Network Management Commands

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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** | **update**} *seconds* | **type** **normal**}
no **cache** {**timeout** {**active** | **inactive** | **update**} | **type**}

Syntax Description

timeout	Specifies the flow timeout.
active	Specifies the active flow timeout.
inactive	Specifies the inactive flow timeout.
update	Specifies the update timeout for a permanent flow cache.
seconds	The timeout value in seconds. The range is 30 to 604800 (7 days) for a normal flow cache. For a permanent flow cache 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

Command Modes

Flow monitor configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	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 timeout update** command controls the periodic updates sent by the permanent type of cache. This behavior is similar to the active timeout, except that it does not result in the removal of the cache entry from the cache. By default, this timer value is 1800 seconds (30 minutes).

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.

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

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

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

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

The following example shows how to configure the permanent cache update timeout:

```
Device(config)# flow monitor FLOW-MONITOR-1
Device(config-flow-monitor)# cache timeout update 5000
```

The following example shows how to configure a normal cache:

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

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 Fuji 16.9.2	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 device:

```
Device# clear flow exporter statistics
```

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

```
Device# clear flow exporter FLOW-EXPORTER-1 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 Fuji 16.9.2	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:

```
Device# 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:

```
Device# 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:

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

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

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

clear snmp stats hosts

To clear the NMS IP address, the number of times an NMS polls the agent, and the timestamp of polling, use the **clear snmp stats hosts** command in privileged EXEC mode.

clear snmp stats hosts

Syntax Description

This command has no arguments or keywords.

Command Default

The details of the SNMP managers polled to the SNMP agent is stored in the system.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1	This command was introduced.

Usage Guidelines

Use the **clear snmp stats hosts** command to delete all the entries polled to the SNMP agent.

The following is sample output of the **clear snmp stats hosts** command.

```
Device# clear snmp stats hosts
Request Count                  Last Timestamp             Address
```

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**}

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*.
interface	Configures the input and output interface name as a non-key field for a flow record. For more information, see *collect interface*.
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*.
transport	Enables the collecting of transport TCP flags from a flow record. For more information, see *collect transport tcp flags*.

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 Fuji 16.9.2	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.

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

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

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 Fuji 16.9.2	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.

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

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

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

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

collect flow sampler

To configure a flow sampler ID as a non-key field for the record, use the **collect flow sampler** command in flow record configuration mode. To disable the use of the flow sampler ID number as a non-key field for a flow record, use the **no** form of this command.

collect flow sampler
no collect flow sampler

Syntax Description

This command has no arguments or keywords.

Command Default

The flow sampler is not configured as non-key fields.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	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.

The **collect flow sampler** command is useful when more than one flow sampler is being used with different sampling rates. The non-key field contains the ID of the flow sampler used to monitor the flow.

Examples

The following example shows how to configure the ID of the flow sampler that is assigned to the flow as a non-key field:

```
Device> enable
Device# confgure terminal
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# collect flow sampler
```

Related Commands

Command	Description
flow exporter	Creates a flow exporter
flow record	Creates a flow record for Flexible NetFlow.

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 Fuji 16.9.2	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.

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

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

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

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

collect ipv4 destination

To configure the IPv4 destination as a non-key field for a flow record, use the **collect ipv4 destination** command in flow record configuration mode. To disable the use of an IPv4 destination field as a non-key field for a flow record, use the **no** form of this command.

collect ipv4 destination {**mask** | **prefix**} [**minimum-mask** *mask*]
no collect ipv4 destination {**mask** | **prefix**} [**minimum-mask** *mask*]

Syntax Description

mask	Configures the IPv4 destination mask as a non-key field and enables collecting the value of the IPv4 destination mask from the flows.
prefix	Configures the prefix for the IPv4 destination as a non-key field and enables collecting the value of the IPv4 destination prefix from the flows.
minimum-mask *mask*	(Optional) Specifies the size, in bits, of the minimum mask. Range: 1 to 32.

Command Default

The IPv4 destination is not configured as a non-key field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.

Usage Guidelines

The Flexible NetFlow **collect** commands are used to configure non-key fields for the flow monitor record and to enable capturing the values in the fields for the flow created with the record. The values in non-key fields are added to flows to provide additional information about the traffic in the flows. A change in the value of a non-key field does not create a new flow. In most cases the values for non-key fields are taken from only the first packet in the flow.

Examples

The following example shows how to configure the IPv4 destination prefix from the flows that have a prefix of 16 bits as a non-key field:

```
Device> enable
Device> configure terminal
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# collect ipv4 destination prefix minimum-mask 16
```

Related Commands

Command	Description
flow record	Creates a flow record for Flexible NetFlow.

collect ipv4 source

To configure the IPv4 source as a non-key field for a flow record, use the **collect ipv4 source** command in flow record configuration mode. To disable the use of the IPv4 source field as a non-key field for a flow record, use the **no** form of this command.

collect ipv4 source {**mask** | **prefix**} [**minimum-mask** *mask*]
no collect ipv4 source {**mask** | **prefix**} [**minimum-mask** *mask*]

Syntax Description

mask	Configures the mask for the IPv4 source as a non-key field and enables collecting the value of the IPv4 source mask from the flows.
prefix	Configures the prefix for the IPv4 source as a non-key field and enables collecting the value of the IPv4 source prefix from the flows.
minimum-mask *mask*	(Optional) Specifies the size, in bits, of the minimum mask. Range: 1 to 32.

Command Default

The IPv4 source is not configured as a non-key field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	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.

collect ipv4 source prefix minimum-mask

The source prefix is the network part of an IPv4 source. The optional minimum mask allows more information to be gathered about large networks.

collect ipv4 source mask minimum-mask

The source mask is the number of bits that make up the network part of the source. The optional minimum mask allows a minimum value to be configured. This command is useful when there is a minimum mask configured for the source prefix field and the mask is to be used with the prefix. In this case, the values configured for the minimum mask should be the same for the prefix and mask fields.

Alternatively, if the collector is aware of the minimum mask configuration of the prefix field, the mask field can be configured without a minimum mask so that the true mask and prefix can be calculated.

Examples

The following example shows how to configure the IPv4 source prefix from flows that have a prefix of 16 bits as a non-key field:

```
Device> enable
Device# conigure terminal
Device(config)# flow record FLOW-RECORD-1
```

```
Device(config-flow-record)# collect ipv4 source prefix minimum-mask 16
```

Related Commands

Command	Description
flow record	Creates a flow record for Flexible NetFlow.

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 Fuji 16.9.2	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.

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

```
Device(config)# flow record FLOW-RECORD-1
Device(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:

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

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 Fuji 16.9.2	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.

The following example collects the TCP flags from a flow:

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

collect routing next-hop address

To configure the next-hop address value as a non-key field and enable collecting information regarding the next hop from the flows, use the **collect routing next-hop address** command in flow record configuration mode. To disable the use of one or more of the routing attributes as a non-key field for a flow record, use the **no** form of this command.

collect routing next-hop address ipv4
no collect routing next-hop address ipv4

Syntax Description

ipv4	Specifies that the next-hop address value is an IPv4 address.

Command Default

Next hop address value is not configured as a non-key field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	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 shows how to configure the next-hop address value as a non-key field:

```
Device> enable
Device# configure terminal
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# collect routing next-hop address ipv4
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.

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 Fuji 16.9.2	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.

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

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

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 Fuji 16.9.2	This command was introduced.

Examples

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

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

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 Fuji 16.9.2	This command was introduced.

Examples

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

```
Device# debug flow monitor FLOW-MONITOR-1 cache
May 21 21:53:02.839: FLOW MON:  'FLOW-MONITOR-1' deleted 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 Fuji 16.9.2	This command was introduced.

Examples

The following example enables debugging for the flow record:

```
Device# 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 Fuji 16.9.2	This command was introduced.

Examples

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

```
Device# 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 Fuji 16.9.2	This command was introduced.

Usage Guidelines

To return this command to its default setting, use the **no description** or **default description** command in the appropriate configuration mode.

The following example configures a description for a flow monitor:

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

destination

To configure an export destination for a flow exporter, use the **destination** command in flow exporter configuration mode. To remove an export destination for a flow exporter, use the **no** form of this command.

destination {*hostnameip-address*} **vrf** *vrf-label*
no destination {*hostnameip-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 Fuji 16.9.2	This command was introduced.

Usage Guidelines

Each flow exporter can have only one destination address or hostname.

When you configure a hostname instead of the IP address for the device, the hostname is resolved immediately and the IPv4 address is stored in the running configuration. If the hostname-to-IP-address mapping that was used for the original Domain Name System (DNS) name resolution changes dynamically on the DNS server, the device does not detect this, and the exported data continues to be sent to the original IP address, resulting in a loss of data.

To return this command to its default setting, use the **no destination** or **default destination** command in flow exporter configuration mode.

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

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

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:

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

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 Fuji 16.9.2	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.

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

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

event manager applet

To register an applet with the Embedded Event Manager (EEM) and to enter applet configuration mode, use the **event manager applet** command in global configuration mode. To unregister the applet, use the **no** form of this command.

event manager applet *applet-name* [**authorization bypass**] [**class** *class-options*] [**trap**]
no event manager applet *applet-name* [**authorization bypass**] [**class** *class-options*] [**trap**]

Syntax Description

applet-name	Name of the applet file.
authorization	(Optional) Specifies AAA authorization type for applet.
bypass	(Optional) Specifies EEM AAA authorization type bypass.
class	(Optional) Specifies the EEM policy class.
class-options	(Optional) The EEM policy class. You can specify either one of the following: • *class-letter*-- Letter from A to Z that identifies each policy class. You can specify any one *class-letter*. • **default** --Specifies the policies registered with the default class.
trap	(Optional) Generates a Simple Network Management Protocol (SNMP) trap when the policy is triggered.

Command Default

No EEM applets are registered.

Command Modes

Global configuration (config)

Command History

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

An EEM applet is a concise method for defining event screening criteria and the actions to be taken when that event occurs.

Only one event configuration command is allowed within an applet configuration. When applet configuration submode is exited and no event command is present, a warning is displayed stating that no event is associated with this applet. If no event is specified, this applet is not considered registered and the applet is not displayed. When no action is associated with this applet, events are still triggered but no actions are performed. Multiple action applet configuration commands are allowed within an applet configuration. Use the **show event manager policy registered** command to display a list of registered applets.

Before modifying an EEM applet, use the **no** form of this command to unregister the applet because the existing applet is not replaced until you exit applet configuration mode. While you are in applet configuration mode modifying the applet, the existing applet may be executing. When you exit applet configuration mode, the old applet is unregistered and the new version is registered.

Note Do not attempt making any partial modification. EEM does not support partial changes to already registered policies. EEM policy has to be always unregistered before registering again with changes.

Action configuration commands are uniquely identified using the *label* argument, which can be any string value. Actions are sorted in ascending alphanumeric key sequence using the *label* argument as the sort key and are run using this sequence.

The EEM schedules and runs policies on the basis of an event specification that is contained within the policy itself. When applet configuration mode is exited, EEM examines the event and action commands that are entered and registers the applet to be run when a specified event occurs.

The EEM policies will be assigned a class when **class** *class-letter* is specified when they are registered. EEM policies registered without a class will be assigned to the **default** class. Threads that have **default** as the class will service the default class when the thread is available for work. Threads that are assigned specific class letters will service any policy with a matching class letter when the thread is available for work.

If there is no EEM execution thread available to run the policy in the specified class and a scheduler rule for the class is configured, the policy will wait until a thread of that class is available for execution. Synchronous policies that are triggered from the same input event should be scheduled in the same execution thread. Policies will be queued in a separate queue for each class using the queue_priority as the queuing order.

When a policy is triggered and if AAA is configured it will contact the AAA server for authorization. Using the **authorization bypass** keyword combination, you can skip to contact the AAA server and run the policy immediately. EEM stores AAA bypassed policy names in a list. This list is checked when policies are triggered. If a match is found, AAA authorization is bypassed.

To avoid authorization for commands configured through the EEM policy, EEM will use named method lists, which AAA provides. These named method lists can be configured to have no command authorization.

The following is a sample AAA configuration.

This configuration assumes a TACACS+ server at 192.168.10.1 port 10000. If the TACACS+ server is not enabled, configuration commands are permitted on the console; however, EEM policy and applet CLI interactions will fail.

```
enable password lab
aaa new-model
tacacs-server host 128.107.164.152 port 10000
tacacs-server key cisco
aaa authentication login consoleline none
aaa authorization exec consoleline none
aaa authorization commands 1 consoleline none
aaa authorization commands 15 consoleline none
line con 0
 exec-timeout 0 0
 login authentication consoleline
aaa authentication login default group tacacs+ enable
aaa authorization exec default group tacacs+
aaa authorization commands 1 default group tacacs+
aaa authorization commands 15 default group tacacs+
```

The **authorization**, **class** and **trap** keywords can be used in any combination.

Examples

The following example shows an EEM applet called IPSLAping1 being registered to run when there is an exact match on the value of a specified SNMP object ID that represents a successful IP SLA

ICMP echo operation (this is equivalent to a **ping** command). Four actions are triggered when the echo operation fails, and event monitoring is disabled until after the second failure. A message that the ICMP echo operation to a server failed is sent to syslog, an SNMP trap is generated, EEM publishes an application-specific event, and a counter called IPSLA1F is incremented by a value of one.

```
Router(config)# event manager applet IPSLAping1
Router(config-applet)# event snmp oid 1.3.6.1.4.1.9.9.42.1.2.9.1.6.4 get-type exact
entry-op eq entry-val 1 exit-op eq exit-val 2 poll-interval 5
Router(config-applet)# action 1.0 syslog priority critical msg "Server IP echo failed:
OID=$_snmp_oid_val"
Router(config-applet)# action 1.1 snmp-trap strdata "EEM detected server reachability
failure to 10.1.88.9"
Router(config-applet)# action 1.2 publish-event sub-system 88000101 type 1 arg1 10.1.88.9
arg2 IPSLAEcho arg3 fail
Router(config-applet)# action 1.3 counter name _IPSLA1F value 1 op inc
```

The following example shows how to register an applet with the name one and class A and enter applet configuration mode where the timer event detector is set to trigger an event every 10 seconds. When the event is triggered, the **action syslog** command writes the message “hello world” to syslog.

```
Router(config)# event manager applet one class A
Router(config-applet)# event timer watchdog time 10
Router(config-applet)# action syslog syslog msg "hello world"
Router(config-applet)# exit
```

The following example shows how to bypass the AAA authorization when registering an applet with the name one and class A.

```
Router(config)# event manager applet one class A authorization bypass
Router(config-applet)#
```

Related Commands

Command	Description
show event manager policy registered	Displays registered EEM policies.

