	Erases the character to the left of the cursor.
Ctrl-D	Deletes the character at the cursor.
Ctrl-K	Deletes all characters from the cursor to the end of the command line.
Ctrl-U or **Ctrl-X**	Deletes all characters from the cursor to the beginning of the command line.
Ctrl-W	Deletes the word to the left of the cursor.
Esc D	Deletes from the cursor to the end of the word.
Esc C	Capitalizes at the cursor.
Esc L	Changes the word at the cursor to lowercase.
Esc U	Capitalizes letters from the cursor to the end of the word.

Ctrl-V or Esc Q	Designates a particular keystroke as an executable command, perhaps as a shortcut.
Return key	Scrolls down a line or screen on displays that are longer than the terminal screen can display.
	Note　The More prompt is used for any output that has more lines than can be displayed on the terminal screen, including **show** command output. You can use the **Return** and **Space** bar keystrokes whenever you see the More prompt.
Space bar	Scrolls down one screen.
Ctrl-L or **Ctrl-R**	Redisplays the current command line if the switch suddenly sends a message to your screen.

Editing Command Lines That Wrap

You can use a wraparound feature for commands that extend beyond a single line on the screen. When the cursor reaches the right margin, the command line shifts ten spaces to the left. You cannot see the first ten characters of the line, but you can scroll back and check the syntax at the beginning of the command. The keystroke actions are optional.

To scroll back to the beginning of the command entry, press **Ctrl-B** or the left arrow key repeatedly. You can also press **Ctrl-A** to immediately move to the beginning of the line.

Note　The arrow keys function only on ANSI-compatible terminals such as VT100s.

The following example shows how to wrap a command line that extends beyond a single line on the screen.

SUMMARY STEPS

1. **access-list**
2. **Ctrl-A**
3. **Return** key

DETAILED STEPS

	Command or Action	Purpose
Step 1	**access-list**	Displays the global configuration command entry that extends beyond one line.
	Example:	When the cursor first reaches the end of the line, the line is shifted ten spaces to the left and redisplayed. The dollar sign ($) shows that the
	`Switch(config)# access-list 101 permit tcp`	

	Command or Action	Purpose

	`  10.15.22.25 255.255.255.0 10.15.22.35`
	`Switch(config)# $ 101 permit tcp`
	`10.15.22.25 255.255.255.0 10.15.22.35`
	`255.25`
	`Switch(config)# $t tcp 10.15.22.25`
	`255.255.255.0 131.108.1.20 255.255.255.0`
	`eq`
	`Switch(config)# $15.22.25 255.255.255.0`
	`10.15.22.35 255.255.255.0 eq 45`
		line has been scrolled to the left. Each time the cursor reaches the end of the line, the line is again shifted ten spaces to the left.

Step 2	**Ctrl-A**
	
	Example:
	`Switch(config)# access-list 101 permit tcp`
	` 10.15.22.25 255.255.255.0 10.15.2$`
		Checks the complete syntax.
		
		The dollar sign ($) appears at the end of the line to show that the line has been scrolled to the right.

Step 3	**Return** key	Execute the commands. The software assumes that you have a terminal screen that is 80 columns wide. If you have a different width, use the **terminal width** privileged EXEC command to set the width of your terminal. Use line wrapping with the command history feature to recall and modify previous complex command entries.

Searching and Filtering Output of show and more Commands

You can search and filter the output for **show** and **more** commands. This is useful when you need to sort through large amounts of output or if you want to exclude output that you do not need to see. Using these commands is optional.

SUMMARY STEPS

1. {**show** | **more**} *command* | {**begin** | **include** | **exclude**} *regular-expression*

DETAILED STEPS

	Command or Action	Purpose
Step 1	{**show**	**more**} *command*	{**begin**	**include**	**exclude**} *regular-expression* **Example:** `Switch# show interfaces	include protocol` `Vlan1 is up, line protocol is up` `Vlan10 is up, line protocol is down` `GigabitEthernet1/0/1 is up, line protocol is down` `GigabitEthernet1/0/2 is up, line protocol is up`	Searches and filters the output. Expressions are case sensitive. For example, if you enter **| exclude output**, the lines that contain **output** are not displayed, but the lines that contain **output** appear.

Accessing the CLI on a Switch Stack

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

You manage the switch stack and the stack member interfaces through the active switch. You cannot manage stack members on an individual switch basis. You can connect to the active switch through the console port or the Ethernet management port of one or more stack members. Be careful with using multiple CLI sessions on the active switch. Commands that you enter in one session are not displayed in the other sessions. Therefore, it is possible to lose track of the session from which you entered commands.

Note   We recommend using one CLI session when managing the switch stack.

If you want to configure a specific stack member port, you must include the stack member number in the CLI command interface notation.

To debug the standby switch, use the **session standby ios** privileged EXEC command from the active switch to access the IOS console of the standby switch. To debug a specific stack member, use the **session switch** *stack-member-number* privileged EXEC command from the active switch to access the diagnostic shell of the stack member. For more information about these commands, see the switch command reference.

Accessing the CLI Through a Console Connection or Through Telnet

Before you can access the CLI, you must connect a terminal or a PC to the switch console or connect a PC to the Ethernet management port and then power on the switch, as described in the hardware installation guide that shipped with your switch.

If your switch is already configured, you can access the CLI through a local console connection or through a remote Telnet session, but your switch must first be configured for this type of access.

You can use one of these methods to establish a connection with the switch:

- Connect the switch console port to a management station or dial-up modem, or connect the Ethernet management port to a PC. For information about connecting to the console or Ethernet management port, see the switch hardware installation guide.

- Use any Telnet TCP/IP or encrypted Secure Shell (SSH) package from a remote management station. The switch must have network connectivity with the Telnet or SSH client, and the switch must have an enable secret password configured.

    - The switch supports up to 16 simultaneous Telnet sessions. Changes made by one Telnet user are reflected in all other Telnet sessions.

    - The switch supports up to five simultaneous secure SSH sessions.

After you connect through the console port, through the Ethernet management port, through a Telnet session or through an SSH session, the user EXEC prompt appears on the management station.

Flexible NetFlow Commands

cache

To configure a flow cache parameter for a flow monitor, use the **cache** command in flow monitor configuration mode. To remove a flow cache parameter for a flow monitor, use the **no** form of this command.

cache {**timeout** {**active**| **inactive**} *seconds*| **type normal**}

no cache {**timeout** {**active**| **inactive**} | **type**}

Syntax Description

timeout	Specifies the flow timeout.
active	Specifies the active flow timeout.
inactive	Specifies the inactive flow timeout.
seconds	The timeout value in seconds. The range is 1 to 604800 (7 days).
type	Specifies the type of the flow cache.
normal	Configures a normal cache type. The entries in the flow cache will be aged out according to the **timeout active** *seconds* and **timeout inactive** *seconds* settings. This is the default cache type.

Command Default

The default flow monitor flow cache parameters are used.

The following flow cache parameters for a flow monitor are enabled:

- Cache type: normal

- Active flow timeout: 1800 seconds

- Inactive flow timeout: 15 seconds

Command Modes

Flow monitor configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines

Each flow monitor has a cache that it uses to store all the flows it monitors. Each cache has various configurable elements, such as the time that a flow is allowed to remain in it. When a flow times out, it is removed from the cache and sent to any exporters that are configured for the corresponding flow monitor.

The **cache timeout active** command controls the aging behavior of the normal type of cache. If a flow has been active for a long time, it is usually desirable to age it out (starting a new flow for any subsequent packets in the flow). This age out process allows the monitoring application that is receiving the exports to remain up to date. By default, this timeout is 1800 seconds (30 minutes), but it can be adjusted according to system requirements. A larger value ensures that long-lived flows are accounted for in a single flow record; a smaller value results in a shorter delay between starting a new long-lived flow and exporting some data for it. When you change the active flow timeout, the new timeout value takes effect immediately.

The **cache timeout inactive** command also controls the aging behavior of the normal type of cache. If a flow has not seen any activity for a specified amount of time, that flow will be aged out. By default, this timeout is 15 seconds, but this value can be adjusted depending on the type of traffic expected. If a large number of short-lived flows is consuming many cache entries, reducing the inactive timeout can reduce this overhead. If a large number of flows frequently get aged out before they have finished collecting their data, increasing this timeout can result in better flow correlation. When you change the inactive flow timeout, the new timeout value takes effect immediately.

The **cache type normal** command specifies the normal cache type. This is the default cache type. The entries in the cache will be aged out according to the **timeout active** *seconds* and **timeout inactive** *seconds* settings. When a cache entry is aged out, it is removed from the cache and exported via any exporters configured for the monitor associated with the cache.

To return a cache to its default settings, use the **default cache** flow monitor configuration command.

> **Note** When a cache becomes full, new flows will not be monitored.

Examples

The following example shows how to configure the active timeout for the flow monitor cache:

```
Switch(config)# flow monitor FLOW-MONITOR-1
Switch(config-flow-monitor)# cache timeout active 4800
```

The following example shows how to configure the inactive timer for the flow monitor cache:

```
Switch(config)# flow monitor FLOW-MONITOR-1
Switch(config-flow-monitor)# cache timeout inactive 30
```

The following example shows how to configure a normal cache:

```
Switch(config)# flow monitor FLOW-MONITOR-1
Switch(config-flow-monitor)# cache type normal
```

Related Commands

Command	Description
flow monitor	Creates a flow monitor, or modifies an existing flow monitor, and enters flow monitor configuration mode.

clear flow exporter

To clear the statistics for a Flexible NetFlow flow exporter, use the **clear flow exporter** command in privileged EXEC mode.

clear flow exporter [[**name**] *exporter-name*] **statistics**

Syntax Description

name	(Optional) Specifies the name of a flow exporter.
exporter-name	(Optional) Name of a flow exporter that was previously configured.
statistics	Clears the flow exporter statistics.