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 Fuji 16.9.2	This command was introduced.

Usage Guidelines

The device does not support NetFlow v5 export format, only NetFlow v9 export format is supported.

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

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

export-protocol netflow-v5

To configure NetFlow Version 5 export as the export protocol for a Flexible NetFlow exporter, use the **export-protocol netflow-v5** command in flow exporter configuration mode.

export-protocol netflow-v5

Syntax Description

This command has no arguments or keywords.

Command Default

NetFlow Version 5 is enabled.

Command Modes

Flow exporter configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

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 Fuji 16.9.2	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:

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

fconfigure

To specify the options in a channel use the **fconfigure** command in the TCL configuration mode.

fconfigure *channel-name* **remote** [*host port*] **broadcast** *boolean* **vrf** *vrf-table-name*

Syntax Description

remote	Configures a remote session. It supports both IPv4 and IPv6 addresses.
broadcast	Enables or disables broadcasting. The value of the option must be a proper boolean value.
vrf	Returns the local VRF table name for the specified socket. If no VRF Table has been configured for the given socket, TCL_ERROR will be returned and “No VRF table configured” will be appended to the interpreter result.

Command Default

Command Modes

TCL configuration mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	The **myvrf** keyword was introduced.

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 Fuji 16.9.2	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:

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

flow monitor

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

flow monitor *monitor-name*
no flow monitor *monitor-name*

Syntax Description

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

Command Default

Flexible NetFlow flow monitors are not present in the configuration.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	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:

```
Device(config)# flow monitor FLOW-MONITOR-1
Device(config-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 Fuji 16.9.2	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 device 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:

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

ip wccp

To enable the web cache service, and specify the service number that corresponds to a dynamic service that is defined by the application engine, use the **ip wccp** global configuration command on the device. Use the **no** form of this command to disable the service.

ip wccp {**web-cache** | *service-number*} [**group-address** *groupaddress*] [**group-list** *access-list*] [**redirect-list** *access-list*] [**password** *encryption-number password*]
no ip wccp {**web-cache** | *service-number*} [**group-address** *groupaddress*] [**group-list** *access-list*] [**redirect-list** *access-list*] [**password** *encryption-number password*]

Syntax Description

web-cache	Specifies the web-cache service (WCCP Version 1 and Version 2).
service-number	Dynamic service identifier, which means the service definition is dictated by the cache. The dynamic service number can be from 0 to 254. The maximum number of services is 256, which includes the web-cache service specified with the **web-cache** keyword.
group-address *groupaddress*	(Optional) Specifies the multicast group address used by the device and the application engines to participate in the service group.
group-list *access-list*	(Optional) If a multicast group address is not used, specifies a list of valid IP addresses that correspond to the application engines that are participating in the service group.
redirect-list *access-list*	(Optional) Specifies the redirect service for specific hosts or specific packets from hosts.
password *encryption-number password*	(Optional) Specifies an encryption number. The range is 0 to 7. Use 0 for not encrypted, and use 7 for proprietary. Also, specifies a password name up to seven characters in length. The device combines the password with the MD5 authentication value to create security for the connection between the device and the application engine. By default, no password is configured, and no authentication is performed.

Command Default

WCCP services are not enabled on the device.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

WCCP transparent caching bypasses Network Address Translation (NAT) when Cisco Express Forwarding switching is enabled. To work around this situation, configure WCCP transparent caching in the outgoing direction, enable Cisco Express Forwarding switching on the content engine interface, and specify the **ip wccp web-cache redirect out** command. Configure WCCP in the incoming direction on the inside interface by

specifying the **ip wccp redirect exclude in** command on the router interface facing the cache. This configuration prevents the redirection of any packets arriving on that interface.

You can also include a redirect list when configuring a service group. The specified redirect list will deny packets with a NAT (source) IP address and prevent redirection.

This command instructs a device to enable or disable support for the specified service number or the web-cache service name. A service number can be from 0 to 254. Once the service number or name is enabled, the router can participate in the establishment of a service group.

When the **no ip wccp** command is entered, the device terminates participation in the service group, deallocates space if none of the interfaces still have the service configured, and terminates the WCCP task if no other services are configured.

The keywords following the **web-cache** keyword and the *service-number* argument are optional and may be specified in any order, but only may be specified once.

Example

The following example configures a web cache, the interface connected to the application engine or the server, and the interface connected to the client:

```
Device(config)# ip wccp web-cache
Device(config)# interface gigabitethernet1/0/1
Device(config-if)# no switchport
Device(config-if)# ip address 172.20.10.30 255.255.255.0
Device(config-if)# no shutdown
Device(config-if)# exit
Device(config)# interface gigabitethernet1/0/2
Device(config-if)# no switchport
Device(config-if)#
*Dec  6 13:11:29.507: %LINK-3-UPDOWN: Interface GigabitEthernet1/0/3, changed state to down

Device(config-if)# ip address 175.20.20.10 255.255.255.0
Device(config-if)# no shutdown
Device(config-if)# ip wccp web-cache redirect in
Device(config-if)# ip wccp web-cache group-listen
Device(config-if)# exit
```

ip flow monitor

To enable a Flexible NetFlow flow monitor for IPv4 traffic that the device 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 device receives on the interface.
output	Monitors IPv4 traffic that the device transmits on the interface.

Command Default

A flow monitor is not enabled.

Command Modes

Interface configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	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.

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

```
Device(config)# interface gigabitethernet1/0/1
Device(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:

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

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

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

```
Device(config)# interface gigabitethernet1/0/1
Device(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:

```
Device(config)# interface gigabitethernet1/0/1
Device(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:

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

ipv6 flow monitor

To enable a flow monitor for IPv6 traffic that the device 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 device receives on the interface.
output	Monitors IPv6 traffic that the device transmits on the interface.

Command Default

A flow monitor is not enabled.

Command Modes

Interface configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	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.

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

```
Device(config)# interface gigabitethernet1/0/1
Device(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:

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

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

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

```
Device(config)# interface gigabitethernet1/0/1
Device(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:

```
Device(config)# interface gigabitethernet1/0/1
Device(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:

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

ipv6 deny echo reply

To disable the generation of ICMP IPv6 echo reply message to an IPv6 multicast address or anycast address, use the **ipv6 deny-echo-reply** command in the global configuration mode. To enable the generation of ICMP IPv6 echo reply message, use the **no** form of the command.

ipv6 deny-echo-reply
no ipv6 deny-echo-reply

Command Default

ICMPv6 Echo Reply messages are sent from the device.

Command Modes

Global configuration (config)

Command History

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

Usage Guidelines

The **ipv6 deny-echo-reply** command works only for an IPv6 multicast or anycast address. It does not suppress an echo reply message for an IPv6 unicast address.

The following example shows how to configure a device to stop sending a response to an ICMPv6 echo message:

```
Device# configure terminal
Device(config)#ipv6 deny-echo-reply
Router(config)#end
```

The following example shows how to remove the **ipv6 deny-echo-reply** configuration:

```
Device# configure terminal
Device(config)#no ipv6 deny-echo-reply
Router(config)#end
```

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 Fuji 16.9.2	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.

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

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

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 device as a key field.
output	Configures the VLAN ID of traffic being transmitted by the device 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 Fuji 16.9.2	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.

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

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

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 Fuji 16.9.2	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.

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

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

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 Fuji 16.9.2	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.

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

```
Device(config)# flow record FLOW-RECORD-1
Device(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 device as a key field for a flow record:

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

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 device as a key field.
output	Configures the VLAN ID of traffic being transmitted by the device 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 Fuji 16.9.2	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.

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

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

match flow cts

To configure CTS source group tag and destination group tag for a flow record, use the**match flow cts** command in flow record configuration mode. To disable the group tag as key field for a flow record, use the **no** form of this command.

match flow cts {**source** | **destination**} **group-tag**
no match flow cts {**source** | **destination**} **group-tag**

Syntax Description

cts destination group-tag	Configures the CTS destination field group as a key field.
cts source group-tag	Configures the CTS source field group as a key field.

Command Default

The CTS destination or source field group, flow direction and the flow sampler ID are not configured as key fields.

Command Modes

Flexible NetFlow flow record configuration (config-flow-record)

Policy inline configuration (config-if-policy-inline)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	The command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

The following example configures the source group-tag as a key field:

```
Device(config)# flow record FLOW-RECORD-1
Device(config-flow-record)# match flow cts source group-tag
```

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 Fuji 16.9.2	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.

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

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

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 Fuji 16.9.2	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

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

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

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

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

match ipv4

To configure one or more of the IPv4 fields as a key field for a flow record, use the **match ipv4** command in flow record configuration mode. To disable the use of one or more of the IPv4 fields as a key field for a flow record, use the **no** form of this command.

match ipv4 {**destination address** | **protocol** | **source address** | **tos** | **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*.
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*.
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*.
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 Fuji 16.9.2	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

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

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

match ipv4 destination address

To configure the IPv4 destination address as a key field for a flow record, use the **match ipv4 destination address** command in flow record configuration mode. To disable the IPv4 destination address as a key field for a flow record, use the **no** form of this command.

match ipv4 destination address
no match ipv4 destination address

Syntax Description

This command has no arguments or keywords.

Command Default

The IPv4 destination address is not configured as a key field.

Command Modes

Flow record configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

To return this command to its default settings, use the **no match ipv4 destination address** or **default match ipv4 destination address** flow record configuration command.

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

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

match ipv4 source address

To configure the IPv4 source address as a key field for a flow record, use the **match ipv4 source address** command in flow record configuration mode. To disable the use of the IPv4 source address as a key field for a flow record, use the **no** form of this command.

match ipv4 source address
no match ipv4 source address

Syntax Description

This command has no arguments or keywords.

Command Default

The IPv4 source address is not configured as a key field.

Command Modes

Flow record configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

To return this command to its default settings, use the **no match ipv4 source address** or **default match ipv4 source address** flow record configuration command.

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

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

match ipv4 ttl

To configure the IPv4 time-to-live (TTL) field as a key field for a flow record, use the **match ipv4 ttl** command in flow record configuration mode. To disable the use of the IPv4 TTL field as a key field for a flow record, use the **no** form of this command.

match ipv4 ttl
no match ipv4 ttl

Syntax Description

This command has no arguments or keywords.

Command Default

The IPv4 time-to-live (TTL) field is not configured as a key field.

Command Modes

Flow record configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match ipv4 ttl** command.

The following example configures IPv4 TTL as a key field:

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

match ipv6

To configure one or more of the IPv6 fields as a key field for a flow record, use the **match ipv6** command in flow record configuration mode. To disable the use of one or more of the IPv6 fields as a key field for a flow record, use the **no** form of this command.

match ipv6 {**destination address** | **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*.
hop-limit	Configures the IPv6 hop limit as a key field. For more information see *match ipv6 hop limit*.
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*.
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 Fuji 16.9.2	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

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

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

match ipv6 destination address

To configure the IPv6 destination address as a key field for a flow record, use the **match ipv6 destination address** command in flow record configuration mode. To disable the IPv6 destination address as a key field for a flow record, use the **no** form of this command.

match ipv6 destination address
no match ipv6 destination address

Syntax Description

This command has no arguments or keywords.

Command Default

The IPv6 destination address is not configured as a key field.

Command Modes

Flow record configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

To return this command to its default settings, use the **no match ipv6 destination address** or **default match ipv6 destination address** flow record configuration command.

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

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

match ipv6 hop-limit

To configure the IPv6 hop limit as a key field for a flow record, use the **match ipv6 hop-limit** command in flow record configuration mode. To disable the use of a section of an IPv6 packet as a key field for a flow record, use the **no** form of this command.

match ipv6 hop-limit
no match ipv6 hop-limit

Syntax Description

This command has no arguments or keywords.

Command Default

The use of the IPv6 hop limit as a key field for a user-defined flow record is not enabled by default.

Command Modes

Flow record configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

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

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

match ipv6 source address

To configure the IPv6 source address as a key field for a flow record, use the **match ipv6 source address** command in flow record configuration mode. To disable the use of the IPv6 source address as a key field for a flow record, use the **no** form of this command.

match ipv6 source address
no match ipv6 source address

Syntax Description

This command has no arguments or keywords.

Command Default

The IPv6 source address is not configured as a key field.

Command Modes

Flow record configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

To return this command to its default settings, use the **no match ipv6 source address** or **default match ipv6 source address** flow record configuration command.

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

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

map platform-type

To set the parameter map attribute filter criteria to platform type, use the **map platform-type** command in parameter-map filter mode. To remove this criteria, use the **no** form of this command.

map-number **map platform-type** { {**eq** | **not-eq** | **regex**} *platform-type*}
no *map-number* **map platform-type** { {**eq** | **not-eq** | **regex**} *platform-type*}

Syntax Description

map-number	Parameter map number.
eq	Specifies that the filter type name is equal to the platform type name.
not-eq	Specifies that the filter type name is not equal to the platform type name.
regex	Specifies that the filter type name is a regular expression.
platform-type	Platform type for the parameter map attribute filter criteria.

Command Default

No default behavior or values.

Command Modes

Parameter-map filter (config-parameter-map-filter)

Command History

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

Examples

The following example shows how to set the parameter map attribute filter criteria to platform type:

```
Device> enable
Device# configure terminal
Device(config)# parameter-map type subscriber attribute-to-service Aironet-Policy-para
Device(config-parameter-map-filter)# 10 map platform-type eq C9xxx
```

Related Commands

Command	Description
parameter-map type subscriber attribute-to-service	Configures a subscriber parameter map and enters parameter-map filter 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 63.
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 64.
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 Fuji 16.9.2	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

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

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

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

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

match transport icmp ipv4

To configure the ICMP IPv4 type field and the code field as key fields for a flow record, use the **match transport icmp ipv4** command in flow record configuration mode. To disable the use of the ICMP IPv4 type field and code field as key fields for a flow record, use the **no** form of this command.

match transport icmp ipv4 {**code** | **type**}
no match transport icmp ipv4 {**code** | **type**}

Syntax Description

code	Configures the IPv4 ICMP code as a key field.
type	Configures the IPv4 ICMP type as a key field.

Command Default

The ICMP IPv4 type field and the code field are not configured as key fields.

Command Modes

Flow record configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

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

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

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

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

match transport icmp ipv6

To configure the ICMP IPv6 type field and the code field as key fields for a flow record, use the **match transport icmp ipv6** command in flow record configuration mode. To disable the use of the ICMP IPv6 type field and code field as key fields for a flow record, use the **no** form of this command.

match transport icmp ipv6 {**code** | **type**}
no match transport icmp ipv6 {**code** | **type**}

Syntax Description

code	Configures the IPv6 ICMP code as a key field.
type	Configures the IPv6 ICMP type as a key field.

Command Default

The ICMP IPv6 type field and the code field are not configured as key fields.

Command Modes

Flow record configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

A flow record requires at least one key field before it can be used in a flow monitor. The key fields distinguish flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

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

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

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

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

match platform-type

To evaluate control classes based on the platform type, use the **match platform-type** command in control class-map filter mode. To remove this condition, use the **no** form of this command.

match platform-type *platform-name*
no match platform-type *platform-name*

Syntax Description

platform-name	Name of the platform.

Command Default

No default behavior or values.

Command Modes

Control class-map filter (config-filter-control-classmap)

Command History

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

Examples

The following example shows how to set a class map filter to match a platform type:

```
Device> enable
Device# configure terminal
Device(config)# class-map type control subscriber match-all DOT1X_NO_AGENT
Device(config-filter-control-classmap)# match platform-type C9xxx
```

Related Commands

Command	Description
class-map type control subscriber	Creates a control class and enters control class-map filter 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 Fuji 16.9.2	This command was introduced.

Usage Guidelines

A total of four unique samplers are supported on the device. 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:

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

monitor capture (interface/control plane)

To configure monitor capture points specifying an attachment point and the packet flow direction or add more attachment points to a capture point, use the **monitor capture** command in privileged EXEC mode. To disable the monitor capture with the specified attachment point and the packet flow direction or disable one of multiple attachment points on a capture point, use the **no** form of this command.

monitor capture {*capture-name*} {**interface** *interface-type interface-id* | **control-plane**} {**in** | **out** | **both**}
no monitor capture {*capture-name*} {**interface** *interface-type interface-id* | **control-plane**} {**in** | **out** | **both**}

Syntax Description

capture-name	The name of the capture to be defined.
interface *interface-type interface-id*	Specifies an interface with *interface-type* and *interface-id* as an attachment point. The arguments have these meanings: • **GigabitEthernet** *interface-id*—A Gigabit Ethernet IEEE 802.3z interface. • **vlan** *vlan-id*—A VLAN. The range for *vlan-id* is 1 to 4095.
control-plane	Specifies the control plane as an attachment point.
in | **out** | **both**	Specifies the traffic direction to be captured.

Command Default

A Wireshark capture is not configured.

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Once an attachment point has been associated with a capture point using this command, the only way to change its direction is to remove the attachment point using the **no** form of the command and reattach the attachment point with the new direction. An attachment point's direction cannot be overridden.

If an attachment point is removed from a capture point and only one attachment point is associated with it, the capture point is effectively deleted.

Multiple attachment points can be associated with a capture point by re-running this command with another attachment point. An example is provided below.

Packets captured in the output direction of an interface might not reflect the changes made by switch rewrite (includes TTL, VLAN tag, CoS, checksum, MAC addresses, DSCP, precedent, UP, etc.).

No specific order applies when defining a capture point; you can define capture point parameters in any order. The Wireshark CLI allows as many parameters as possible on a single line. This limits the number of commands required to define a capture point.

Neither VRFs, management ports, nor private VLANs can be used as attachment points.

Wireshark cannot capture packets on a destination SPAN port.

When a VLAN is used as a Wireshark attachment point, packets are captured in the input direction only.

Examples

To define a capture point using a physical interface as an attachment point:

```
Device# monitor capture mycap interface GigabitEthernet1/0/1 in
Device# monitor capture mycap match ipv4 any any
```

Note The second command defines the core filter for the capture point. This is required for a functioning capture point.

To define a capture point with multiple attachment points:

```
Device# monitor capture mycap interface GigabitEthernet1/0/1 in
Device# monitor capture mycap match ipv4 any any
Device# monitor capture mycap control-plane in
Device# show monitor capture mycap parameter
   monitor capture mycap interface GigabitEthernet1/0/1 in
   monitor capture mycap control-plane in
```

To remove an attachment point from a capture point defined with multiple attachment points:

```
Device# show monitor capture mycap parameter
   monitor capture mycap interface GigabitEthernet1/0/1 in
   monitor capture mycap control-plane in
Device# no monitor capture mycap control-plane
Device# show monitor capture mycap parameter
   monitor capture mycap interface GigabitEthernet1/0/1 in
```

monitor capture buffer

To configure the buffer for monitor capture (WireShark), use the **monitor capture buffer** command in privileged EXEC mode. To disable the monitor capture buffer or change the buffer back to a default linear buffer from a circular buffer, use the **no** form of this command.

monitor capture {*capture-name*} **buffer** {**circular** [**size** *buffer-size*] | **size** *buffer-size*}
no monitor capture {*capture-name*} **buffer** [**circular**]

Syntax Description

capture-name	The name of the capture whose buffer is to be configured.
circular	Specifies that the buffer is of a circular type. The circular type of buffer continues to capture data, even after the buffer is consumed, by overwriting the data captured previously.
size *buffer-size*	(Optional) Specifies the size of the buffer. The range is from 1 MB to 100 MB.

Command Default

A linear buffer is configured.

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

When you first configure a WireShark capture, a circular buffer of a small size is suggested.

Example

To configure a circular buffer with a size of 1 MB:

```
Device# monitor capture mycap buffer circular size 1
```

monitor capture export

To export a monitor capture (WireShark) to a file, use the **monitor capture export** command in privileged EXEC mode.

monitor capture {*capture-name*} **export** *file-location* **:** *file-name*

Syntax Description

capture-name	The name of the capture to be exported.
file-location : *file-name*	(Optional) Specifies the location and file name of the capture storage file. Acceptable values for *file-location* : • flash—On-board flash storage • — USB drive

Command Default

The captured packets are not stored.

Command Modes

Privileged EXEC

Command History

Release	Modification
	This command was introduced.

Usage Guidelines

Use the **monitor capture export** command only when the storage destination is a capture buffer. The file may be stored either remotely or locally. Use this command either during capture or after the packet capture has stopped. The packet capture is stopped when one or more end conditions have been met or you entered the **monitor capture stop** command.

When WireShark is used on switches in a stack, packet captures can be stored only on the devices specified for *file-location* above that are connected to the active switch. Example: flash1 is connected to the active switch. flash2 is connected to the secondary switch. Only flash1 can be used to store packet captures.

Note Attempts to store packet captures on unsupported devices or devices not connected to the active switch will probably result in errors.

Example

To export the capture buffer contents to mycap.pcap on a flash drive:

monitor capture limit

To configure capture limits, use the **monitor capture limit** command in privileged EXEC mode. To remove the capture limits, use the **no** form of this command.

monitor capture {*capture-name*} **limit** {[**duration** *seconds*][**packet-length** *size*][**packets** *num*]}
no monitor capture {*capture-name*} **limit** [**duration**][**packet-length**][**packets**]

Syntax Description

capture-name	The name of the capture to be assigned capture limits.
duration *seconds*	(Optional) Specifies the duration of the capture, in seconds. The range is from 1 to 1000000.
packet-length *size*	(Optional) Specifies the packet length, in bytes. If the actual packet is longer than the specified length, only the first set of bytes whose number is denoted by the bytes argument is stored.
packets *num*	(Optional) Specifies the number of packets to be processed for capture.

Command Default

Capture limits are not configured.

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Example

To configure a session limit of 60 seconds and a packet segment length of 400 bytes:

```
Device# monitor capture mycap limit duration 60 packet-len 400
```

monitor capture start

To start the capture of packet data at a traffic trace point into a buffer, use the **monitor capture start** command in privileged EXEC mode.

monitor capture {*capture-name*} **start**

Syntax Description

capture-name	The name of the capture to be started.

Command Default

The buffer content is not cleared.

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Use the **monitor capture clear** command to enable the packet data capture after the capture point is defined. To stop the capture of packet data, use the **monitor capture stop** command.

Ensure that system resources such as CPU and memory are available before starting a capture.

Example

To start capturing buffer contents:

```
Device#  monitor capture mycap start
```

monitor capture stop

To stop the capture of packet data at a traffic trace point, use the **monitor capture stop** command in privileged EXEC mode.

monitor capture {*capture-name*} **stop**

Syntax Description

capture-name	The name of the capture to be stopped.

Command Default

The packet data capture is ongoing.

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Use the **monitor capture stop** command to stop the capture of packet data that you started using the **monitor capture start** command. You can configure two types of capture buffers: linear and circular. When the linear buffer is full, data capture stops automatically. When the circular buffer is full, data capture starts from the beginning and the data is overwritten.

Example

To stop capturing buffer contents:

```
Device#  monitor capture mycap stop
```

monitor session destination

To start a new Switched Port Analyzer (SPAN) session or Remote SPAN (RSPAN) destination session, to enable ingress traffic on the destination port for a network security device (such as a Cisco IDS Sensor Appliance), and to add or delete interfaces or VLANs to or from an existing SPAN or RSPAN session, use the **monitor session destination** global configuration command. To remove the SPAN or RSPAN session or to remove destination interfaces from the SPAN or RSPAN session, use the **no** form of this command.

monitor session *session-number* **destination** {**interface** *interface-id* [**,** | **-**] [**encapsulation** {**replicate** | **dot1q**}] {**ingress** [**dot1q** | **untagged**] } | {**remote**} **vlan** *vlan-id*
no monitor session *session-number* **destination** {**interface** *interface-id* [**,** | **-**] [**encapsulation** {**replicate** | **dot1q**}] {**ingress** [**dot1q** | **untagged**] } | {**remote**} **vlan** *vlan-id*

Syntax Description

session-number	
interface *interface-id*	Specifies the destination or source interface f physical ports (including type, stack member, channel is also a valid interface type, and the
,	(Optional) Specifies a series of interfaces or V from a previous range. Enter a space before a
-	(Optional) Specifies a range of interfaces or V
encapsulation replicate	(Optional) Specifies that the destination interfa If not selected, the default is to send packets i These keywords are valid only for local SPAN original VLAN ID; therefore, packets are alw ignored with the **no** form of the command.
encapsulation dot1q	(Optional) Specifies that the destination interf IEEE 802.1Q encapsulation. These keywords are valid only for local SPAN original VLAN ID; therefore, packets are alw ignored with the **no** form of the command.
ingress	Enables ingress traffic forwarding.
dot1q	(Optional) Accepts incoming packets with IE the default VLAN.
untagged	(Optional) Accepts incoming packets with un default VLAN.
isl	Specifies ingress forwarding using ISL encap
remote	Specifies the remote VLAN for an RSPAN so 1006 to 4094. The RSPAN VLAN cannot be VLAN 1 (the d for Token Ring and FDDI VLANs).

vlan *vlan-id*	Sets the default VLAN for ingress traffic

Command Default

No monitor sessions are configured.

If **encapsulation replicate** is not specified on a local SPAN destination port, packets are sent in native form with no encapsulation tag.

Ingress forwarding is disabled on destination ports.

You can specify **all**, **local**, **range** *session-range*, or **remote** with the **no monitor session** command to clear all SPAN and RSPAN, all local SPAN, a range, or all RSPAN sessions.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

A SPAN or RSPAN destination must be a physical port.

You can have a maximum of 64 destination ports on a switch or a switch stack.

Each session can include multiple ingress or egress source ports or VLANs, but you cannot combine source ports and source VLANs in a single session. Each session can include multiple destination ports.

When you use VLAN-based SPAN (VSPAN) to analyze network traffic in a VLAN or set of VLANs, all active ports in the source VLANs become source ports for the SPAN or RSPAN session. Trunk ports are included as source ports for VSPAN, and only packets with the monitored VLAN ID are sent to the destination port.

You can monitor traffic on a single port or VLAN or on a series or range of ports or VLANs. You select a series or range of interfaces or VLANs by using the [**,** | **-**] options.

If you specify a series of VLANs or interfaces, you must enter a space before and after the comma. If you specify a range of VLANs or interfaces, you must enter a space before and after the hyphen (**-**).

EtherChannel ports can be configured as SPAN or RSPAN destination ports. A physical port that is a member of an EtherChannel group can be used as a destination port, but it cannot participate in the EtherChannel group while it is as a SPAN destination.

A port used as a destination port cannot be a SPAN or RSPAN source, nor can a port be a destination port for more than one session at a time.

You can enable IEEE 802.1x authentication on a port that is a SPAN or RSPAN destination port; however, IEEE 802.1x authentication is disabled until the port is removed as a SPAN destination. If IEEE 802.1x authentication is not available on the port, the switch returns an error message. You can enable IEEE 802.1x authentication on a SPAN or RSPAN source port.

If ingress traffic forwarding is enabled for a network security device, the destination port forwards traffic at Layer 2.

Destination ports can be configured to function in these ways:

- When you enter **monitor session** *session_number* **destination interface** *interface-id* with no other keywords, egress encapsulation is untagged, and ingress forwarding is not enabled.

- When you enter **monitor session** *session_number* **destination interface** *interface-id* **ingress**, egress encapsulation is untagged; ingress encapsulation depends on the keywords that follow—**dot1q** or **untagged**.
- When you enter **monitor session** *session_number* **destination interface** *interface-id* **encapsulation replicate** with no other keywords, egress encapsulation replicates the source interface encapsulation; ingress forwarding is not enabled. (This applies to local SPAN only; RSPAN does not support encapsulation replication.)
- When you enter **monitor session** *session_number* **destination interface** *interface-id* **encapsulation replicate ingress**, egress encapsulation replicates the source interface encapsulation; ingress encapsulation depends on the keywords that follow—**dot1q** or **untagged**. (This applies to local SPAN only; RSPAN does not support encapsulation replication.)