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines

The **clear flow exporter** command removes all statistics from the flow exporter. These statistics will not be exported and the data gathered in the cache will be lost.

You can view the flow exporter statistics by using the **show flow exporter statistics** privileged EXEC command.

Examples

The following example clears the statistics for all of the flow exporters configured on the switch:

```
Switch# clear flow exporter statistics
```

The following example clears the statistics for the flow exporter named FLOW-EXPORTER-1:

```
Switch# clear flow exporter FLOW-EXPORTER-1 statistics
```

Related Commands

Command	Description
debug flow exporter	Enables debugging output for Flexible NetFlow flow exporters.
show flow exporter	Displays flow exporter status and statistics.

clear flow monitor

To clear a flow monitor cache or flow monitor statistics and to force the export of the data in the flow monitor cache, use the **clear flow monitor** command in privileged EXEC mode.

clear flow monitor [**name**] *monitor-name* [[**cache**] **force-export**| **statistics**]

Syntax Description

name	Specifies the name of a flow monitor.
monitor-name	Name of a flow monitor that was previously configured.
cache	(Optional) Clears the flow monitor cache information.
force-export	(Optional) Forces the export of the flow monitor cache statistics.
statistics	(Optional) Clears the flow monitor statistics.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines   The **clear flow monitor cache** command removes all entries from the flow monitor cache. These entries will not be exported and the data gathered in the cache will be lost.

Note   The statistics for the cleared cache entries are maintained.

The **clear flow monitor force-export** command removes all entries from the flow monitor cache and exports them using all flow exporters assigned to the flow monitor. This action can result in a short-term increase in CPU usage. Use this command with caution.

The **clear flow monitor statistics** command clears the statistics for this flow monitor.

Note   The current entries statistic will not be cleared by the **clear flow monitor statistics** command because this is an indicator of how many entries are in the cache and the cache is not cleared with this command.

You can view the flow monitor statistics by using the **show flow monitor statistics** privileged EXEC command.

Examples

The following example clears the statistics and cache entries for the flow monitor named FLOW-MONITOR-1:

```
Switch# clear flow monitor name FLOW-MONITOR-1
```

The following example clears the statistics and cache entries for the flow monitor named FLOW-MONITOR-1 and forces an export:

```
Switch# clear flow monitor name FLOW-MONITOR-1 force-export
```

The following example clears the cache for the flow monitor named FLOW-MONITOR-1 and forces an export:

```
Switch# clear flow monitor name FLOW-MONITOR-1 cache force-export
```

The following example clears the statistics for the flow monitor named FLOW-MONITOR-1:

```
Switch# clear flow monitor name FLOW-MONITOR-1 statistics
```

Related Commands

Command	Description
debug flow monitor	Enables debugging output for Flexible NetFlow flow monitors.
show flow monitor	Displays the status and statistics for a Flexible NetFlow flow monitor.

collect

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, use the **collect** command in flow record configuration mode.

collect {**counter**| **interface**| **timestamp**| **transport**| **wireless**}

Syntax Description

counter	Configures the number of bytes or packets in a flow as a non-key field for a flow record. For more information, see collect counter, on page 23.
interface	Configures the input and output interface name as a non-key field for a flow record. For more information, see collect interface, on page 25.
timestamp	Configures the absolute time of the first seen or last seen packet in a flow as a non-key field for a flow record. For more information, see collect timestamp absolute, on page 27.
transport	Enables the collecting of transport TCP flags from a flow record. For more information, see collect transport tcp flags, on page 29.
wireless	Enables the collection of access point MAC addresses. For more information, see collect wireless ap mac address (wireless), on page 31.

Command Default   Non-key fields are not configured for the flow monitor record.

Command Modes   Flow record configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines   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 **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.

> **Note** Although it is visible in the command-line help string, the **flow username** keyword is not supported.

Examples The following example configures the total number of bytes in the flows as a non-key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# collect counter bytes long
```

Related Commands

Command	Description
collect counter	Configures the number of bytes or packets in a flow as a non-key field for a flow record.
collect interface	Configures the input and output interface as a non-key field for a flow record.
collect timestamp absolute	Configures the absolute time of the first seen or last seen packet in a flow as a non-key field for a flow record.
collect transport tcp flags	Enables the collecting of TCP flag values from a flow.
collect wireless ap mac address (wireless)	Collects the MAC addresses of the access points that the wireless client is associated with.

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.

collect counter {**bytes layer2 long**| **bytes long**| **packets long**}

no collect counter {**bytes layer2 long**| **bytes long**| **packets long**}

Syntax Description

bytes layer2 long	Configures the number of Layer 2 bytes seen in a flow as a non-key field, and enables collecting the total number of Layer 2 bytes from the flow using a 64-bit counter.
bytes long	Configures the number of bytes seen in a flow as a non-key field, and enables collecting the total number of bytes from the flow using a 64-bit counter.
packets long	Configures the number of packets seen in a flow as a non-key field and enables collecting the total number of packets from the flow using a 64-bit counter.

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 3.3SE	This command was introduced.

Usage Guidelines The **collect counter bytes long** command configures a 64-bit counter for the number of bytes seen in a flow.

The **collect counter packets long** command configures a 64-bit counter that will be incremented for each packet seen in the flow. It is unlikely that a 64-bit counter will ever restart at 0.

To return this command to its default settings, use the **no collect counter** or **default collect counter** flow record configuration command.

Examples The following example configures the total number of bytes in the flows as a non-key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)#collect counter bytes long
```

The following example configures the total number of packets from the flows as a non-key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# collect counter packets long
```

collect counter

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

collect interface

To configure the input and output interface name as a non-key field for a flow record, use the **collect interface** command in flow record configuration mode. To disable the use of the input and output interface as a non-key field for a flow record, use the **no** form of this command.

collect interface {**input**| **output**}

no collect interface {**input**| **output**}

Syntax Description

input	Configures the input interface name as a non-key field and enables collecting the input interface from the flows.
output	Configures the output interface name as a non-key field and enables collecting the output interface from the flows.

Command Default   The input and output interface names are not configured as a non-key field.

Command Modes   Flow record configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	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.

To return this command to its default settings, use the **no collect interface** or **default collect interface** flow record configuration command.

Examples   The following example configures the output interface as a non-key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# collect interface output
```

The following example configures the input interface as a non-key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# collect interface input
```

collect interface

Related Commands

Command	Description
flow exporter	Creates a Flexible NetFlow flow exporter, or modifies an existing Flexible NetFlow flow exporter, and enters Flexible NetFlow flow exporter configuration mode.
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

collect timestamp absolute

To configure the absolute time of the first seen or last seen packet in a flow as a non-key field for a flow record, use the **collect timestamp absolute** command in flow record configuration mode. To disable the use of the first seen or last seen packet in a flow as a non-key field for a flow record, use the **no** form of this command.

collect timestamp absolute {**first**| **last**}

no collect timestamp absolute {**first**| **last**}

Syntax Description

first	Configures the absolute time of the first seen packet in a flow as a non-key field and enables collecting time stamps from the flows.
last	Configures the absolute time of the last seen packet in a flow as a non-key field and enables collecting time stamps from the flows.

Command Default   The absolute time field is not configured as a non-key field.

Command Modes   Flow record configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines   The **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.

Examples   The following example configures time stamps based on the absolute time of the first seen packet in a flow as a non-key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# collect timestamp absolute first
```

The following example configures time stamps based on the absolute time of the last seen packet in a flow as a non-key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# collect timestamp absolute last
```

collect timestamp absolute

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

collect transport tcp flags

To enable the collecting of transport TCP flags from a flow, use the **collect transport tcp flags** command in flow record configuration mode. To disable the collecting of transport TCP flags from the flow, use the **no** form of this command.

collect transport tcp flags

no collect transport tcp flags

Syntax Description   This command has no arguments or keywords.

Command Default   The transport layer fields are not configured as a non-key field.

Command Modes   Flow record configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines   The values of the transport layer fields are taken from all packets in the flow. You cannot specify which TCP flag to collect. You can only specify to collect transport TCP flags. All TCP flags will be collected with this command. The following transport TCP flags are collected:

- **ack**—TCP acknowledgement flag
- **cwr**—TCP congestion window reduced flag
- **ece**—TCP ECN echo flag
- **fin**—TCP finish flag
- **psh**—TCP push flag
- **rst**—TCP reset flag
- **syn**—TCP synchronize flag
- **urg**—TCP urgent flag

To return this command to its default settings, use the **no collect collect transport tcp flags** or **default collect collect transport tcp flags** flow record configuration command.

Examples   The following example collects the TCP flags from a flow:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# collect transport tcp flags
```

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

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 3.3SE	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.

Examples   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:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# collect wireless ap mac address
```

Related Commands

Command	Description
collect	Configures non-key fields for the flow monitor record and enables capturing the values in the fields for the flow created with the record.

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 3.3SE	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.

Examples   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:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# collect wireless client mac address
```

Output:

datalink flow monitor

To apply a Flexible NetFlow flow monitor to an interface, use the **datalink flow monitor** command in interface configuration mode. To disable a Flexible NetFlow flow monitor, use the **no** form of this command.

datalink flow monitor *monitor-name* {**input**| **output**| **sampler** *sampler-name*}

no datalink flow monitor *monitor-name* {**input**| **output**| **sampler** *sampler-name*}

Syntax Description

monitor-name	Name of the flow monitor to apply to the interface.
sampler *sampler-name*	Enables the specified flow sampler for the flow monitor.
input	Monitors traffic that the switch receives on the interface.
output	Monitors traffic that the switch sends on the interface.