You can verify your settings by entering the **show monitor** privileged EXEC command. You can display SPAN, RSPAN, FSPAN, and FRSPAN configuration on the switch by entering the **show running-config** privileged EXEC command. SPAN information appears near the end of the output.

Examples

This example shows how to create a local SPAN session 1 to monitor both sent and received traffic on source port 1 on stack member 1 to destination port 2 on stack member 2:

```
Device(config)# monitor session 1 source interface gigabitethernet1/0/1 both
Device(config)# monitor session 1 destination interface gigabitethernet1/0/2
```

This example shows how to delete a destination port from an existing local SPAN session:

```
Device(config)# no monitor session 2 destination interface gigabitethernet1/0/2
```

This example shows how to configure RSPAN source session 1 to monitor a source interface and to configure the destination RSPAN VLAN 900:

```
Device(config)# monitor session 1 source interface gigabitethernet1/0/1
Device(config)# monitor session 1 destination remote vlan 900
Device(config)# end
```

This example shows how to configure an RSPAN destination session 10 in the switch receiving the monitored traffic:

```
Device(config)# monitor session 10 source remote vlan 900
Device(config)# monitor session 10 destination interface gigabitethernet1/0/2
```

This example shows how to configure the destination port for ingress traffic on VLAN 5 by using a security device that supports IEEE 802.1Q encapsulation. Egress traffic replicates the source; ingress traffic uses IEEE 802.1Q encapsulation.

```
Device(config)# monitor session 2 destination interface gigabitethernet1/0/2 encapsulation
 dot1q ingress dot1q vlan 5
```

This example shows how to configure the destination port for ingress traffic on VLAN 5 by using a security device that does not support encapsulation. Egress traffic and ingress traffic are untagged.

```
Device(config)# monitor session 2 destination interface gigabitethernet1/0/2 ingress untagged
 vlan 5
```

monitor session filter

To start a new flow-based SPAN (FSPAN) session or flow-based RSPAN (FRSPAN) source or destination session, or to limit (filter) SPAN source traffic to specific VLANs, use the **monitor session filter** global configuration command. To remove filters from the SPAN or RSPAN session, use the **no** form of this command.

monitor session *session-number* **filter** {**vlan** *vlan-id* [**,** | **-**] }
no monitor session *session-number* **filter** {**vlan** *vlan-id* [**,** | **-**] }

Syntax Description

session-number	
vlan *vlan-id*	Specifies a list of VLANs as filters on trunk source ports to li VLANs. The *vlan-id* range is 1 to 4094.
,	(Optional) Specifies a series of VLANs, or separates a range Enter a space before and after the comma.
-	(Optional) Specifies a range of VLANs. Enter a space before

Command Default

No monitor sessions are configured.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

You can monitor traffic on a single VLAN or on a series or range of ports or VLANs. You select a series or range of VLANs by using the [**,** | **-**] options.

If you specify a series of VLANs, you must enter a space before and after the comma. If you specify a range of VLANs, you must enter a space before and after the hyphen (**-**).

VLAN filtering refers to analyzing network traffic on a selected set of VLANs on trunk source ports. By default, all VLANs are monitored on trunk source ports. You can use the **monitor session** *session_number* **filter vlan** *vlan-id* command to limit SPAN traffic on trunk source ports to only the specified VLANs.

VLAN monitoring and VLAN filtering are mutually exclusive. If a VLAN is a source, VLAN filtering cannot be enabled. If VLAN filtering is configured, a VLAN cannot become a source.

You can verify your settings by entering the **show monitor** privileged EXEC command. You can display SPAN, RSPAN, FSPAN, and FRSPAN configuration on the switch by entering the **show running-config** privileged EXEC command. SPAN information appears near the end of the output.

Examples

This example shows how to limit SPAN traffic in an existing session only to specific VLANs:

```
Switch(config)# monitor session 1 filter vlan 100 - 110
```

This example shows how to create a local SPAN session 1 to monitor both sent and received traffic on source port 1 on stack member 1 to destination port 2 on stack member 2 and to filter IPv4 traffic using access list number 122 in an FSPAN session:

```
Device(config)# monitor session 1 source interface gigabitethernet1/0/1 both
Device(config)# monitor session 1 destination interface gigabitethernet1/0/2
Device(config)# monitor session 1 filter ip access-group 122
```

monitor session source

To start a new Switched Port Analyzer (SPAN) session or Remote SPAN (RSPAN) source session, or to add or delete interfaces or VLANs to or from an existing SPAN or RSPAN session, use the **monitor session source** global configuration command. To remove the SPAN or RSPAN session or to remove source interfaces from the SPAN or RSPAN session, use the **no** form of this command.

monitor session *session_number* **source** {**interface** *interface-id* [**,** | **-**] [**both** | **rx** | **tx**] | [**remote**] **vlan** *vlan-id* [**,** | **-**] [**both** | **rx** | **tx**]}
no monitor session *session_number* **source** {**interface** *interface-id* [**,** | **-**] [**both** | **rx** | **tx**] | [**remote**] **vlan** *vlan-id* [**,** | **-**] [**both** | **rx** | **tx**]}

Syntax Description

session_number	
interface *interface-id*	Specifies the source interface for a SPAN or RSPAN session. Valid interfaces are physical ports (including type, stack member, module, and port number). For source interface, port channel is also a valid interface type, and the valid range is 1 to 48.
,	(Optional) Specifies a series of interfaces or VLANs, or separates a range of interfaces or VLANs from a previous range. Enter a space before and after the comma.
-	(Optional) Specifies a range of interfaces or VLANs. Enter a space before and after the hyphen.
both | **rx** | **tx**	(Optional) Specifies the traffic direction to monitor. If you do not specify a traffic direction, the source interface sends both transmitted and received traffic.
remote	(Optional) Specifies the remote VLAN for an RSPAN source or destination session. The range is 2 to 1001 and 1006 to 4094. The RSPAN VLAN cannot be VLAN 1 (the default VLAN) or VLAN IDs 1002 to 1005 (reserved for Token Ring and FDDI VLANs).
vlan *vlan-id*	When used with only the **ingress** keyword, sets default VLAN for ingress traffic.

Command Default

No monitor sessions are configured.

On a source interface, the default is to monitor both received and transmitted traffic.

On a trunk interface used as a source port, all VLANs are monitored.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Traffic that enters or leaves source ports or source VLANs can be monitored by using SPAN or RSPAN. Traffic routed to source ports or source VLANs cannot be monitored.

A source can be a physical port, a port channel, or a VLAN.

Each session can include multiple ingress or egress source ports or VLANs, but you cannot combine source ports and source VLANs in a single session. Each session can include multiple destination ports.

When you use VLAN-based SPAN (VSPAN) to analyze network traffic in a VLAN or set of VLANs, all active ports in the source VLANs become source ports for the SPAN or RSPAN session. Trunk ports are included as source ports for VSPAN, and only packets with the monitored VLAN ID are sent to the destination port.

You can monitor traffic on a single port or VLAN or on a series or range of ports or VLANs. You select a series or range of interfaces or VLANs by using the [**,** | **-**] options.

If you specify a series of VLANs or interfaces, you must enter a space before and after the comma. If you specify a range of VLANs or interfaces, you must enter a space before and after the hyphen (**-**).

You can monitor individual ports while they participate in an EtherChannel, or you can monitor the entire EtherChannel bundle by specifying the **port-channel** number as the RSPAN source interface.

A port used as a destination port cannot be a SPAN or RSPAN source, nor can a port be a destination port for more than one session at a time.

You can enable IEEE 802.1x authentication on a SPAN or RSPAN source port.

You can verify your settings by entering the **show monitor** privileged EXEC command. You can display SPAN, RSPAN, FSPAN, and FRSPAN configuration on the switch by entering the **show running-config** privileged EXEC command. SPAN information appears near the end of the output.

Examples

This example shows how to create a local SPAN session 1 to monitor both sent and received traffic on source port 1 on stack member 1 to destination port 2 on stack member 2:

```
Switch(config)# monitor session 1 source interface gigabitethernet1/0/1 both
Switch(config)# monitor session 1 destination interface gigabitethernet1/0/2
```

This example shows how to configure RSPAN source session 1 to monitor multiple source interfaces and to configure the destination RSPAN VLAN 900.

```
Switch(config)# monitor session 1 source interface gigabitethernet1/0/1
Switch(config)# monitor session 1 source interface port-channel 2 tx
Switch(config)# monitor session 1 destination remote vlan 900
Switch(config)# end
```

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 {**exporter-stats** | **interface-table** | **sampler-table**} [**timeout** *seconds*]
no option {**exporter-stats** | **interface-table** | **sampler-table**}

Syntax Description

exporter-stats	Configures the exporter statistics option for flow exporters.
interface-table	Configures the interface table option for flow exporters.
sampler-table	Configures the export sampler table option for flow exporters.
timeout *seconds*	(Optional) Configures the option resend time in seconds for flow exporters. The range is 1 to 86400. The default is 600.

Command Default

The timeout is 600 seconds. All other optional data parameters are not configured.

Command Modes

Flow exporter configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

The **option exporter-stats** command causes the periodic sending of the exporter statistics, including the number of records, bytes, and packets sent. This command allows the collector to estimate packet loss for the export records it receives. The optional timeout alters the frequency at which the reports are sent.

The **option interface-table** command causes the periodic sending of an options table, which allows the collector to map the interface SNMP indexes provided in the flow records to interface names. The optional timeout can alter the frequency at which the reports are sent.

The **option sampler-table** command causes the periodic sending of an options table, which details the configuration of each sampler and allows the collector to map the sampler ID provided in any flow record to a configuration that it can use to scale up the flow statistics. The optional timeout can alter the frequency at which the reports are sent.

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

The following example shows how to enable the periodic sending of the sampler option table, which allows the collector to map the sampler ID to the sampler type and rate:

```
Device(config)# flow exporter FLOW-EXPORTER-1
Device(config-flow-exporter)# option sampler-table
```

The following example shows how to enable the periodic sending of the exporter statistics, including the number of records, bytes, and packets sent:

```
Device(config)# flow exporter FLOW-EXPORTER-1
Device(config-flow-exporter)# option exporter-stats
```

The following example shows how to enable the periodic sending of an options table, which allows the collector to map the interface SNMP indexes provided in the flow records to interface names:

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

pnpa service reset

To perform factory reset on the device and reload using Cisco Plug and Play (PnP) agent, use the **pnpa service reset** command in privileged EXEC mode.

pnpa service reset [**no-prompt** | **no-reload**]

Syntax Description

no-prompt	(Optional) Resets the device without any prompt.
no-reload	(Optional) Resets the device without reloading it.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

The **pnpa service reset** command does a clean up of the nvram, clears the vlan.dat and crashinfo files in the flash, and reloads the device. The subsequent reload triggers PnP as the startup configuration is erased due to factory reset. This command is applicable for both autonomous and controller modes.

Examples

The following example shows how to reset a device using the **pnpa service reset** command:

```
Device> enable
Device# pnpa service reset
```

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 Fuji 16.9.2	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:

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

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 Fuji 16.9.2	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:

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

show class-map type control subscriber

To display the class map statistics for the configured control policies, use the **show class-map type control subscriber** command in privileged EXEC mode.

show class-map type control subscriber {all | name *control-class-name***}**

Syntax Description

all	Displays class map statistics for all control policies.
name *control-class-name*	Displays class map statistics for the specified control policy.

Command Modes

Privileged EXEC (#)

Command History

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

Examples

The following is a sample output of the **show class-map type control subscriber name** *control-class-name* command:

```
Device# show class-map type control subscriber name platform

Class-map                 Action                       Exec  Hit  Miss  Comp
---------                 ------                       ----  ---  ----  ----
match-all platform        match platform-type C9xxx    0     0    0     0
Key:
  "Exec" - The number of times this line was executed
  "Hit"  - The number of times this line evaluated to TRUE
  "Miss" - The number of times this line evaluated to FALSE
  "Comp" - The number of times this line completed the execution of its
       condition without a need to continue on to the end
```

show ip sla statistics

To display current or aggregated operational status and statistics of all Cisco IOS IP Service Level Agreement (SLA) operations or a specified operation, use the **show ip sla statistics** command in user EXEC or privileged EXEC mode.

show ip sla statistics [*operation-number* [**details**] | **aggregated** [*operation-number* | **details**] | **details**]

Syntax Description

operation-number	(Optional) Number of the operation for which operational status and statistics are displayed. Accepted values are from 1 to 2147483647.
details	(Optional) Specifies detailed output.
aggregated	(Optional) Specifies the IP SLA aggregated statistics.

Command Default

Displays output for all running IP SLA operations.

Command Modes

User EXEC

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Use the **show ip sla statistics** to display the current state of IP SLA operations, including how much life the operation has left, whether the operation is active, and the completion time. The output also includes the monitoring data returned for the last (most recently completed) operation. This generated operation ID is displayed when you use the **show ip sla** configuration command for the base multicast operation, and as part of the summary statistics for the entire operation.

Enter the **show** command for a specific operation ID to display details for that one responder.

Examples

The following is sample output from the **show ip sla statistics** command:

```
Device# show ip sla statistics

Current Operational State
Entry Number: 3
Modification Time: *22:15:43.000 UTC Sun Feb 11 2001
Diagnostics Text:
Last Time this Entry was Reset: Never
Number of Octets in use by this Entry: 1332
Number of Operations Attempted: 2
Current Seconds Left in Life: 3511
Operational State of Entry: active
Latest Completion Time (milliseconds): 544
Latest Operation Start Time: *22:16:43.000 UTC Sun Feb 11 2001
Latest Oper Sense: ok
Latest Sense Description: 200  OK
```

```
Total RTT: 544
DNS RTT: 12
TCP Connection RTT: 28
HTTP Transaction RTT: 504
HTTP Message Size: 9707
```

show monitor

To display information about all Switched Port Analyzer (SPAN) and Remote SPAN (RSPAN) sessions, use the **show monitor** command in EXEC mode.

show monitor [**session** {*session_number* | **all** | **local** | **range** *list* | **remote**} [**detail**]]

Syntax Description

session	(Optional) Displays information about specified SPAN sessions.
session_number	
all	(Optional) Displays all SPAN sessions.
local	(Optional) Displays only local SPAN sessions.
range *list*	(Optional) Displays a range of SPAN sessions, where *list* is the range of valid sessions. The range is either a single session or a range of sessions described by two numbers, the lower one first, separated by a hyphen. Do not enter any spaces between comma-separated parameters or in hyphen-specified ranges. **Note** This keyword is available only in privileged EXEC mode.
remote	(Optional) Displays only remote SPAN sessions.
detail	(Optional) Displays detailed information about the specified sessions.

Command Modes

User EXEC

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

The output is the same for the **show monitor** command and the **show monitor session all** command.

Examples

This is an example of output for the **show monitor** user EXEC command:

```
Device# show monitor
Session 1
---------
Type : Local Session
Source Ports :
```

```
RX Only : Gi4/0/1
Both : Gi4/0/2-3,Gi4/0/5-6
Destination Ports : Gi4/0/20
Encapsulation : Replicate
Ingress : Disabled
Session 2
---------
Type : Remote Source Session
Source VLANs :
TX Only : 10
Both : 1-9
Dest RSPAN VLAN : 105
```

This is an example of output for the **show monitor** user EXEC command for local SPAN source session 1:

```
Device# show monitor session 1
Session 1
---------
Type : Local Session
Source Ports :
RX Only : Gi4/0/1
Both : Gi4/0/2-3,Gi4/0/5-6
Destination Ports : Gi4/0/20
Encapsulation : Replicate
Ingress : Disabled
```

This is an example of output for the **show monitor session all** user EXEC command when ingress traffic forwarding is enabled:

```
Device# show monitor session all
Session 1
---------
Type : Local Session
Source Ports :
Both : Gi4/0/2
Destination Ports : Gi4/0/3
Encapsulation : Native
Ingress : Enabled, default VLAN = 5
Ingress encap : DOT1Q
Session 2
---------
Type : Local Session
Source Ports :
Both : Gi4/0/8
Destination Ports : Gi4/012
Encapsulation : Replicate
Ingress : Enabled, default VLAN = 4
Ingress encap : Untagged
```

show monitor capture

To display monitor capture (WireShark) content, use the **show monitor capture** command in privileged EXEC mode.

show monitor capture [*capture-name* [**buffer**] | **file** *file-location* **:** *file-name*][**brief** | **detailed** | **display-filter** *display-filter-string*]

Syntax Description

capture-name	(Optional) Specifies the name of the capture to be displayed.
buffer	(Optional) Specifies that a buffer associated with the named capture is to be displayed.
file *file-location* : *file-name*	(Optional) Specifies the file location and name of the capture storage file to be displayed.
brief	(Optional) Specifies the display content in brief.
detailed	(Optional) Specifies detailed display content.
display-filter *display-filter-string*	Filters the display content according to the *display-filter-string*.

Command Default

Displays all capture content.

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Example

The following is sample output from the **show monitor capture** command:

```
Device# show monitor capture mycap

Status Information for Capture mycap
  Target Type:
  Interface: CAPWAP,
    Ingress:
 0
    Egress:
 0
   Status : Active
  Filter Details:
    Capture all packets
  Buffer Details:
   Buffer Type: LINEAR (default)
  File Details:
   Associated file name: flash:mycap.pcap
   Size of buffer(in MB): 1
  Limit Details:
   Number of Packets to capture: 0 (no limit)
```

```
Packet Capture duration: 0 (no limit)
Packet Size to capture: 0 (no limit)
Packets per second: 0 (no limit)
Packet sampling rate: 0 (no sampling)
```

show parameter-map type subscriber attribute-to-service

To display parameter map statistics, use the **show parameter-map type subscriber attribute-to-service** command in privileged EXEC mode.

show parameter-map type subscriber attribute-to-service {all | name *parameter-map-name***}**

Syntax Description

all	Displays statistics for all parameter maps.
name *parameter-map-name*	Displays statistics for the specified parameter map.

Command Modes

Privileged EXEC (#)

Command History

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

Examples

The following is a sample output of the **show parameter-map type subscriber attribute-to-service name** *parameter-map-name* command:

```
Device# show parameter-map type subscriber attribute-to-service name platform


Parameter-map name: platform
 Map: 10 platform-type regex "C9xxx"
  Action(s):
     10 interface-template critical
```

show platform software fed switch ip wccp

To display platform-dependent Web Cache Communication Protocol (WCCP) information, use the **show platform software fed switch ip wccp** privileged EXEC command.

```
show platform software fed switch {switch-number | active | standby}ip wccp
{cache-engines |interfaces |service-groups}
```

Syntax Description

switch {*switch_num* | **active** | **standby**}	The device for which you want to display information. • *switch_num*—Enter the switch ID. Displays information for the specified switch. • **active**—Displays information for the active switch. • **standby**—Displays information for the standby switch, if available.
cache-engines	Displays WCCP cache engines.
interfaces	Displays WCCP interfaces.
service-groups	Displays WCCP service groups.

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Use this command only when you are working directly with a technical support representative while troubleshooting a problem. Do not use this command unless a technical support representative asks you to do so.

This command is available only if your device is running the IP Services feature set.

The following example displays WCCP interfaces:

```
Device# show platform software fed switch 1 ip wccp interfaces

WCCP Interface Info

=====================

**** WCCP Interface: Port-channel13 iif_id: 000000000000007c (#SG:3),  VRF: 0 Ingress WCCP
 ****
port_handle:0x20000f9

List of Service Groups on this interface:
* Service group id:90 vrf_id:0 (ref count:24)
type: Dynamic     Open service      prot: PROT_TCP    l4_type: Dest ports     priority: 35
Promiscuous mode (no ports).
```

```
* Service group id:70 vrf_id:0 (ref count:24)
type: Dynamic     Open service      prot: PROT_TCP    l4_type: Dest ports     priority: 35
Promiscuous mode (no ports).


* Service group id:60 vrf_id:0 (ref count:24)
type: Dynamic     Open service      prot: PROT_TCP    l4_type: Dest ports     priority: 35
Promiscuous mode (no ports).



**** WCCP Interface: Port-channel14 iif_id: 000000000000007e (#SG:3),  VRF: 0 Ingress WCCP
 ****
port_handle:0x880000fa

List of Service Groups on this interface:
* Service group id:90 vrf_id:0 (ref count:24)
type: Dynamic     Open service      prot: PROT_TCP    l4_type: Dest ports     priority: 35
Promiscuous mode (no ports).


* Service group id:70 vrf_id:0 (ref count:24)
type: Dynamic     Open service      prot: PROT_TCP    l4_type: Dest ports     priority: 35
Promiscuous mode (no ports).
<output truncated>
```

show platform software swspan

To display switched port analyzer (SPAN) information, use the **show platform software swspan** command in privileged EXEC mode.

show platform software swspan {**switch**} { { {**F0** | **FP active**} **counters**} | **R0** | **RP active**} {**destination sess-id** *session-ID* | **source sess-id** *session-ID*}

Syntax Description

switch	Displays information about the switch.
F0	Displays information about the Embedded Service Processor (ESP) slot 0.
FP	Displays information about the ESP.
active	Displays information about the active instance of the ESP or the Route Processor (RP).
counters	Displays the SWSPAN message counters.
R0	Displays information about the RP slot 0.
RP	Displays information the RP.
destination sess-id *session-ID*	Displays information about the specified destination session.
source sess-id *session-ID*	Displays information about the specified source session.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced in a release prior to Cisco IOS XE Denali 16.1.1.

Usage Guidelines

If the session number does not exist or if the SPAN session is a remote destination session, the command output will display the following message "% Error: No Information Available."

Examples

The following is sample output from the **show platform software swspan FP active source** command:

```
Switch# show platform software swspan FP active source sess-id 0

Showing SPAN source detail info

Session ID : 0
Intf Type : PORT
Port dpidx : 30
PD Sess ID : 1
Session Type : Local
Direction : Ingress
Filter Enabled : No
ACL Configured : No
AOM Object id : 579
```

```
AOM Object Status : Done
Parent AOM object Id : 118
Parent AOM object Status : Done

Session ID : 9
Intf Type : PORT
Port dpidx : 8
PD Sess ID : 0
Session Type : Local
Direction : Ingress
Filter Enabled : No
ACL Configured : No
AOM Object id : 578
AOM Object Status : Done
Parent AOM object Id : 70
Parent AOM object Status : Done
```

The following is sample output from the **show platform software swspan RP active destination** command:

```
Switch# show platform software swspan RP active destination

Showing SPAN destination table summary info

Sess-id IF-type IF-id Sess-type
-------------------------------------
1 PORT 19 Remote
```

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**] | **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.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

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

```
Device# show flow exporter
Flow Exporter FLOW-EXPORTER-1:
  Description:              Exports to the datacenter
  Export protocol:          NetFlow Version 9
  Transport Configuration:
    Destination IP address: 192.168.0.1
    Source IP address:      192.168.0.2
    Transport Protocol:     UDP
    Destination Port:       9995
    Source Port:            55864
    DSCP:                   0x0
    TTL:                    255
    Output Features:        Used
```

This table describes the significant fields shown in the display:

Table 1: 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 device:

```
Device# show flow exporter name FLOW-EXPORTER-1 statistics
Flow Exporter FLOW-EXPORTER-1:
  Packet send statistics (last cleared 2w6d ago):
    Successfully sent:         0                     (0 bytes)
```

show flow interface

To display the 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 Fuji 16.9.2	This command was introduced.

Examples

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

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

Interface Ethernet1/0
        monitor:         FLOW-MONITOR-1
        direction:       Output
        traffic(ip):     on
Device# show flow interface gigabitethernet1/0/2
Interface Ethernet0/0
        monitor:         FLOW-MONITOR-1
        direction:       Input
        traffic(ip):     sampler SAMPLER-2#
```

The table below describes the significant fields shown in the display.

Table 2: show flow interface Field Descriptions

Field	Description
Interface	The interface to which the information applies.
monitor	The name of the flow monitor that is configured on the interface.
direction:	The direction of traffic that is being monitored by the flow monitor. The possible values are: • Input—Traffic is being received by the interface. • Output—Traffic is being transmitted by the interface.

Field	Description
traffic(ip)	Indicates if the flow monitor is in normal mode or sampler mode. The possible values are: • on—The flow monitor is in normal mode. • sampler—The flow monitor is in sampler mode (the name of the sampler will be included in the display).

show flow monitor

To display the status and statistics for a 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 Fuji 16.9.2	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:

```
Device# show flow monitor FLOW-MONITOR-1

Flow Monitor FLOW-MONITOR-1:
  Description:       Used for basic traffic analysis
```

```
Flow Record:       flow-record-1
Flow Exporter:     flow-exporter-1
                   flow-exporter-2
Cache:
  Type:              normal
  Status:            allocated
  Size:              4096 entries / 311316 bytes
  Inactive Timeout:  15 secs
  Active Timeout:    1800 secs
  Update Timeout:    1800 secs
```

This table describes the significant fields shown in the display.

Table 3: 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 possible values are: • immediate—Flows are expired immediately. • normal—Flows are expired normally. • Permanent—Flows are never expired.
Status	Status of the flow monitor cache. The possible values are: • allocated—The cache is allocated. • being deleted—The cache is being deleted. • not allocated—The cache is not allocated.
Size	Current cache size.
Inactive Timeout	Current value for the inactive timeout in seconds.
Active Timeout	Current value for the active timeout in seconds.
Update Timeout	Current value for the update timeout in seconds.

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

```
Device# 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 4: 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.
IPV6 DESTINATION ADDRESS	IPv6 destination address.
TRNS SOURCE PORT	Source port for the transport protocol.
TRNS DESTINATION PORT	Destination port for the transport protocol.

Field	Description
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:

```
Device# 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:

```
Device# 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:

```
Device# 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
```

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 Fuji 16.9.2	This command was introduced.

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

```
Device# show flow record FLOW-RECORD-1
flow record FLOW-RECORD-1:
  Description:        User defined
  No. of users:       0
  Total field space:  24 bytes
  Fields:
    match ipv6 destination address
    match transport source-port
    collect interface input
```

show 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 Fuji 16.9.2	This command was introduced.

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

```
Device# 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 5: 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 device 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.

show snmp stats

To display the SNMP statistics, use the **show snmp stats** command in privileged EXEC mode.

show snmp stats { **hosts** | **oid** }

Syntax Description

hosts	Displays the details of the SNMP servers polled to the SNMP agent.
oid	Displays recently requested object identifiers (OIDs).

Command Default

Displays the SNMP manager entries polled to the SNMP agent.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.1	This command was introduced.

Usage Guidelines

Use the **show snmp stats hosts** command to list the NMS IP address, the number of times an NMS polls the agent, and the timestamp of polling. To delete the entries polled to the SNMP agent, use the **clear snmp stats hosts** command.

Before running the **show snmp stats oid** command, connect the device to the NMS. The command output displays the list of OIDs recently requested by the NMS. It also displays the number of times an object identifier is requested by the NMS. This information is useful for troubleshooting memory leaks and network failures when little information is available about the MIBs that the NMS is querying. You can use the **show snmp stats oid** command at any time to view OIDs recently requested by the NMS.

The following is sample output of the **show snmp stats hosts** command.

```
Device# show snmp stats hosts
Request Count                   Last Timestamp              Address
2                               00:00:01 ago                3.3.3.3
1                               1w2d ago                    2.2.2.2
```

The table below describes the significant fields shown in the display:

Table 6: show snmp stats hosts Field Descriptions

Field	Description
`Request Count`	Displays the number of times an SNMP Manager has sent requests to the SNMP Agent.
`Last Timestamp`	Displays the time at which the request was sent to the SNMP Agent by the SNMP Manager.

Field	Description
Address	Displays the IP Address of the SNMP Manager that has sent the request.

The following is sample output of the **show snmp stats oid** command.