Command Default   A flow monitor is not enabled.

Command Modes   Interface configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines   Before you apply a flow monitor to an interface with the **datalink flow monitor** command, you must have already created the flow monitor using the **flow monitor** global configuration command and the flow sampler using the **sampler** global configuration command.

To enable a flow sampler for the flow monitor, you must have already created the sampler.

Note   The **datalink flow monitor** command only monitors non-IPv4 and non-IPv6 traffic. To monitor IPv4 traffic, use the **ip flow monitor** command. To monitor IPv6 traffic, use the **ipv6 flow monitor** command.

Examples   This example shows how to enable Flexible NetFlow datalink monitoring on an interface:

```
Switch(config)# interface gigabitethernet1/0/1
Switch(config-if)# datalink flow monitor FLOW-MONITOR-1 sampler FLOW-SAMPLER-1 input
```

Related Commands

Command	Description
flow monitor	Creates a flow monitor, or modifies an existing flow monitor, and enters flow monitor configuration mode.

datalink flow monitor (wireless)

To enable NetFlow monitoring in a WLAN, use the **datalink flow monitor** command in WLAN configuration mode. To disable NetFlow monitoring, use the **no** form of this command.

datalink flow monitor *datalink-monitor-name*{**input | output**}

no datalink flow monitor *datalink-monitor-name*{**input | output**}

Syntax Description

datalink-monitor-name	Flow monitor name. The name is case sensitive and consists of alphanumeric characters, with a maximum of 31 characters.
input	Specifies the NetFlow monitor for ingress traffic.
output	Specifies the NetFlow monitor for egress traffic.

Command Default   Flow monitor is not configured by default for WLAN interface.

Command Modes   WLAN configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines   Before you apply a flow monitor to an interface with the **datalink flow monitor** command, you must have already created the flow monitor using the **flow monitor** global configuration command.

Examples   This example shows how to enable NetFlow monitoring on a WLAN:

```
Switch(config)# wlan wlan1
Switch(config-wlan)# datalink flow monitor test output
```

This example shows how to disable NetFlow monitor on a WLAN:

```
Switch(config)# wlan wlan1
Switch(config-wlan)# no datalink flow monitor test output
```

Related Commands

Command	Description
flow monitor	Creates a flow monitor, or modifies an existing flow monitor, and enters flow monitor configuration mode.

debug flow exporter

To enable debugging output for Flexible NetFlow flow exporters, use the **debug flow exporter** command in privileged EXEC mode. To disable debugging output, use the **no** form of this command.

debug flow exporter [[**name**] *exporter-name*] [**error**| **event**| **packets** *number*]

no debug flow exporter [[**name**] *exporter-name*] [**error**| **event**| **packets** *number*]

Syntax Description

name	(Optional) Specifies the name of a flow exporter.
exporter-name	(Optional) The name of a flow exporter that was previously configured.
error	(Optional) Enables debugging for flow exporter errors.
event	(Optional) Enables debugging for flow exporter events.
packets	(Optional) Enables packet-level debugging for flow exporters.
number	(Optional) The number of packets to debug for packet-level debugging of flow exporters. The range is 1 to 65535.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Examples   The following example indicates that a flow exporter packet has been queued for process send:

```
Switch# debug flow exporter
May 21 21:29:12.603: FLOW EXP: Packet queued for process send
```

Related Commands

Command	Description
clear flow exporter	Clears the statistics for a Flexible NetFlow flow exporter.

debug flow monitor

To enable debugging output for Flexible NetFlow flow monitors, use the **debug flow monitor** command in privileged EXEC mode. To disable debugging output, use the **no** form of this command.

debug flow monitor [**error**| [**name**] *monitor-name* [**cache** [**error**]| **error**| **packets** *packets*]]

no debug flow monitor [**error**| [**name**] *monitor-name* [**cache** [**error**]| **error**| **packets** *packets*]]

Syntax Description

error	(Optional) Enables debugging for flow monitor errors for all flow monitors or for the specified flow monitor.
name	(Optional) Specifies the name of a flow monitor.
monitor-name	(Optional) Name of a flow monitor that was previously configured.
cache	(Optional) Enables debugging for the flow monitor cache.
cache error	(Optional) Enables debugging for flow monitor cache errors.
packets	(Optional) Enables packet-level debugging for flow monitors.
packets	(Optional) Number of packets to debug for packet-level debugging of flow monitors. The range is 1 to 65535.

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Examples

The following example shows that the cache for FLOW-MONITOR-1 was deleted:

```
Switch# debug flow monitor FLOW-MONITOR-1 cache
May 21 21:53:02.839: FLOW MON:  'FLOW-MONITOR-1' deleted cache
```

Related Commands

Command	Description
clear flow monitor	Clears a flow monitor cache or flow monitor statistics and forces the export of the data in the flow monitor cache.

debug flow record

To enable debugging output for Flexible NetFlow flow records, use the **debug flow record** command in privileged EXEC mode. To disable debugging output, use the **no** form of this command.

debug flow record [[**name**] *record-name*| **options** {**sampler-table**}| [**detailed**| **error**]]

no debug flow record [[**name**] *record-name*| **options** {**sampler-table**}| [**detailed**| **error**]]

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.
options	(Optional) Includes information on other flow record options.
sampler-table	(Optional) Includes information on the sampler tables.
detailed	(Optional) Displays detailed information.
error	(Optional) Displays errors only.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Examples   The following example enables debugging for the flow record:

```
Switch# debug flow record FLOW-record-1
```

debug sampler

To enable debugging output for Flexible NetFlow samplers, use the **debug sampler** command in privileged EXEC mode. To disable debugging output, use the **no** form of this command.

debug sampler [**detailed**| **error**| [**name**] *sampler-name* [**detailed**| **error**| **sampling** *samples*]]

no debug sampler [**detailed**| **error**| [**name**] *sampler-name* [**detailed**| **error**| **sampling**]]

Syntax Description

detailed	(Optional) Enables detailed debugging for sampler elements.
error	(Optional) Enables debugging for sampler errors.
name	(Optional) Specifies the name of a sampler.
sampler-name	(Optional) Name of a sampler that was previously configured.
sampling *samples*	(Optional) Enables debugging for sampling and specifies the number of samples to debug.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Examples   The following sample output shows that the debug process has obtained the ID for the sampler named SAMPLER-1:

```
Switch# debug sampler detailed
*May 28 04:14:30.883: Sampler: Sampler(SAMPLER-1: flow monitor FLOW-MONITOR-1 (ip,Et1/0,O)
 get ID succeeded:1
*May 28 04:14:30.971: Sampler: Sampler(SAMPLER-1: flow monitor FLOW-MONITOR-1 (ip,Et0/0,I)
 get ID succeeded:1
```

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 3.3SE	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.

Examples The following example configures a description for a flow monitor:

```
Switch(config)# flow monitor FLOW-MONITOR-1
Switch(config-flow-monitor)# description Monitors traffic to 172.16.0.1 255.255.0.0
```

Related Commands

Command	Description
flow exporter	Creates a Flexible NetFlow flow exporter, or modifies an existing Flexible NetFlow flow exporter, and enters Flexible NetFlow flow exporter configuration mode.
flow monitor	Creates a flow monitor, or modifies an existing flow monitor, and enters flow monitor configuration mode.
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

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*} **vrf** *vrf-label*

no destination {*hostname*| *ip-address*} **vrf** *vrf-label*

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.
vrf	(Optional) Specifies that the export data packets are to be sent to the named Virtual Private Network (VPN) routing and forwarding (VRF) instance for routing to the destination, instead of to the global routing table.
vrf-label	Name of the VRF instance.

Command Default   An export destination is not configured.

Command Modes   Flow exporter configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	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 switch 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.

Examples   The following example shows how to configure the networking device to export the Flexible NetFlow cache entry to a destination system:

```
Switch(config)# flow exporter FLOW-EXPORTER-1
Switch(config-flow-exporter)# destination 10.0.0.4
```

destination

The following example shows how to configure the networking device to export the Flexible NetFlow cache entry to a destination system using a VRF named VRF-1:

```
Switch(config)# flow exporter FLOW-EXPORTER-1
Switch(config-flow-exporter)# destination 172.16.0.2 vrf VRF-1
```

Related Commands

Command	Description
flow exporter	Creates a Flexible NetFlow flow exporter, or modifies an existing Flexible NetFlow flow exporter, and enters Flexible NetFlow flow exporter configuration mode.

dscp

To configure a differentiated services code point (DSCP) value for flow exporter datagrams, use the **dscp** command in flow exporter configuration mode. To remove a DSCP value for flow exporter datagrams, use the **no** form of this command.

dscp *dscp*

no dscp *dscp*

Syntax Description	*dscp*	DSCP to be used in the DSCP field in exported datagrams. The range is 0 to 63. The default is 0.

Command Default   The differentiated services code point (DSCP) value is 0.

Command Modes   Flow exporter configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines   To return this command to its default setting, use the **no dscp** or **default dscp** flow exporter configuration command.