```
Device# show snmp stats oid

time-stamp                      #of times requested        OID
15:30:01 UTC Dec 2 2019                   6             ifPhysAddress
15:30:01 UTC Dec 2 2019                  10             system.2
15:30:01 UTC Dec 2 2019                   9             system.1
09:39:39 UTC Nov 26 2019                  3             system.5
09:39:39 UTC Nov 26 2019                  3             stem.4
09:39:39 UTC Nov 26 2019                  3             system.7
09:39:39 UTC Nov 26 2019                  2             system.6
09:39:39 UTC Nov 26 2019                 10             ceemEventMapEntry.2
09:39:39 UTC Nov 26 2019                  6             ipAddrEntry.4
09:39:39 UTC Nov 26 2019                  3             ipAddrEntry.5
09:39:39 UTC Nov 26 2019                 10             ipAddrEntry.3
09:39:39 UTC Nov 26 2019                  7             ipAddrEntry.2
09:39:39 UTC Nov 26 2019                  4             ipAddrEntry.1
09:39:39 UTC Nov 26 2019                  1             lsystem.3
```

The table below describes the significant fields shown in the display.

Table 7: show snmp stats oid Field Descriptions

Field	Description
time-stamp	Displays the time and date when the object identifiers is requested by the NMS.
#of times requested	Displays the number of times an object identifier is requested.
OID	Displays the object identifiers recently requested by the NMS.

snmp ifmib ifindex persist

To globally enable ifIndex values to persist , which will remain constant across reboots, for use by the Simple Network Management Protocol (SNMP), use the **snmp ifmib ifindex persist** command in global configuration mode. To globally disable ifIndex persistence, use the **no** form of this command.

snmp ifmib ifindex persist
no snmp ifmib ifindex persist

Syntax Description

This command has no arguments or keywords.

Command Default

The ifIndex persistence on a device is disabled.

Command Modes

Global configuration (config)

Usage Guidelines

The **snmp ifmib ifindex persist** command does not override an interface-specific configuration. The interface-specific configuration of ifIndex persistence is configured with the **snmp ifindex persist** and **snmp ifindex clear** commands in interface configuration mode.

The **snmp ifmib ifindex persist** command enables ifIndex persistence for all interfaces on a routing device by using the ifDescr and ifIndex entries in the ifIndex table of interface MIB (IF-MIB).

ifIndex persistence means that the ifIndex values in the IF-MIB persist across reboots, allowing for the consistent identification of specific interfaces that use SNMP.

If ifIndex persistence was previously disabled for a specific interface by using the **no snmp ifindex persist** command, ifIndex persistence will remain disabled for that interface.

Examples

The following example shows how to enable ifIndex persistence for all interfaces:

```
Device(config)# snmp ifmib ifindex persist
```

Related Commands

Command	Description
snmp ifindex clear	Clears any previously configured **snmp ifIndex** commands issued in interface configuration mode for a specific interface.
snmp ifindex persist	Enables ifIndex values that persist across reboots (ifIndex persistence) in the IF-MIB.

snmp-server community

To configure the community access string to permit access to the Simple Network Management Protocol (SNMP), use the **snmp-server community** command in global configuration mode. To remove the specified community string, use the **no** form of this command.

snmp-server community [**clear** | **encrypted**] *community-string* [**view** *view-name*] [**RO** | **RW**] [**SDROwner** | **SystemOwner**] [*access-list-name*]
no snmp-server community *community-string*

Syntax Description

clear	(Optional) Specifies that the entered community-string is clear text and should be encrypted when displayed by the **show running** command.
encrypted	(Optional) Specifies that the entered *community-string* is encrypted text and should be displayed as such by the **show running** command.
community-string	Community string that acts like a password and permits access to the SNMP protocol. The maximum length of the *community-string* argument is 32 alphabetic characters. If the **clear** keyword was used, *community-string* is assumed to be clear text. If the **encrypted** keyword was used, *community-string* is assumed to be encrypted. If neither was used, *community-string* is assumed to be clear text.
view*view-name*	(Optional) Specifies the name of a previously defined view. The view defines the objects available to the community.
RO	(Optional) Specifies read-only access. Authorized management stations are able only to retrieve MIB objects.
RW	(Optional) Specifies read-write access. Authorized management stations are able both to retrieve and to modify MIB objects.
SDROwner	(Optional) Limits access to the owner service domain router (SDR).
SystemOwner	(Optional) Provides system-wide access including access to all non-owner SDRs.
access-list-name	(Optional) Name of an access list of IP addresses allowed to use the community string to gain access to the SNMP agent.

Command Default

By default, an SNMP community string permits read-only access to all MIB objects. By default, a community string is assigned to the SDR owner.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	The command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server community** command to configure the community access string to permit access to SNMP.

To remove the specified community string, use the **no** form of this command.

Use the **clear** keyword to specify that the clear text community string you enter is displayed encrypted in the **show running** command output. To enter an encrypted string, use the **encrypted** keyword. To enter a clear text community string that is not encrypted by the system, use neither of these keywords.

When the **snmp-server community** command is entered with the **SDROwner** keyword, SNMP access is granted only to the MIB object instances in the owner SDR. When the **snmp-server community** command is entered with the **SystemOwner** keyword, SNMP access is granted to all SDRs in the system.

Note In a non-owner SDR, a community name provides access only to the object instances that belong to that SDR, regardless of the access privilege assigned to the community name. Access to the owner SDR and system-wide access privileges are available only from the owner SDR.

Examples

This example shows how to assign the string comaccess to SNMP, allowing read-only access, and to specify that IP access list 4 can use the community string:

```
RP/0/RP0/CPU0:router(config)# snmp-server community comaccess ro 4
```

The following example shows how to assign the string mgr to SNMP, allowing read-write access to the objects in the restricted view:

```
RP/0/RP0/CPU0:router(config)# snmp-server community mgr view restricted rw
```

This example shows how to remove the community comaccess:

```
RP/0/RP0/CPU0:router(config)# no snmp-server community comaccess
```

Related Commands

Command	Description
snmp-server view	Creates or updates an SNMP view entry.

snmp-server enable traps

To enable the device to send Simple Network Management Protocol (SNMP) notifications for various traps or inform requests to the network management system (NMS), use the **snmp-server enable traps** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps [**auth-framework** [**sec-violation**] | **bridge** | **call-home** | **config** | **config-copy** | **config-ctid** | **copy-config** | **cpu** | **dot1x** | **energywise** | **entity** | **envmon** | **errdisable** | **event-manager** | **flash** | **fru-ctrl** | **license** | **mac-notification** | **port-security** | **power-ethernet** | **rep** | **snmp** | **stackwise** | **storm-control** | **stpx** | **syslog** | **transceiver** | **tty** | **vlan-membership** | **vlancreate** | **vlandelete** | **vstack** | **vtp**]
no snmp-server enable traps [**auth-framework** [**sec-violation**] | **bridge** | **call-home** | **config** | **config-copy** | **config-ctid** | **copy-config** | **cpu** | **dot1x** | **energywise** | **entity** | **envmon** | **errdisable** | **event-manager** | **flash** | **fru-ctrl** | **license** | **mac-notification** | **port-security** | **power-ethernet** | **rep** | **snmp** | **stackwise** | **storm-control** | **stpx** | **syslog** | **transceiver** | **tty** | **vlan-membership** | **vlancreate** | **vlandelete** | **vstack** | **vtp**]

Syntax Description

auth-framework	(Optional) Enables SNMP CISCO-AUTH-FRAMEWORK-MIB traps.
sec-violation	(Optional) Enables SNMP camSecurityViolationNotif notifications.
bridge	(Optional) Enables SNMP STP Bridge MIB traps.*
call-home	(Optional) Enables SNMP CISCO-CALLHOME-MIB traps.*
config	(Optional) Enables SNMP configuration traps.
config-copy	(Optional) Enables SNMP configuration copy traps.
config-ctid	(Optional) Enables SNMP configuration CTID traps.
copy-config	(Optional) Enables SNMP copy-configuration traps.
cpu	(Optional) Enables CPU notification traps.*
dot1x	(Optional) Enables SNMP dot1x traps.*
energywise	(Optional) Enables SNMP energywise traps.*
entity	(Optional) Enables SNMP entity traps.
envmon	(Optional) Enables SNMP environmental monitor traps.*
errdisable	(Optional) Enables SNMP errdisable notification traps.*
event-manager	(Optional) Enables SNMP Embedded Event Manager traps.
flash	(Optional) Enables SNMP FLASH notification traps.*

fru-ctrl	(Optional) Generates entity field-replaceable unit (FRU) control traps. In a device stack, this trap refers to the insertion or removal of a device in the stack.
license	(Optional) Enables license traps.*
mac-notification	(Optional) Enables SNMP MAC Notification traps.*
port-security	(Optional) Enables SNMP port security traps.*
power-ethernet	(Optional) Enables SNMP power Ethernet traps.*
rep	(Optional) Enables SNMP Resilient Ethernet Protocol traps.
snmp	(Optional) Enables SNMP traps.*
stackwise	(Optional) Enables SNMP stackwise traps.*
storm-control	(Optional) Enables SNMP storm-control trap parameters.*
stpx	(Optional) Enables SNMP STPX MIB traps.*
syslog	(Optional) Enables SNMP syslog traps.
transceiver	(Optional) Enables SNMP transceiver traps.*
tty	(Optional) Sends TCP connection traps. This is enabled by default.
vlan-membership	(Optional) Enables SNMP VLAN membership traps.
vlancreate	(Optional) Enables SNMP VLAN-created traps.
vlandelete	(Optional) Enables SNMP VLAN-deleted traps.
vstack	(Optional) Enables SNMP Smart Install traps.*
vtp	(Optional) Enables VLAN Trunking Protocol (VTP) traps.

Command Default

The sending of SNMP traps is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

The command options marked with an asterisk in the table above have subcommands. For more information on these subcommands, see the Related Commands section below.

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

When supported, use the **snmp-server enable traps** command to enable sending of traps or informs.

Note Though visible in the command-line help strings, the **fru-ctrl, insertion**, and **removal** keywords are not supported on the device. The **snmp-server enable informs** global configuration command is not supported. To enable the sending of SNMP inform notifications, use the **snmp-server enable traps** global configuration command combined with the **snmp-server host** *host-addr* **informs** global configuration command.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to enable more than one type of SNMP trap:

```
Device(config)# snmp-server enable traps config
Device(config)# snmp-server enable traps vtp
```

snmp-server enable traps bridge

To generate STP bridge MIB traps, use the **snmp-server enable traps bridge** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps bridge [**newroot**] [**topologychange**]
no snmp-server enable traps bridge [**newroot**] [**topologychange**]

Syntax Description

newroot	(Optional) Enables SNMP STP bridge MIB new root traps.
topologychange	(Optional) Enables SNMP STP bridge MIB topology change traps.

Command Default

The sending of bridge SNMP traps is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to send bridge new root traps to the NMS:

```
Device(config)# snmp-server enable traps bridge newroot
```

snmp-server enable traps bulkstat

To enable data-collection-MIB traps, use the **snmp-server enable traps bulkstat** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps bulkstat [**collection** | **transfer**]
no snmp-server enable traps bulkstat [**collection** | **transfer**]

Syntax Description

collection	(Optional) Enables data-collection-MIB collection traps.
transfer	(Optional) Enables data-collection-MIB transfer traps.

Command Default

The sending of data-collection-MIB traps is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to generate data-collection-MIB collection traps:

```
Device(config)# snmp-server enable traps bulkstat collection
```

snmp-server enable traps call-home

To enable SNMP CISCO-CALLHOME-MIB traps, use the **snmp-server enable traps call-home** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps call-home [**message-send-fail** | **server-fail**]
no snmp-server enable traps call-home [**message-send-fail** | **server-fail**]

Syntax Description

message-send-fail	(Optional) Enables SNMP message-send-fail traps.
server-fail	(Optional) Enables SNMP server-fail traps.

Command Default

The sending of SNMP CISCO-CALLHOME-MIB traps is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to generate SNMP message-send-fail traps:

```
Device(config)# snmp-server enable traps call-home message-send-fail
```

snmp-server enable traps cef

To enable SNMP Cisco Express Forwarding (CEF) traps, use the **snmp-server enable traps cef** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps cef [**inconsistency** | **peer-fib-state-change** | **peer-state-change** | **resource-failure**]
no snmp-server enable traps cef [**inconsistency** | **peer-fib-state-change** | **peer-state-change** | **resource-failure**]

Syntax Description

inconsistency	(Optional) Enables SNMP CEF Inconsistency traps.
peer-fib-state-change	(Optional) Enables SNMP CEF Peer FIB State change traps.
peer-state-change	(Optional) Enables SNMP CEF Peer state change traps.
resource-failure	(Optional) Enables SNMP CEF Resource Failure traps.

Command Default

The sending of SNMP CEF traps is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to generate SNMP CEF inconsistency traps:

```
Device(config)# snmp-server enable traps cef inconsistency
```

snmp-server enable traps envmon

To enable SNMP environmental traps, use the **snmp-server enable traps envmon** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps envmon [**status**]
no snmp-server enable traps envmon [**status**]

Syntax Description

status	(Optional) Enables SNMP environmental status-change traps.

Command Default

The sending of environmental SNMP traps is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

In addition to enabling environmental status-change traps, the **snmp-server enable traps envmon status** command also enables traps for fan, power supply and temperature.

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to generate status-change traps:

```
Device(config)# snmp-server enable traps envmon status
```

snmp-server enable traps errdisable

To enable SNMP notifications of error-disabling, use the **snmp-server enable traps errdisable** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps errdisable [**notification-rate** *number-of-notifications*]
no snmp-server enable traps errdisable [**notification-rate** *number-of-notifications*]

Syntax Description

notification-rate *number-of-notifications*	(Optional) Specifies number of notifications per minute as the notification rate. Accepted values are from 0 to 10000.

Command Default

The sending of SNMP notifications of error-disabling is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to set the number SNMP notifications of error-disabling to 2:

```
Device(config)# snmp-server enable traps errdisable notification-rate 2
```

snmp-server enable traps flash

To enable SNMP flash notifications, use the **snmp-server enable traps flash** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps flash [**insertion**] [**removal**]
no snmp-server enable traps flash [**insertion**] [**removal**]

Syntax Description

insertion	(Optional) Enables SNMP flash insertion notifications.
removal	(Optional) Enables SNMP flash removal notifications.

Command Default

The sending of SNMP flash notifications is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to generate SNMP flash insertion notifications:

```
Device(config)# snmp-server enable traps flash insertion
```

snmp-server enable traps isis

To enable intermediate system-to-intermediate system (IS-IS) link-state routing protocol traps, use the **snmp-server enable traps isis** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps isis [**errors** | **state-change**]
no snmp-server enable traps isis [**errors** | **state-change**]

Syntax Description

errors	(Optional) Enables IS-IS error traps.
state-change	(Optional) Enables IS-IS state change traps.

Command Default

The sending of IS-IS traps is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to generate IS-IS error traps:

```
Device(config)# snmp-server enable traps isis errors
```

snmp-server enable traps license

To enable license traps, use the **snmp-server enable traps license** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps license [**deploy**] [**error**] [**usage**]
no snmp-server enable traps license [**deploy**] [**error**] [**usage**]

Syntax Description

deploy	(Optional) Enables license deployment traps.
error	(Optional) Enables license error traps.
usage	(Optional) Enables license usage traps.

Command Default

The sending of license traps is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to generate license deployment traps:

```
Device(config)# snmp-server enable traps license deploy
```

snmp-server enable traps mac-notification

To enable SNMP MAC notification traps, use the **snmp-server enable traps mac-notification** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps mac-notification [**change**] [**move**] [**threshold**]
no snmp-server enable traps mac-notification [**change**] [**move**] [**threshold**]

Syntax Description

change	(Optional) Enables SNMP MAC change traps.
move	(Optional) Enables SNMP MAC move traps.
threshold	(Optional) Enables SNMP MAC threshold traps.

Command Default

The sending of SNMP MAC notification traps is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to generate SNMP MAC notification change traps:

```
Device(config)# snmp-server enable traps mac-notification change
```

snmp-server enable traps ospf

To enable SNMP Open Shortest Path First (OSPF) traps, use the **snmp-server enable traps ospf** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps ospf [**cisco-specific** | **errors** | **lsa** | **rate-limit** *rate-limit-time max-number-of-traps* | **retransmit** | **state-change**]
no snmp-server enable traps ospf [**cisco-specific** | **errors** | **lsa** | **rate-limit** *rate-limit-time max-number-of-traps* | **retransmit** | **state-change**]

Syntax Description

cisco-specific	(Optional) Enables Cisco-specific traps.
errors	(Optional) Enables error traps.
lsa	(Optional) Enables link-state advertisement (LSA) traps.
rate-limit	(Optional) Enables rate-limit traps.
rate-limit-time	(Optional) Specifies window of time in seconds for rate-limit traps. Accepted values are 2 to 60.
max-number-of-traps	(Optional) Specifies maximum number of rate-limit traps to be sent in window time.
retransmit	(Optional) Enables packet-retransmit traps.
state-change	(Optional) Enables state-change traps.

Command Default

The sending of OSPF SNMP traps is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to enable LSA traps:

```
Device(config)# snmp-server enable traps ospf lsa
```

snmp-server enable traps pim

To enable SNMP Protocol-Independent Multicast (PIM) traps, use the **snmp-server enable traps pim** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps pim [**invalid-pim-message**] [**neighbor-change**] [**rp-mapping-change**]
no snmp-server enable traps pim [**invalid-pim-message**] [**neighbor-change**] [**rp-mapping-change**]

Syntax Description

invalid-pim-message	(Optional) Enables invalid PIM message traps.
neighbor-change	(Optional) Enables PIM neighbor-change traps.
rp-mapping-change	(Optional) Enables rendezvous point (RP)-mapping change traps.

Command Default

The sending of PIM SNMP traps is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to enable invalid PIM message traps:

```
Device(config)# snmp-server enable traps pim invalid-pim-message
```

snmp-server enable traps port-security

To enable SNMP port security traps, use the **snmp-server enable traps port-security** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps port-security [**trap-rate** *value*]
no snmp-server enable traps port-security [**trap-rate** *value*]

Syntax Description

trap-rate *value*	(Optional) Sets the maximum number of port-security traps sent per second. The range is from 0 to 1000; the default is 0 (no limit imposed; a trap is sent at every occurrence).

Command Default

The sending of port security SNMP traps is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to enable port-security traps at a rate of 200 per second:

```
Device(config)# snmp-server enable traps port-security trap-rate 200
```

snmp-server enable traps power-ethernet

To enable SNMP power-over-Ethernet (PoE) traps, use the **snmp-server enable traps power-ethernet** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps power-ethernet {**group** *number* | **police**}
no snmp-server enable traps power-ethernet {**group** *number* | **police**}

Syntax Description

group *number*	Enables inline power group-based traps for the specified group number. Accepted values are from 1 to 9.
police	Enables inline power policing traps.

Command Default

The sending of power-over-Ethernet SNMP traps is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to enable power-over-Ethernet traps for group 1:

```
Device(config)# snmp-server enable traps poower-over-ethernet group 1
```

snmp-server enable traps snmp

To enable SNMP traps, use the **snmp-server enable traps snmp** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps snmp [**authentication**] [**coldstart**] [**linkdown**] [**linkup**] [**warmstart**]
no snmp-server enable traps snmp [**authentication**] [**coldstart**] [**linkdown**] [**linkup**] [**warmstart**]

Syntax Description

authentication	(Optional) Enables authentication traps.
coldstart	(Optional) Enables cold start traps.
linkdown	(Optional) Enables linkdown traps.
linkup	(Optional) Enables linkup traps.
warmstart	(Optional) Enables warmstart traps.

Command Default

The sending of SNMP traps is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to enable a warmstart SNMP trap:

```
Device(config)# snmp-server enable traps snmp warmstart
```

snmp-server enable traps storm-control

To enable SNMP storm-control trap parameters, use the **snmp-server enable traps storm-control** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps storm-control { **trap-rate** *number-of-minutes* }
no snmp-server enable traps storm-control { **trap-rate** }

Syntax Description

trap-rate *number-of-minutes*	(Optional) Specifies the SNMP storm-control trap rate in minutes. Accepted values are from 0 to 1000. The default is 0. Value 0 indicates that no limit is imposed and a trap is sent at every occurrence. When configured, **show run all** command output displays `no snmp-server enable traps storm-control`.

Command Default

The sending of SNMP storm-control trap parameters is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to set the SNMP storm-control trap rate to 10 traps per minute:

```
Device(config)# snmp-server enable traps storm-control trap-rate 10
```

snmp-server enable traps stpx

To enable SNMP STPX MIB traps, use the **snmp-server enable traps stpx** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps stpx [**inconsistency**] [**loop-inconsistency**] [**root-inconsistency**]
no snmp-server enable traps stpx [**inconsistency**] [**loop-inconsistency**] [**root-inconsistency**]

Syntax Description

inconsistency	(Optional) Enables SNMP STPX MIB inconsistency update traps.
loop-inconsistency	(Optional) Enables SNMP STPX MIB loop inconsistency update traps.
root-inconsistency	(Optional) Enables SNMP STPX MIB root inconsistency update traps.

Command Default

The sending of SNMP STPX MIB traps is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to generate SNMP STPX MIB inconsistency update traps:

```
Device(config)# snmp-server enable traps stpx inconsistency
```

snmp-server enable traps transceiver

To enable SNMP transceiver traps, use the **snmp-server enable traps transceiver** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps transceiver {**all**}
no snmp-server enable traps transceiver {**all**}

Syntax Description

all	(Optional) Enables all SNMP transceiver traps.

Command Default

The sending of SNMP transceiver traps is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to set all SNMP transceiver traps:

```
Device(config)# snmp-server enable traps transceiver all
```

snmp-server enable traps vrfmib

To allow SNMP vrfmib traps, use the **snmp-server enable traps vrfmib** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps vrfmib [**vnet-trunk-down** | **vnet-trunk-up** | **vrf-down** | **vrf-up**]
no snmp-server enable traps vrfmib [**vnet-trunk-down** | **vnet-trunk-up** | **vrf-down** | **vrf-up**]

Syntax Description

vnet-trunk-down	(Optional) Enables vrfmib trunk down traps.
vnet-trunk-up	(Optional) Enables vrfmib trunk up traps.
vrf-down	(Optional) Enables vrfmib vrf down traps.
vrf-up	(Optional) Enables vrfmib vrf up traps.

Command Default

The sending of SNMP vrfmib traps is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to generate vrfmib trunk down traps:

```
Device(config)# snmp-server enable traps vrfmib vnet-trunk-down
```

snmp-server enable traps vstack

To enable SNMP smart install traps, use the **snmp-server enable traps vstack** command in global configuration mode. Use the **no** form of this command to return to the default setting.

snmp-server enable traps vstack [**addition**] [**failure**] [**lost**] [**operation**]
no snmp-server enable traps vstack [**addition**] [**failure**] [**lost**] [**operation**]

Syntax Description

addition	(Optional) Enables client added traps.
failure	(Optional) Enables file upload and download failure traps.
lost	(Optional) Enables client lost trap.
operation	(Optional) Enables operation mode change traps.

Command Default

The sending of SNMP smart install traps is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

Specify the host (NMS) that receives the traps by using the **snmp-server host** global configuration command. If no trap types are specified, all trap types are sent.

Note Informs are not supported in SNMPv1.

To enable more than one type of trap, you must enter a separate **snmp-server enable traps** command for each trap type.

Examples

This example shows how to generate SNMP Smart Install client-added traps:

```
Device(config)# snmp-server enable traps vstack addition
```

snmp-server engineID

To configure a name for either the local or remote copy of SNMP, use the **snmp-server engineID** command in global configuration mode.

snmp-server engineID {**local** *engineid-string* | **remote** *ip-address* [**udp-port** *port-number*] *engineid-string*}

Syntax Description

local *engineid-string*	Specifies a 24-character ID string with the name of the copy of SNMP. You need not specify the entire 24-character engine ID if it has trailing zeros. Specify only the portion of the engine ID up to the point where only zeros remain in the value.
remote *ip-address*	Specifies the remote SNMP copy. Specify the *ip-address* of the device that contains the remote copy of SNMP.
udp-port *port-number*	(Optional) Specifies the User Datagram Protocol (UDP) port on the remote device. The default is 162.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

None

Examples

The following example configures a local engine ID of 123400000000000000000000:

```
Device(config)# snmp-server engineID local 1234
```

snmp-server group

To configure a new Simple Network Management Protocol (SNMP) group, use the **snmp-server group** command in global configuration mode. To remove a specified SNMP group, use the **no** form of this command.

snmp-server group *group-name* {**v1** | **v2c** | **v3** {**auth** | **noauth** | **priv**}} [**context** *context-name*] [**match** {**exact** | **prefix**}] [**read** *read-view*] [**write** *write-view*] [**notify** *notify-view*] [**access** [**ipv6** *named-access-list*] [*acl-numberacl-name*]]
no snmp-server group *group-name* {**v1** | **v2c** | **v3** {**auth** | **noauth** | **priv**}} [**context** *context-name*]

Syntax Description

group-name	Name of the group.
v1	Specifies that the group is using the SNMPv1 security model. SNMPv1 is the least secure of the possible SNMP security models.
v2c	Specifies that the group is using the SNMPv2c security model. The SNMPv2c security model allows informs to be transmitted and supports 64-character strings.
v3	Specifies that the group is using the SNMPv3 security model. SMNPv3 is the most secure of the supported security models. It allows you to explicitly configure authentication characteristics.
auth	Specifies authentication of a packet without encrypting it.
noauth	Specifies no authentication of a packet.
priv	Specifies authentication of a packet with encryption.
context	(Optional) Specifies the SNMP context to associate with this SNMP group and its views.
context-name	(Optional) Context name.
match	(Optional) Specifies an exact context match or matches only the context prefix.
exact	(Optional) Matches the exact context.
prefix	(Optional) Matches only the context prefix.
read	(Optional) Specifies a read view for the SNMP group. This view enables you to view only the contents of the agent.
read-view	(Optional) String of a maximum of 64 characters that is the name of the view. The default is that the read-view is assumed to be every object belonging to the Internet object identifier (OID) space (1.3.6.1), unless the **read** option is used to override this state.
write	(Optional) Specifies a write view for the SNMP group. This view enables you to enter data and configure the contents of the agent.

write-view	(Optional) String of a maximum of 64 characters that is the name of the view. The default is that nothing is defined for the write view (that is, the null OID). You must configure write access.
notify	(Optional) Specifies a notify view for the SNMP group. This view enables you to specify a notify, inform, or trap.
notify-view	(Optional) String of a maximum of 64 characters that is the name of the view. By default, nothing is defined for the notify view (that is, the null OID) until the **snmp-server host** command is configured. If a view is specified in the **snmp-server group** command, any notifications in that view that are generated will be sent to all users associated with the group (provided a SNMP server host configuration exists for the user). Cisco recommends that you let the software autogenerate the notify view. See the "Configuring Notify Views" section in this document.
access	(Optional) Specifies a standard access control list (ACL) to associate with the group.
ipv6	(Optional) Specifies an IPv6 named access list. If both IPv6 and IPv4 access lists are indicated, the IPv6 named access list must appear first in the list.
named-access-list	(Optional) Name of the IPv6 access list.
acl-number	(Optional) The *acl-number*argument is an integer from 1 to 99 that identifies a previously configured standard access list.
acl-name	(Optional) The *acl-name* argument is a string of a maximum of 64 characters that is the name of a previously configured standard access list.

Command Default

No SNMP server groups are configured.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Fuji 16.8.1a	This command was introduced.

Usage Guidelines

When a community string is configured internally, two groups with the name public are autogenerated, one for the v1 security model and the other for the v2c security model. Similarly, deleting a community string will delete a v1 group with the name public and a v2c group with the name public.

No default values exist for authentication or privacy algorithms when you configure the **snmp-server group** command. Also, no default passwords exist. For information about specifying a Message Digest 5 (MD5) password, see the documentation of the **snmp-server user** command.

Configuring Notify Views

The notify-view option is available for two reasons:

- If a group has a notify view that is set using SNMP, you may need to change the notify view.

- The **snmp-server host** command may have been configured before the **snmp-server group** command. In this case, you must either reconfigure the **snmp-server host** command, or specify the appropriate notify view.

Specifying a notify view when configuring an SNMP group is not recommended, for the following reasons:

- The **snmp-server host** command autogenerates a notify view for the user, and then adds it to the group associated with that user.
- Modifying the group's notify view will affect all users associated with that group.

Instead of specifying the notify view for a group as part of the **snmp-server group** command, use the following commands in the order specified:

1. **snmp-server user**—Configures an SNMP user.
2. **snmp-server group**—Configures an SNMP group, without adding a notify view .
3. **snmp-server host**—Autogenerates the notify view by specifying the recipient of a trap operation.

SNMP Contexts

SNMP contexts provide VPN users with a secure way of accessing MIB data. When a VPN is associated with a context, that VPN's specific MIB data exists in that context. Associating a VPN with a context enables service providers to manage networks with multiple VPNs. Creating and associating a context with a VPN enables a provider to prevent the users of one VPN from accessing information about users of other VPNs on the same networking device.

Use this command with the **context** *context-name* keyword and argument to associate a read, write, or notify SNMP view with an SNMP context.

Create an SNMP Group

The following example shows how to create the SNMP server group "public," allowing read-only access for all objects to members of the standard named access list "lmnop":