Examples   The following example sets 22 as the value of the DSCP field in exported datagrams:

```
Switch(config)# flow exporter FLOW-EXPORTER-1
Switch(config-flow-exporter)# dscp 22
```

Related Commands

Command	Description
flow exporter	Creates a Flexible NetFlow flow exporter, or modifies an existing Flexible NetFlow flow exporter, and enters Flexible NetFlow flow exporter configuration mode.

export-protocol netflow-v9

To configure NetFlow Version 9 export as the export protocol for a Flexible NetFlow exporter, use the **export-protocol netflow-v9** command in flow exporter configuration mode.

export-protocol netflow-v9

Syntax Description   This command has no arguments or keywords.

Command Default   NetFlow Version 9 is enabled.

Command Modes   Flow exporter configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines   The switch does not support NetFlow v5 export format, only NetFlow v9 export format is supported.

Examples   The following example configures NetFlow Version 9 export as the export protocol for a NetFlow exporter:

```
Switch(config)# flow exporter FLOW-EXPORTER-1
Switch(config-flow-exporter)# export-protocol netflow-v9
```

Related Commands

Command	Description
flow exporter	Creates a Flexible NetFlow flow exporter, or modifies an existing Flexible NetFlow flow exporter, and enters Flexible NetFlow flow exporter configuration mode.

exporter

To add a flow exporter for a flow monitor, use the **exporter** command in the appropriate configuration mode. To remove a flow exporter for a flow monitor, use the **no** form of this command.

exporter *exporter-name*

no exporter *exporter-name*

Syntax Description	*exporter-name*	Name of a flow exporter that was previously configured.

Command Default   An exporter is not configured.

Command Modes   Flow monitor configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines   You must have already created a flow exporter by using the **flow exporter** command before you can apply the flow exporter to a flow monitor with the **exporter** command.

To return this command to its default settings, use the **no exporter** or **default exporter** flow monitor configuration command.

Examples   The following example configures an exporter for a flow monitor:

```
Switch(config)# flow monitor FLOW-MONITOR-1
Switch(config-flow-monitor)# exporter EXPORTER-1
```

Related Commands

Command	Description
flow exporter	Creates a Flexible NetFlow flow exporter, or modifies an existing Flexible NetFlow flow exporter, and enters Flexible NetFlow flow exporter configuration mode.
flow monitor	Creates a flow monitor, or modifies an existing flow monitor, and enters flow monitor configuration mode.

flow exporter

To create a Flexible NetFlow flow exporter, or to modify an existing Flexible NetFlow flow exporter, and enter Flexible NetFlow flow exporter configuration mode, use the **flow exporter** command in global configuration mode. To remove a Flexible NetFlow 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

Flexible NetFlow flow exporters are not present in the configuration.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	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 Flexible NetFlow flow exporter configuration mode:

```
Switch(config)# flow exporter FLOW-EXPORTER-1
Switch(config-flow-exporter)#
```

Related Commands

Command	Description
clear flow exporter	Clears the statistics for a Flexible NetFlow flow exporter.
debug flow exporter	Enables debugging output for Flexible NetFlow flow exporters.
show flow exporter	Displays flow exporter status and statistics.

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 Flexible NetFlow flow monitors are not present in the configuration.

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines Flow monitors are the Flexible NetFlow 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:

```
Switch(config)# flow monitor FLOW-MONITOR-1
Switch(config-flow-monitor)#
```

Related Commands

Command	Description
clear flow monitor	Clears a flow monitor cache or flow monitor statistics and forces the export of the data in the flow monitor cache.
debug flow monitor	Enables debugging output for Flexible NetFlow flow monitors.
show flow monitor	Displays the status and statistics for a Flexible NetFlow flow monitor.

flow record

To create a Flexible NetFlow flow record, or to modify an existing Flexible NetFlow flow record, and enter Flexible NetFlow flow record configuration mode, use the **flow record** command in global configuration mode. To remove a Flexible NetFlow 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 Flexible NetFlow flow record is not configured.

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines   A flow record defines the keys that Flexible NetFlow uses to identify packets in the flow, as well as other fields of interest that Flexible NetFlow gathers for the flow. You can define a flow record with any combination of keys and fields of interest. The switch 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 Flexible NetFlow flow record configuration mode:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)#
```

Related Commands

Command	Description
show flow record	Displays the status and statistics for a Flexible NetFlow flow record.

ip flow monitor

To enable a Flexible NetFlow flow monitor for IPv4 traffic that the switch is receiving or forwarding, use the **ip flow monitor** command in interface configuration mode. To disable a flow monitor, use the **no** form of this command.

ip flow monitor *monitor-name* [**sampler** *sampler-name*] {**input**| **output**}

no ip flow monitor *monitor-name* [**sampler** *sampler-name*] {**input**| **output**}

Syntax Description

monitor-name	Name of the flow monitor to apply to the interface.
sampler *sampler-name*	(Optional) Enables the specified flow sampler for the flow monitor.
input	Monitors IPv4 traffic that the switch receives on the interface.
output	Monitors IPv4 traffic that the switch transmits on the interface.

Command Default

A flow monitor is not enabled.

Command Modes

Interface configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines

Before you can apply a flow monitor to an interface with the **ip flow monitor** command, you must have already created the flow monitor using the **flow monitor** global configuration command.

When you add a sampler to a flow monitor, only packets that are selected by the named sampler will be entered into the cache to form flows. Each use of a sampler causes separate statistics to be stored for that usage.

You cannot add a sampler to a flow monitor after the flow monitor has been enabled on the interface. You must first remove the flow monitor from the interface and then enable the same flow monitor with a sampler.

Note   The statistics for each flow must be scaled to give the expected true usage. For example, with a 1 in 100 sampler it is expected that the packet and byte counters will have to be multiplied by 100.

Examples

The following example enables a flow monitor for monitoring input traffic:

```
Switch(config)# interface gigabitethernet1/0/1
Switch(config-if)# ip flow monitor FLOW-MONITOR-1 input
```

The following example enables the same flow monitor on the same interface for monitoring input and output traffic:

```
Switch(config)# interface gigabitethernet1/0/1
Switch(config-if)# ip flow monitor FLOW-MONITOR-1 input
Switch(config-if)# ip flow monitor FLOW-MONITOR-1 output
```

The following example enables two different flow monitors on the same interface for monitoring input and output traffic:

```
Switch(config)# interface gigabitethernet1/0/1
Switch(config-if)# ip flow monitor FLOW-MONITOR-1 input
Switch(config-if)# ip flow monitor FLOW-MONITOR-2 output
```

The following example enables the same flow monitor on two different interfaces for monitoring input and output traffic:

```
Switch(config)# interface gigabitethernet1/0/1
Switch(config-if)# ip flow monitor FLOW-MONITOR-1 input
Switch(config-if)# exit
Switch(config)# interface gigabitethernet2/0/3
Switch(config-if)# ip flow monitor FLOW-MONITOR-1 output
```

The following example enables a flow monitor for monitoring input traffic, with a sampler to limit the input packets that are sampled:

```
Switch(config)# interface gigabitethernet1/0/1
Switch(config-if)# ip flow monitor FLOW-MONITOR-1 sampler SAMPLER-1 input
```

The following example shows what happens when you try to add a sampler to a flow monitor that has already been enabled on an interface without a sampler:

```
Switch(config)# interface gigabitethernet1/0/1
Switch(config-if)# ip flow monitor FLOW-MONITOR-1 sampler SAMPLER-2 input
% Flow Monitor: Flow Monitor 'FLOW-MONITOR-1' is already on in full mode and cannot be
enabled with a sampler.
```

The following example shows how to remove a flow monitor from an interface so that it can be enabled with the sampler:

```
Switch(config)# interface gigabitethernet1/0/1
Switch(config-if)# no ip flow monitor FLOW-MONITOR-1 input
Switch(config-if)# ip flow monitor FLOW-MONITOR-1 sampler SAMPLER-2 input
```

Related Commands

Command	Description
flow monitor	Creates a flow monitor, or modifies an existing flow monitor, and enters flow monitor configuration mode.
sampler	Creates a Flexible NetFlow flow sampler, or modifies an existing Flexible NetFlow flow sampler.

ipv6 flow monitor

To enable a flow monitor for IPv6 traffic that the switch is receiving or forwarding, use the **ipv6 flow monitor** command in interface configuration mode. To disable a flow monitor, use the **no** form of this command.

ipv6 flow monitor *monitor-name* [**sampler** *sampler-name*] {**input**| **output**}

no ipv6 flow monitor *monitor-name* [**sampler** *sampler-name*] {**input**| **output**}

Syntax Description

monitor-name	Name of the flow monitor to apply to the interface.
sampler *sampler-name*	(Optional) Enables the specified flow sampler for the flow monitor.
input	Monitors IPv6 traffic that the switch receives on the interface.
output	Monitors IPv6 traffic that the switch transmits on the interface.

Command Default   A flow monitor is not enabled.

Command Modes   Interface configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines   Before you can apply a flow monitor to the interface with the **ipv6 flow monitor** command, you must have already created the flow monitor using the **flow monitor** global configuration command.

When you add a sampler to a flow monitor, only packets that are selected by the named sampler will be entered into the cache to form flows. Each use of a sampler causes separate statistics to be stored for that usage.

You cannot add a sampler to a flow monitor after the flow monitor has been enabled on the interface. You must first remove the flow monitor from the interface and then enable the same flow monitor with a sampler.

Note   The statistics for each flow must be scaled to give the expected true usage. For example, with a 1 in 100 sampler it is expected that the packet and byte counters will have to be multiplied by 100.

Examples

The following example enables a flow monitor for monitoring input traffic:

```
Switch(config)# interface gigabitethernet1/0/1
Switch(config-if)# ipv6 flow monitor FLOW-MONITOR-1 input
```

The following example enables the same flow monitor on the same interface for monitoring input and output traffic:

```
Switch(config)# interface gigabitethernet1/0/1
Switch(config-if)# ipv6 flow monitor FLOW-MONITOR-1 input
Switch(config-if)# ipv6 flow monitor FLOW-MONITOR-1 output
```

The following example enables two different flow monitors on the same interface for monitoring input and output traffic:

```
Switch(config)# interface gigabitethernet1/0/1
Switch(config-if)# ipv6 flow monitor FLOW-MONITOR-1 input
Switch(config-if)# ipv6 flow monitor FLOW-MONITOR-2 output
```

The following example enables the same flow monitor on two different interfaces for monitoring input and output traffic:

```
Switch(config)# interface gigabitethernet1/0/1
Switch(config-if)# ipv6 flow monitor FLOW-MONITOR-1 input
Switch(config-if)# exit
Switch(config)# interface gigabitethernet2/0/3
Switch(config-if)# ipv6 flow monitor FLOW-MONITOR-1 output
```

The following example enables a flow monitor for monitoring input traffic, with a sampler to limit the input packets that are sampled:

```
Switch(config)# interface gigabitethernet1/0/1
Switch(config-if)# ipv6 flow monitor FLOW-MONITOR-1 sampler SAMPLER-1 input
```

The following example shows what happens when you try to add a sampler to a flow monitor that has already been enabled on an interface without a sampler:

```
Switch(config)# interface gigabitethernet1/0/1
Switch(config-if)# ipv6 flow monitor FLOW-MONITOR-1 sampler SAMPLER-2 input
% Flow Monitor: Flow Monitor 'FLOW-MONITOR-1' is already on in full mode and cannot be
enabled with a sampler.
```

The following example shows how to remove a flow monitor from an interface so that it can be enabled with the sampler:

```
Switch(config)# interface gigabitethernet1/0/1
Switch(config-if)# no ipv6 flow monitor FLOW-MONITOR-1 input
Switch(config-if)# ipv6 flow monitor FLOW-MONITOR-1 sampler SAMPLER-2 input
```

Related Commands

Command	Description
flow monitor	Creates a flow monitor, or modifies an existing flow monitor, and enters flow monitor configuration mode.
sampler	Creates a Flexible NetFlow flow sampler, or modifies an existing Flexible NetFlow flow sampler.

ip flow monitor (wireless)

To configure IPv4 NetFlow monitoring, use the **ip flow monitor** command in WLAN configuration mode. To remove IPv4 NetFlow monitoring, use the **no** form of this command.

ip flow monitor *ip-monitor-name* {**input** | **output**}

no ip flow monitor *ip-monitor-name* {**input** | **output**}

Syntax Description

ip-monitor-name	Flow monitor name.
input	Enables a flow monitor for IPv4 ingress traffic.
output	Enables a flow monitor for IPv4 egress traffic.

Command Default

A flow monitor is not enabled.

Command Modes

WLAN configuration

Usage Guidelines

Before you can apply a IPv4 flow monitor to an interface with the **ip flow monitor** command, you need to create the flow monitor using the **flow monitor** global configuration command.

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Examples

This example shows how to configure an IP flow monitor for ingress traffic:

```
Switch(config)# wlan wlan1
Switch(config-wlan)# ip flow monitor test input
```

This example shows how to disable an IP flow monitor:

```
Switch(config)# wlan wlan1
Switch(config-wlan)# no ip flow monitor test input
```

ipv6 flow monitor (wireless)

To configure IPv6 NetFlow monitoring, use the **ipv6 flow monitor** command in wlan configuration mode. To remove IPv6 NetFlow monitoring, use the **no** form of this command.

ipv6 flow monitor *ipv6-monitor-name* {**input** | **output**}

no ipv6 flow monitor *ipv6-monitor-name* {**input** | **output**}

Syntax Description

ipv6-monitor-name	Flow monitor name.
input	Enables a flow monitor for IPv6 ingress traffic.
output	Enables a flow monitor for IPv6 egress traffic.

Command Default   A flow monitor is not enabled.

Command Modes   Wlan configuration

Usage Guidelines   Before you can apply an IPv6 flow monitor to an interface with the **ipv6 flow monitor** command, you need to create the flow monitor using the **flow monitor** global configuration command.

The collect commands are used to configure nonkey 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 nonkey fields are added to flows to provide additional information about the traffic in the flows. A change in the value of a nonkey field does not create a new flow. In most cases the values for nonkey fields are taken from only the first packet in the flow.

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Examples   This example shows how to configure an IPv6 flow monitor for ingress traffic:

```
Switch(config)# wlan wlan1
Switch(config-wlan)# ipv6 flow monitor test input
```

This example shows how to disable an IPv6 flow monitor:

```
Switch(config)# wlan wlan1
Switch(config-wlan)# no ipv6 flow monitor test input
```

match application name (wireless)

This command is specific to the Application Visibility and Control (AVC) feature. To specify a match to the application name, use the **match application name** 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, by default.

Command Modes   Flow record configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines   This command is specific to the AVC feature. For more information, see the *System Management Configuration Guide, Cisco IOS XE Release 3SE*.

Examples   This command is specific to the AVC feature. For examples, see the *System Management Configuration Guide, Cisco IOS XE Release 3SE*.

match datalink dot1q priority

To configure the 802.1Q (dot1q) priority value as a key field for a flow record, use the **match datalink dot1q priority** command in flow record configuration mode. To disable the use of the priority as a key field for a flow record, use the **no** form of this command.

match datalink dot1q priority

no match datalink dot1q priority

Syntax Description

This command has no arguments or keywords.

Command Default

The priority field is not configured as a key field.

Command Modes

Flow record configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	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 observation point of the **match datalink dot1q priority** command is the interface to which the flow monitor that contains the flow record with the command is applied.

Examples

The following example configures the 802.1Q priority as a key field for a flow record:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match datalink dot1q priority
```

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

match datalink dot1q vlan

To configure the 802.1Q (dot1q) VLAN value as a key field for a flow record, use the **match datalink dot1q vlan** command in flow record configuration mode. To disable the use of the 802.1Q VLAN value as a key field for a flow record, use the **no** form of this command.

match datalink dot1q vlan {**input**| **output**}

no match datalink dot1q vlan {**input**| **output**}

Syntax Description

input	Configures the VLAN ID of traffic being received by the switch as a key field.
output	Configures the VLAN ID of traffic being transmitted by the switch as a key field.

Command Default   The 802.1Q VLAN ID is not configured as a key field.

Command Modes   Flow record configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	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 input and output keywords of the **match datalink dot1q vlan** command are used to specify the observation point that is used by the **match datalink dot1q vlan** command to create flows based on the unique 802.1q VLAN IDs in the network traffic.

Examples   The following example configures the 802.1Q VLAN ID of traffic being received by the switch as a key field for a flow record:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match datalink dot1q vlan input
```

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

match datalink ethertype

To configure the EtherType of the packet as a key field for a flow record, use the **match datalink ethertype** command in flow record configuration mode. To disable the EtherType of the packet as a key field for a flow record, use the **no** form of this command.

match datalink ethertype

no match datalink ethertype

Syntax Description   This command has no arguments or keywords.

Command Default   The EtherType of the packet is not configured as a key field.

Command Modes   Flow record configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	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.

When you configure the EtherType of the packet as a key field for a flow record using the **match datalink ethertype** command, the traffic flow that is created is based on the type of flow monitor that is assigned to the interface:

- When a datalink flow monitor is assigned to an interface using the **datalink flow monitor** interface configuration command, it creates unique flows for different Layer 2 protocols.

- When an IP flow monitor is assigned to an interface using the **ip flow monitor** interface configuration command, it creates unique flows for different IPv4 protocols.

- When an IPv6 flow monitor is assigned to an interface using the **ipv6 flow monitor** interface configuration command, it creates unique flows for different IPv6 protocols.

To return this command to its default settings, use the **no match datalink ethertype** or **default match datalink ethertype** flow record configuration command.

Examples   The following example configures the EtherType of the packet as a key field for a Flexible NetFlow flow record:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match datalink ethertype
```

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

match datalink mac

To configure the use of MAC addresses as a key field for a flow record, use the **match datalink mac** command in flow record configuration mode. To disable the use of MAC addresses as a key field for a flow record, use the **no** form of this command.

match datalink mac {**destination address** {**input**| **output**}| **source address** {**input**| **output**}}

no match datalink mac {**destination address**{**input**| **output**}| **source address**{**input**| **output**}}

Syntax Description

destination address	Configures the use of the destination MAC address as a key field.
input	Specifies the MAC address of input packets.
output	Specifies the MAC address of output packets.
source address	Configures the use of the source MAC address as a key field.

Command Default MAC addresses are not configured as a key field.

Command Modes Flow record configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	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 **input** and **output** keywords are used to specify the observation point that is used by the **match datalink mac** command to create flows based on the unique MAC addressees in the network traffic.

Note When a datalink flow monitor is assigned to an interface or VLAN record, it creates flows only for non-IPv6 or non-IPv4 traffic.

To return this command to its default settings, use the **no match datalink mac** or **default match datalink mac** flow record configuration command.

Examples

The following example configures the use of the source MAC addresses of packets that are transmitted by the switch as a key field for a flow record:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match datalink mac source address output
```

The following example configures the use of the destination MAC address of packets that are received by the switch as a key field for a flow record:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match datalink mac destination address input
```

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

match datalink vlan

To configure the VLAN ID as a key field for a flow record, use the **match datalink vlan** command in flow record configuration mode. To disable the use of the VLAN ID value as a key field for a flow record, use the **no** form of this command.

match datalink vlan {**input**| **output**}

no match datalink vlan {**input**| **output**}

Syntax Description

input	Configures the VLAN ID of traffic being received by the switch as a key field.
output	Configures the VLAN ID of traffic being transmitted by the switch as a key field.

Command Default

The VLAN ID is not configured as a key field.

Command Modes

Flow record configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	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 **input** and **output** keywords of the **match datalink vlan** command are used to specify the observation point that is used by the **match datalink vlan** command to create flows based on the unique VLAN IDs in the network traffic.

Examples

The following example configures the VLAN ID of traffic being received by the switch as a key field for a flow record:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match datalink vlan input
```

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

match flow direction

To configure the flow direction as key fields for a flow record, use the **match flow direction** command in flow record configuration mode. To disable the use of the flow direction as key fields for a flow record, use the **no** form of this command.

match flow direction

no match flow direction

Syntax Description   This command has no arguments or keywords.

Command Default   The flow direction is not configured as key fields.

Command Modes   Flow record configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	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 **match flow direction** command captures the direction of the flow as a key field. This feature is most useful when a single flow monitor is configured for input and output flows. It can be used to find and eliminate flows that are being monitored twice, once on input and once on output. This command can help to match up pairs of flows in the exported data when the two flows are flowing in opposite directions.

Examples   The following example configures the direction the flow was monitored in as a key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match flow direction
```

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

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 3.3SE	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.

Examples

The following example configures the input interface as a key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match interface input
```

The following example configures the output interface as a key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match interface output
```

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

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**| **ttl**| **version**}

no match ipv4 {**destination address**| **protocol**| **source address**| **tos**| **ttl**| **version**}

Syntax Description

destination address	Configures the IPv4 destination address as a key field. For more information see match ipv4 destination address, on page 67.
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 68.
tos	Configures the IPv4 ToS as a key field.
ttl	Configures the IPv4 time-to-live (TTL) field as a key field for a flow record. For more information see match ipv4 ttl, on page 69.
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 3.3SE	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.

Examples

The following example configures the IPv4 protocol as a key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match ipv4 protocol
```

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

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 3.3SE	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.

Examples   The following example configures the IPv4 destination address as a key field for a flow record:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match ipv4 destination address
```

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

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 3.3SE	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.

Examples   The following example configures the IPv4 source address as a key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match ipv4 source address
```

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

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 3.3SE	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.

Examples   The following example configures IPv4 TTL as a key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match ipv4 ttl
```

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

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**| **hop-limit**| **protocol**| **source address**| **traffic-class**| **version**}

no match ipv6 {**destination address**| **hop-limit**| **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 72.
hop-limit	Configures the IPv6 hop limit as a key field. For more information see match ipv6 hop-limit, on page 73.
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 74.
traffic-class	Configures the IPv6 traffic class as a key field.
version	Configures the IPv6 version from IPv6 header as a key field.

Command Default

The IPv6 fields are not configured as a key field.

Command Modes

Flow record configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	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.

Examples

The following example configures the IPv6 protocol field as a key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match ipv6 protocol
```

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

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 3.3SE	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.

Examples   The following example configures the IPv6 destination address as a key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match ipv6 destination address
```

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

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 3.3SE	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.

Examples   The following example configures the hop limit of the packets in the flow as a key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match ipv6 hop-limit
```

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

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 3.3SE	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.

Examples   The following example configures a IPv6 source address as a key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match ipv6 source address
```

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

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.

match transport {**destination-port**| **icmp ipv4**| **icmp ipv6**| **igmp type**| **source-port**}

no match transport {**destination-port**| **icmp ipv4**| **icmp ipv6**| **igmp type**| **source-port**}

Syntax Description

destination-port	Configures the transport destination port as a key field.
icmp ipv4	Configures the ICMP IPv4 type field and the code field as key fields. For more information see, match transport icmp ipv4, on page 77.
icmp ipv6	Configures the ICMP IPv6 type field and the code field as key fields. For more information see, match transport icmp ipv6, on page 78.
igmp type	Configures time stamps based on the system uptime 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 3.3SE	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.

Examples   The following example configures the destination port as a key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match transport destination-port
```

The following example configures the source port as a key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match transport source-port
```

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

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 3.3SE	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.

Examples The following example configures the IPv4 ICMP code field as a key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match transport icmp ipv4 code
```

The following example configures the IPv4 ICMP type field as a key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match transport icmp ipv4 type
```

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

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 3.3SE	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.

Examples

The following example configures the IPv6 ICMP code field as a key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match transport icmp ipv6 code
```

The following example configures the IPv6 ICMP type field as a key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match transport icmp ipv6 type
```

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

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 3.3SE	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.

Examples   The following example configures the SSID of the wireless network as a key field:

```
Switch(config)# flow record FLOW-RECORD-1
Switch(config-flow-record)# match wireless ssid
```

Related Commands

Command	Description
flow record	Creates a Flexible NetFlow flow record, or modifies an existing Flexible NetFlow flow record, and enters Flexible NetFlow flow record configuration mode.

mode random 1 out-of

To enable random sampling and to specify the packet interval for a Flexible NetFlow sampler, use the **mode random 1 out-of** command in sampler configuration mode. To remove the packet interval information for a Flexible NetFlow sampler, use the **no** form of this command.

mode random 1 out-of *window-size*

no mode

Syntax Description

window-size	Specifies the window size from which to select packets. The range is 2 to 1024.

Command Default   The mode and the packet interval for a sampler are not configured.

Command Modes   Sampler configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines   A total of four unique samplers are supported on the switch. Packets are chosen in a manner that should eliminate any bias from traffic patterns and counter any attempt by users to avoid monitoring.

Note   The **deterministic** keyword is not supported, even though it is visible in the command-line help string.

Examples   The following example enables random sampling with a window size of 1000:

```
Switch(config)# sampler SAMPLER-1
Switch(config-sampler)# mode random 1 out-of 1000
```

Related Commands

Command	Description
debug sampler	Enables debugging output for Flexible NetFlow samplers.
show sampler	Displays the status and statistics for a Flexible NetFlow sampler.

option

To configure optional data parameters for a flow exporter for Flexible NetFlow, 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 {**application-table**| **exporter-stats**| **interface-table**| **sampler-table**| **usermac-table**} [**timeout** *seconds*]

no option {**application-table**| **exporter-stats**| **interface-table**| **sampler-table**| **usermac-table**}

Syntax Description

application-table	Configures the application table option for flow exporters.
	This keyword is specific to the AVC feature. For more information, see the *System Management Configuration Guide, Cisco IOS XE Release 3SE*.
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.
usermac-table	(Optional) Configures the wireless usermac to username table option.
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 3.3SE	This command was introduced.

Usage Guidelines   The **option application-table** command causes the periodic sending of an options table, which will allow the collector to map the Network Based Application Recognition (NBAR) application IDs provided in the flow records to application names. The optional timeout can alter the frequency at which the reports are sent. This keyword is specific to the AVC feature. For more information, see the *System Management Configuration Guide, Cisco IOS XE Release 3SE*.

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 usermac-table** command causes the periodic sending of an options table, which allows the collector to map the user names of the wireless clients provided in the flow records to their MAC address. 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.

Examples

The following example shows how to enable the periodic sending of the application option table, which allows the collector to map the application ID to the application name:

```
Switch(config)# flow exporter FLOW-EXPORTER-1
Switch(config-flow-exporter)# option application-table
```

The following example shows how to enable the periodic sending of the application option table at a lower frequency than usual, just once per day:

```
Switch(config)# flow exporter FLOW-EXPORTER-1
Switch(config-flow-exporter)#  option application-table timeout 86400
```
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:

```
Switch(config)# flow exporter FLOW-EXPORTER-1
Switch(config-flow-exporter)# option sampler-table
```
The following example shows how to enable the periodic sending of the usermac option table, which allows the collector to map the wireless user mac to the user name:

```
Switch(config)# flow exporter FLOW-EXPORTER-1
Switch(config-flow-exporter)# option usermac-table
```
The following example shows how to enable the periodic sending of the exporter statistics, including the number of records, bytes, and packets sent:

```
Switch(config)# flow exporter FLOW-EXPORTER-1
Switch(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:

```
Switch(config)# flow exporter FLOW-EXPORTER-1
Switch(config-flow-exporter)# option interface-table
```

Related Commands

Command	Description
flow exporter	Creates a Flexible NetFlow flow exporter, or modifies an existing Flexible NetFlow flow exporter, and enters Flexible NetFlow flow exporter configuration mode.

record

To add a flow record for a Flexible NetFlow flow monitor, use the **record** command in flow monitor configuration mode. To remove a flow record for a Flexible NetFlow flow monitor, use the **no** form of this command.

record *record-name*

no record

Syntax Description

record-name	Name of a user-defined flow record that was previously configured.

Command Default   A flow record is not configured.

Command Modes   Flow monitor configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines   Each flow monitor requires a record to define the contents and layout of its cache entries. The flow monitor can use one of the wide range of predefined record formats, or advanced users may create their own record formats.

Note   You must use the **no ip flow monitor** command to remove a flow monitor from all of the interfaces to which you have applied it before you can modify the parameters for the **record** command for the flow monitor.

Examples   The following example configures the flow monitor to use FLOW-RECORD-1:

```
Switch(config)# flow monitor FLOW-MONITOR-1
Switch(config-flow-monitor)# record FLOW-RECORD-1
```

Related Commands

Command	Description
flow monitor	Creates a flow monitor, or modifies an existing flow monitor, and enters flow monitor configuration mode.

sampler

To create a Flexible NetFlow flow sampler, or to modify an existing Flexible NetFlow flow sampler, and to enter Flexible NetFlow sampler configuration mode, use the **sampler** command in global configuration mode. To remove a sampler, use the **no** form of this command.

sampler *sampler-name*

no sampler *sampler-name*

Syntax Description

sampler-name	Name of the flow sampler that is being created or modified.

Command Default   Flexible NetFlow flow samplers are not configured.

Command Modes   Global configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines   Flow samplers are used to reduce the load placed by Flexible NetFlow on the networking device to monitor traffic by limiting the number of packets that are analyzed. You configure a rate of sampling that is 1 out of a range of 2-1024 packets. Flow samplers are applied to interfaces in conjunction with a flow monitor to implement sampled Flexible NetFlow.

To enable flow sampling, you configure the record that you want to use for traffic analysis and assign it to a flow monitor. When you apply a flow monitor with a sampler to an interface, the sampled packets are analyzed at the rate specified by the sampler and compared with the flow record associated with the flow monitor. If the analyzed packets meet the criteria specified by the flow record, they are added to the flow monitor cache.

Examples   The following example creates a flow sampler name SAMPLER-1:

```
Switch(config)# sampler SAMPLER-1
Switch(config-sampler)#
```

Related Commands

Command	Description
debug sampler	Enables debugging output for Flexible NetFlow samplers.
mode	Specifies the type of sampling and the packet interval for a Flexible NetFlow sampler.

Command	Description
show sampler	Displays the status and statistics for a Flexible NetFlow sampler.

show flow exporter

To display flow exporter status and statistics, use the **show flow exporter** command in privileged EXEC mode.

show flow exporter [**broker** [**detail**| **picture**]| **export-ids netflow-v9**| [**name**] *exporter-name* [**statistics**| **templates**]| **option application** {**engines**| **table**}| **statistics**| **templates**]

Syntax Description

broker	(Optional) Displays information about the state of the broker for the Flexible NetFlow flow exporter.
detail	(Optional) Displays detailed information about the flow exporter broker.
picture	(Optional) Displays a picture of the broker state.
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.
option application engines	(Optional) Displays the application engines option for flow exporters.
option application table	(Optional) Displays the application table option for flow exporters. This option is specific to the AVC feature. For more information, see the *System Management Configuration Guide, Cisco IOS XE Release 3SE*.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Examples   The following example displays the status and statistics for all of the flow exporters configured on a switch:

```
Switch# 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 4: show flow exporter Field Descriptions

Field	Description
Flow Exporter	The name of the flow exporter that you configured.
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 switch:

```
Switch# 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)
```

Related Commands

Command	Description
clear flow exporter	Clears the statistics for a Flexible NetFlow flow exporter.
debug flow exporter	Enables debugging output for Flexible NetFlow flow exporters.
flow exporter	Creates a Flexible NetFlow flow exporter, or modifies an existing Flexible NetFlow flow exporter, and enters Flexible NetFlow flow exporter configuration mode.

show flow interface

To display the Flexible NetFlow 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 Flexible NetFlow accounting configuration information.
number	(Optional) The number of the interface on which you want to display Flexible NetFlow accounting configuration information.

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Examples

The following example displays the Flexible NetFlow accounting configuration on Ethernet interfaces 0/0 and 0/1:

```
Switch# show flow interface gigabitethernet1/0/1

Interface Ethernet1/0
        monitor:          FLOW-MONITOR-1
        direction:        Output
        traffic(ip):      on
Switch# 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 5: 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.

show flow interface

Field	Description
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.
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).

Related Commands

Command	Description
show flow monitor	Displays the status and statistics for a Flexible NetFlow flow monitor.

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show flow monitor

To display the status and statistics for a Flexible NetFlow flow monitor, use the **show flow monitor** command in privileged EXEC mode.

show flow monitor [**broker** [**detail**| **picture**]| [**name**] *monitor-name* [**cache** [**format** {**csv**| **record**| **table**}]]| **provisioning**| **statistics**]

Syntax Description

broker	(Optional) Displays information about the state of the broker for the flow monitor
detail	(Optional) Displays detailed information about the flow monitor broker.
picture	(Optional) Displays a picture of the broker state.
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.
provisioning	(Optional) Displays the flow monitor provisioning information.
statistics	(Optional) Displays the statistics for the flow monitor.

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE 3.3SE	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 Flexible NetFlow 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 Flexible NetFlow collects values as additional data for the cache.

Examples

The following example displays the status for a flow monitor:

```
Switch# 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 6: 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.

Field	Description
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:

```
Switch# show flow monitor FLOW-MONITOR-1 cache
  Cache type:                          Normal (Platform cache)
  Cache size:                          Unknown
  Current entries:                          1

  Flows added:                              3
  Flows aged:                               2
    - Active timeout      (   300 secs)     2

DATALINK MAC SOURCE ADDRESS INPUT:       0000.0000.1000
DATALINK MAC DESTINATION ADDRESS INPUT:  6400.F125.59E6
IPV6 SOURCE ADDRESS:                     2001:DB8::1
IPV6 DESTINATION ADDRESS:                2001:DB8:1::1
TRNS SOURCE PORT:                        1111
TRNS DESTINATION PORT:                   2222
IP VERSION:                              6
IP PROTOCOL:                             6
IP TOS:                                  0x05
IP TTL:                                  11
tcp flags:                               0x20
counter bytes long:                      132059538
counter packets long:                    1158417
```

This table describes the significant fields shown in the display.

Table 7: show flow monitor monitor-name cache Field Descriptions

Field	Description
Cache type	Flow monitor cache type. The value is always normal, as it is the only supported cache type.
Cache Size	Number of entries in the cache.
Current entries	Number of entries in the cache that are in use.
Flows added	Flows added to the cache since the cache was created.
Flows aged	Flows expired from the cache since the cache was created.
Active timeout	Current value for the active timeout in seconds.
Inactive timeout	Current value for the inactive timeout in seconds.
DATALINK MAC SOURCE ADDRESS INPUT	MAC source address of input packets.
DATALINK MAC DESTINATION ADDRESS INPUT	MAC destination address of input packets.
IPV6 SOURCE ADDRESS	IPv6 source address.

Field	Description
IPV6 DESTINATION ADDRESS	IPv6 destination address.
TRNS SOURCE PORT	Source port for the transport protocol.
TRNS DESTINATION PORT	Destination port for the transport protocol.
IP VERSION	IP version.
IP PROTOCOL	Protocol number.
IP TOS	IP type of service (ToS) value.
IP TTL	IP time-to-live (TTL) value.
tcp flags	Value of the TCP flags.
counter bytes	Number of bytes that have been counted.
counter packets	Number of packets that have been counted.

The following example displays the status, statistics, and data for the flow monitor named FLOW-MONITOR-1 in a table format:

```
Switch# show flow monitor FLOW-MONITOR-1 cache format table
  Cache type:                       Normal (Platform cache)
  Cache size:                       Unknown
  Current entries:                      1

  Flows added:                          3
  Flows aged:                           2
    - Active timeout      (   300 secs)    2

DATALINK MAC SRC ADDR INPUT  DATALINK MAC DST ADDR INPUT  IPV6 SRC ADDR   IPV6 DST ADDR
TRNS SRC PORT  TRNS DST PORT  IP VERSION  IP PROT  IP TOS  IP TTL  tcp flags  bytes long
pkts long
==========================  ===========================  =============  =============
=============  =============  ==========  =======  ======  ======  =========  ==========
=========
0000.0000.1000               6400.F125.59E6                2001:DB8::1    2001:DB8:1::1
    1111          2222           6        6  0x05      11  0x20        132059538
1158417
```

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:

```
Switch# show flow monitor name FLOW-MONITOR-IPv6 cache format record
  Cache type:                       Normal (Platform cache)
  Cache size:                       Unknown
  Current entries:                      1

  Flows added:                          3
  Flows aged:                           2
    - Active timeout      (   300 secs)    2

DATALINK MAC SOURCE ADDRESS INPUT:       0000.0000.1000
DATALINK MAC DESTINATION ADDRESS INPUT:  6400.F125.59E6
IPV6 SOURCE ADDRESS:                     2001::2
IPV6 DESTINATION ADDRESS:                2002::2
```

```
TRNS SOURCE PORT:                          1111
TRNS DESTINATION PORT:                     2222
IP VERSION:                                6
IP PROTOCOL:                               6
IP TOS:                                    0x05
IP TTL:                                    11
tcp flags:                                 0x20
counter bytes long:                        132059538
counter packets long:                      1158417
```

The following example displays the status and statistics for a flow monitor:

```
Switch# show flow monitor FLOW-MONITOR-1 statistics
  Cache type:                              Normal (Platform cache)
  Cache size:                              Unknown
  Current entries:                               1

  Flows added:                                   3
  Flows aged:                                    2
    - Active timeout      (   300 secs)         2
```

Related Commands

Command	Description
clear flow monitor	Clears a flow monitor cache or flow monitor statistics and forces the export of the data in the flow monitor cache.
debug flow monitor	Enables debugging output for Flexible NetFlow flow monitors.

show flow record

To display the status and statistics for a Flexible NetFlow flow record, use the **show flow record** command in privileged EXEC mode.

show flow record [**broker** [**detail**| **picture**]| [**name**] *record-name*]

Syntax Description

broker	(Optional) Displays information about the state of the broker for the Flexible NetFlow flow record.
detail	(Optional) Displays detailed information about the flow record broker.
picture	(Optional) Displays a picture of the broker state.
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 3.3SE	This command was introduced.

Examples The following example displays the status and statistics for FLOW-RECORD-1:

```
Switch# 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
```

Related Commands

Command	Description
record	Configures a flow record for a Flexible NetFlow flow monitor.

show flow record wireless avc basic (wireless)

This command is specific to the AVC feature. To view default flow record information, use the **show flow record wireless avc basic** command in privileged EXEC mode.

show flow record wireless avc basic

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines

If a user-defined flow record has not been specified, then the default flow record **wireless avc basic** is mapped to the flow monitor.

This command is specific to the AVC feature. For more information, see the *System Management Configuration Guide, Cisco IOS XE Release 3SE*.

Examples

This command is specific to the AVC feature. For examples, see the *System Management Configuration Guide, Cisco IOS XE Release 3SE*.

show sampler

To display the status and statistics for a Flexible NetFlow sampler, use the **show sampler** command in privileged EXEC mode.

show sampler [**broker** [**detail**| **picture**]| [**name**] *sampler-name*]

Syntax Description

broker	(Optional) Displays information about the state of the broker for the Flexible NetFlow sampler.
detail	(Optional) Displays detailed information about the sampler broker.
picture	(Optional) Displays a picture of the broker state.
name	(Optional) Specifies the name of a sampler.
sampler-name	(Optional) Name of a sampler that was previously configured.

Command Default   None

Command Modes   Privileged EXEC

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Examples   The following example displays the status and statistics for all of the flow samplers configured:

```
Switch# show sampler
Sampler SAMPLER-1:
  ID:           2083940135
  export ID:    0
  Description:  User defined
  Type:         Invalid (not in use)
  Rate:         1 out of 32
  Samples:      0
  Requests:     0
  Users (0):

Sampler SAMPLER-2:
  ID:           3800923489
  export ID:    1
  Description:  User defined
  Type:         random
  Rate:         1 out of 100
  Samples:      1
  Requests:     124
  Users (1):
```

```
flow monitor FLOW-MONITOR-1 (datalink,vlan1)  0 out of 0
```

This table describes the significant fields shown in the display.

Table 8: show sampler Field Descriptions

Field	Description
ID	ID number of the flow sampler.
Export ID	ID of the flow sampler export.
Description	Description that you configured for the flow sampler, or the default description User defined.
Type	Sampling mode that you configured for the flow sampler.
Rate	Window size (for packet selection) that you configured for the flow sampler. The range is 2 to 32768.
Samples	Number of packets sampled since the flow sampler was configured or the switch was restarted. This is equivalent to the number of times a positive response was received when the sampler was queried to determine if the traffic needed to be sampled. See the explanation of the Requests field in this table.
Requests	Number of times the flow sampler was queried to determine if the traffic needed to be sampled.
Users	Interfaces on which the flow sampler is configured.

Related Commands

Command	Description
debug sampler	Enables debugging output for Flexible NetFlow samplers.
sampler	Creates a Flexible NetFlow flow sampler, or modifies an existing Flexible NetFlow flow sampler.

source

To configure the source IP address interface for all of the packets sent by a Flexible NetFlow flow exporter, use the **source** command in flow exporter configuration mode. To remove the source IP address interface for all of the packets sent by a Flexible NetFlow flow exporter, use the **no** form of this command.

source *interface-type interface-number*

no source

Syntax Description

interface-type	Type of interface whose IP address you want to use for the source IP address of the packets sent by a Flexible NetFlow flow exporter.
interface-number	Interface number whose IP address you want to use for the source IP address of the packets sent by a Flexible NetFlow flow exporter.

Command Default

The IP address of the interface over which the Flexible NetFlow datagram is transmitted is used as the source IP address.

Command Modes

Flow exporter configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines

The benefits of using a consistent IP source address for the datagrams that Flexible NetFlow sends include the following:

- The source IP address of the datagrams exported by Flexible NetFlow is used by the destination system to determine from which switch the Flexible NetFlow data is arriving. If your network has two or more paths that can be used to send Flexible NetFlow datagrams from the switch to the destination system and you do not specify the source interface from which the source IP address is to be obtained, the switch uses the IP address of the interface over which the datagram is transmitted as the source IP address of the datagram. In this situation the destination system might receive Flexible NetFlow datagrams from the same switch, but with different source IP addresses. When the destination system receives Flexible NetFlow datagrams from the same switch with different source IP addresses, the destination system treats the Flexible NetFlow datagrams as if they were being sent from different switches. To avoid having the destination system treat the Flexible NetFlow datagrams as if they were being sent from different switches, you must configure the destination system to aggregate the Flexible NetFlow datagrams it receives from all of the possible source IP addresses in the switch into a single Flexible NetFlow flow.

- If your switch has multiple interfaces that can be used to transmit datagrams to the destination system, and you do not configure the **source** command, you will have to add an entry for the IP address of each

interface into any access lists that you create for permitting Flexible NetFlow traffic. Creating and maintaining access lists for permitting Flexible NetFlow traffic from known sources and blocking it from unknown sources is easier when you limit the source IP address for Flexible NetFlow datagrams to a single IP address for each switch that is exporting Flexible NetFlow traffic.

Caution The interface that you configure as the **source** interface must have an IP address configured, and it must be up.

Tip When a transient outage occurs on the interface that you configured with the **source** command, the Flexible NetFlow exporter reverts to the default behavior of using the IP address of the interface over which the datagrams are being transmitted as the source IP address for the datagrams. To avoid this problem, use a loopback interface as the source interface because loopback interfaces are not subject to the transient outages that can occur on physical interfaces.

To return this command to its default settings, use the **no source** or **default source** flow exporter configuration command.

Examples The following example shows how to configure Flexible NetFlow to use a loopback interface as the source interface for NetFlow traffic:

```
Switch(config)# flow exporter FLOW-EXPORTER-1
Switch(config-flow-exporter)# source loopback 0
```

Related Commands

Command	Description
flow exporter	Creates a Flexible NetFlow flow exporter, or modifies an existing Flexible NetFlow flow exporter, and enters Flexible NetFlow flow exporter configuration mode.

template data timeout

To specify a timeout period for resending flow exporter template data, use the **template data timeout** command in flow exporter configuration mode. To remove the template resend timeout for a flow exporter, use the **no** form of this command.

template data timeout *seconds*

no template data timeout *seconds*

Syntax Description

seconds	Timeout value in seconds. The range is 1 to 86400. The default is 600.

Command Default   The default template resend timeout for a flow exporter is 600 seconds.

Command Modes   Flow exporter configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines   Flow exporter template data describes the exported data records. Data records cannot be decoded without the corresponding template. The **template data timeout** command controls how often those templates are exported.

To return this command to its default settings, use the **no template data timeout** or **default template data timeout** flow record exporter command.

Examples   The following example configures resending templates based on a timeout of 1000 seconds:

```
Switch(config)# flow exporter FLOW-EXPORTER-1
Switch(config-flow-exporter)# template data timeout 1000
```

Related Commands

Command	Description
flow exporter	Creates a Flexible NetFlow flow exporter, or modifies an existing Flexible NetFlow flow exporter, and enters Flexible NetFlow flow exporter configuration mode.

transport

To configure the transport protocol for a flow exporter for Flexible NetFlow, use the **transport** command in flow exporter configuration mode. To remove the transport protocol for a flow exporter, use the **no** form of this command.

transport udp *udp-port*

no transport udp *udp-port*

Syntax Description

udp *udp-port*	Specifies User Datagram Protocol (UDP) as the transport protocol and the UDP port number.

Command Default   Flow exporters use UDP on port 9995.

Command Modes   Flow exporter configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines   To return this command to its default settings, use the **no transport** or **default transport flow exporter** configuration command.

Examples   The following example configures UDP as the transport protocol and a UDP port number of 250:

```
Switch(config)# flow exporter FLOW-EXPORTER-1
Switch(config-flow-exporter)# transport udp 250
```

Related Commands

Command	Description
flow exporter	Creates a Flexible NetFlow flow exporter, or modifies an existing Flexible NetFlow flow exporter, and enters Flexible NetFlow flow exporter configuration mode.

ttl

To configure the time-to-live (TTL) value, use the **ttl** command in flow exporter configuration mode. To remove the TTL value, use the **no** form of this command.

ttl *ttl*

no ttl *ttl*

Syntax Description

ttl	Time-to-live (TTL) value for exported datagrams. The range is 1 to 255. The default is 255.

Command Default   Flow exporters use a TTL of 255.

Command Modes   Flow exporter configuration

Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

Usage Guidelines   To return this command to its default settings, use the **no ttl** or **default ttl** flow exporter configuration command.

Examples   The following example specifies a TTL of 15:

```
Switch(config)# flow exporter FLOW-EXPORTER-1
Switch(config-flow-exporter)# ttl 15
```

Related Commands

Command	Description
flow exporter	Creates a Flexible NetFlow flow exporter, or modifies an existing Flexible NetFlow flow exporter, and enters Flexible NetFlow flow exporter configuration mode.

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