```
Device(config)# snmp-server group public v2c access lmnop
```

Remove an SNMP Server Group

The following example shows how to remove the SNMP server group "public" from the configuration:

```
Device(config)# no snmp-server group public v2c
```

Associate an SNMP Server Group with Specified Views

The following example shows SNMP context "A" associated with the views in SNMPv2c group "GROUP1":

```
Device(config)# snmp-server context A
Device(config)# snmp mib community commA
```

```
Device(config)# snmp mib community-map commA context A target-list commAVpn
Device(config)# snmp-server group GROUP1 v2c context A read viewA write viewA notify viewB
```

Related Commands

Command	Description
show snmp group	Displays the names of groups on the device and the security model, the status of the different views, and the storage type of each group.
snmp mib community-map	Associates a SNMP community with an SNMP context, engine ID, security name, or VPN target list.
snmp-server host	Specifies the recipient of a SNMP notification operation.
snmp-server user	Configures a new user to a SNMP group.

snmp-server host

To specify the recipient (host) of a Simple Network Management Protocol (SNMP) notification operation, use the **snmp-server host** global configuration command on the device. Use the **no** form of this command to remove the specified host.

snmp-server host {*host-addr* } [**vrf** *vrf-instance*] [**informs** | **traps**] [**version** {**1** | **2c** | **3** {**auth** | **noauth** | **priv**} }] {*community-string* [*notification-type*] }
no snmp-server host {*host-addr* } [**vrf** *vrf-instance*] [**informs** | **traps**] [**version** {**1** | **2c** | **3** {**auth** | **noauth** | **priv**} }] {*community-string* [*notification-type*] }

Syntax Description

host-addr	Name or Internet address of the host (the targeted recipient).
vrf *vrf-instance*	(Optional) Specifies the virtual private network (VPN) routing instance and name for this host.
informs | **traps**	(Optional) Sends SNMP traps or informs to this host.
version 1 | **2c** | **3**	(Optional) Specifies the version of the SNMP used to send the traps. **1**—SNMPv1. This option is not available with informs. **2c**—SNMPv2C. **3**—SNMPv3. One of the authorization keywords (see next table row) must follow the Version 3 keyword.
auth | **noauth** | **priv**	**auth** (Optional)—Enables Message Digest 5 (MD5) and Secure Hash Algorithm (SHA) packet authentication. **noauth** (Default)—The noAuthNoPriv security level. This is the default if the **auth** | **noauth** | **priv** keyword choice is not specified. **priv** (Optional)—Enables Data Encryption Standard (DES) packet encryption (also called privacy).
community-string	Password-like community string sent with the notification operation. Though you can set this string by using the **snmp-server host** command, we recommend that you define this string by using the **snmp-server community** global configuration command before using the **snmp-server host** command. **Note** The @ symbol is used for delimiting the context information. Avoid using the @ symbol as part of the SNMP community string when configuring this command.

notification-type	(Optional) Type of notification to be sent to the host. If no type is specified, all notifications are sent. The notification type can be one or more of the these keywords: • **auth-framework**—Sends SNMP CISCO-AUTH-FRAMEWORK-MIB traps. • **bridge**—Sends SNMP Spanning Tree Protocol (STP) bridge MIB traps. • **bulkstat**—Sends Data-Collection-MIB Collection notification traps. • **call-home**—Sends SNMP CISCO-CALLHOME-MIB traps. • **cef**—Sends SNMP CEF traps. • **config**—Sends SNMP configuration traps. • **config-copy**—Sends SNMP config-copy traps. • **config-ctid**—Sends SNMP config-ctid traps. • **copy-config**—Sends SNMP copy configuration traps. • **cpu**—Sends CPU notification traps. • **cpu threshold**—Sends CPU threshold notification traps. • **entity**—Sends SNMP entity traps.

- **envmon**—Sends environmental monitor traps.
- **errdisable**—Sends SNMP errdisable notification traps.
- **event-manager**—Sends SNMP Embedded Event Manager traps.
- **flash**—Sends SNMP FLASH notifications.
- **flowmon**—Sends SNMP flowmon notification traps.
- **ipmulticast**—Sends SNMP IP multicast routing traps.
- **ipsla**—Sends SNMP IP SLA traps.
- **license**—Sends license traps.
- **local-auth**—Sends SNMP local auth traps.
- **mac-notification**—Sends SNMP MAC notification traps.
- **pim**—Sends SNMP Protocol-Independent Multicast (PIM) traps.
- **power-ethernet**—Sends SNMP power Ethernet traps.
- **snmp**—Sends SNMP-type traps.
- **storm-control**—Sends SNMP storm-control traps.
- **stpx**—Sends SNMP STP extended MIB traps.
- **syslog**—Sends SNMP syslog traps.
- **transceiver**—Sends SNMP transceiver traps.
- **tty**—Sends TCP connection traps.
- **vlan-membership**— Sends SNMP VLAN membership traps.
- **vlancreate**—Sends SNMP VLAN-created traps.
- **vlandelete**—Sends SNMP VLAN-deleted traps.
- **vrfmib**—Sends SNMP vrfmib traps.
- **vtp**—Sends SNMP VLAN Trunking Protocol (VTP) traps.
- **wireless**—Sends wireless traps.

Command Default

This command is disabled by default. No notifications are sent.

If you enter this command with no keywords, the default is to send all trap types to the host. No informs are sent to this host.

If no **version** keyword is present, the default is Version 1.

If Version 3 is selected and no authentication keyword is entered, the default is the **noauth** (noAuthNoPriv) security level.

Note Though visible in the command-line help strings, the **fru-ctrl** keyword is not supported.

Command Modes Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Usage Guidelines

SNMP notifications can be sent as traps or inform requests. Traps are unreliable because the receiver does not send acknowledgments when it receives traps. The sender cannot determine if the traps were received. However, an SNMP entity that receives an inform request acknowledges the message with an SNMP response PDU. If the sender never receives the response, the inform request can be sent again, so that informs are more likely to reach their intended destinations.

However, informs consume more resources in the agent and in the network. Unlike a trap, which is discarded as soon as it is sent, an inform request must be held in memory until a response is received or the request times out. Traps are also sent only once, but an inform might be retried several times. The retries increase traffic and contribute to a higher overhead on the network.

If you do not enter an **snmp-server host** command, no notifications are sent. To configure the device to send SNMP notifications, you must enter at least one **snmp-server host** command. If you enter the command with no keywords, all trap types are enabled for the host. To enable multiple hosts, you must enter a separate **snmp-server host** command for each host. You can specify multiple notification types in the command for each host.

If a local user is not associated with a remote host, the device does not send informs for the **auth** (authNoPriv) and the **priv** (authPriv) authentication levels.

When multiple **snmp-server host** commands are given for the same host and kind of notification (trap or inform), each succeeding command overwrites the previous command. Only the last **snmp-server host** command is in effect. For example, if you enter an **snmp-server host inform** command for a host and then enter another **snmp-server host inform** command for the same host, the second command replaces the first.

The **snmp-server host** command is used with the **snmp-server enable traps** global configuration command. Use the **snmp-server enable traps** command to specify which SNMP notifications are sent globally. For a host to receive most notifications, at least one **snmp-server enable traps** command and the **snmp-server host** command for that host must be enabled. Some notification types cannot be controlled with the **snmp-server enable traps** command. For example, some notification types are always enabled. Other notification types are enabled by a different command.

The **no snmp-server host** command with no keywords disables traps, but not informs, to the host. To disable informs, use the **no snmp-server host informs** command.

Examples

This example shows how to configure a unique SNMP community string named comaccess for traps and prevent SNMP polling access with this string through access-list 10:

```
Device(config)# snmp-server community comaccess ro 10
Device(config)# snmp-server host 172.20.2.160 comaccess
Device(config)# access-list 10 deny any
```

This example shows how to send the SNMP traps to the host specified by the name myhost.cisco.com. The community string is defined as comaccess:

```
Device(config)# snmp-server enable traps
Device(config)# snmp-server host myhost.cisco.com comaccess snmp
```

This example shows how to enable the device to send all traps to the host myhost.cisco.com by using the community string public:

```
Device(config)# snmp-server enable traps
Device(config)# snmp-server host myhost.cisco.com public
```

You can verify your settings by entering the **show running-config** privileged EXEC command.

snmp-server manager

To start the Simple Network Management Protocol (SNMP) manager process, use the **snmp-server manager** command in global configuration mode. To stop the SNMP manager process, use the **no** form of this command.

snmp-server manager
no snmp-server manager

Command Default

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	The command was introduced.

Usage Guidelines

The SNMP manager process sends SNMP requests to agents and receives SNMP responses and notifications from agents. When the SNMP manager process is enabled, the router can query other SNMP agents and process incoming SNMP traps.

Most network security policies assume that routers will be accepting SNMP requests, sending SNMP responses, and sending SNMP notifications. With the SNMP manager functionality enabled, the router may also be sending SNMP requests, receiving SNMP responses, and receiving SNMP notifications. The security policy implementation may need to be updated prior to enabling this functionality.

SNMP requests are typically sent to UDP port 161. SNMP responses are typically sent from UDP port 161. SNMP notifications are typically sent to UDP port 162.

The following example shows how to enable the SNMP manager process:

```
Router(config)# snmp-server manager
```

Related Commands

Command	Description
show running-config	Displays the contents of the currently running configuration file or the configuration for a specific interface, or map class information.
show snmp user	Displays information on each SNMP username in the group username table.
snmp-server engineID	Displays the identification of the local SNMP engine and all remote engines that have been configured on the device.

snmp-server user

To configure a new user to a Simple Network Management Protocol (SNMP) group, use the **snmp-server user** command in global configuration mode. To remove a user from an SNMP group, use the **no** form of this command.

snmp-server user *username group-name* [**remote** *host* [**udp-port** *port*] [**vrf** *vrf-name*]] {**v1** | **v2c** | **v3** [**encrypted**] [**auth** {**md5** | **sha**} *auth-password*]} [**access** [**ipv6** *nacl*] [**priv** {**des** | **3des** | **aes** {**128** | **192** | **256**}} *privpassword*] {*acl-numberacl-name*}]
no snmp-server user *username group-name* [**remote** *host* [**udp-port** *port*] [**vrf** *vrf-name*]] {**v1** | **v2c** | **v3** [**encrypted**] [**auth** {**md5** | **sha**} *auth-password*]} [**access** [**ipv6** *nacl*] [**priv** {**des** | **3des** | **aes** {**128** | **192** | **256**}} *privpassword*] {*acl-numberacl-name*}]

Syntax Description

username	Name of the user on the host that connects to the agent.
group-name	Name of the group to which the user belongs.
remote	(Optional) Specifies a remote SNMP entity to which the user belongs, and the hostname or IPv6 address or IPv4 IP address of that entity. If both an IPv6 address and IPv4 IP address are being specified, the IPv6 host must be listed first.
host	(Optional) Name or IP address of the remote SNMP host.
udp-port	(Optional) Specifies the User Datagram Protocol (UDP) port number of the remote host.
port	(Optional) Integer value that identifies the UDP port. The default is 162.
vrf	(Optional) Specifies an instance of a routing table.
vrf-name	(Optional) Name of the Virtual Private Network (VPN) routing and forwarding (VRF) table to use for storing data.
v1	Specifies that SNMPv1 should be used.
v2c	Specifies that SNMPv2c should be used.
v3	Specifies that the SNMPv3 security model should be used. Allows the use of the **encrypted** keyword or **auth** keyword or both.
encrypted	(Optional) Specifies whether the password appears in encrypted format.
auth	(Optional) Specifies which authentication level should be used.
md5	(Optional) Specifies the HMAC-MD5-96 authentication level.
sha	(Optional) Specifies the HMAC-SHA-96 authentication level.
auth-password	(Optional) String (not to exceed 64 characters) that enables the agent to receive packets from the host.
access	(Optional) Specifies an Access Control List (ACL) to be associated with this SNMP user.
ipv6	(Optional) Specifies an IPv6 named access list to be associated with this SNMP user.

nacl	(Optional) Name of the ACL. IPv4, IPv6, or both IPv4 and IPv6 access lists may be specified. If both are specified, the IPv6 named access list must appear first in the statement.
priv	(Optional) Specifies the use of the User-based Security Model (USM) for SNMP version 3 for SNMP message level security.
des	(Optional) Specifies the use of the 56-bit Digital Encryption Standard (DES) algorithm for encryption.
3des	(Optional) Specifies the use of the 168-bit 3DES algorithm for encryption.
aes	(Optional) Specifies the use of the Advanced Encryption Standard (AES) algorithm for encryption.
128	(Optional) Specifies the use of a 128-bit AES algorithm for encryption.
192	(Optional) Specifies the use of a 192-bit AES algorithm for encryption.
256	(Optional) Specifies the use of a 256-bit AES algorithm for encryption.
privpassword	(Optional) String (not to exceed 64 characters) that specifies the privacy user password.
acl-number	(Optional) Integer in the range from 1 to 99 that specifies a standard access list of IP addresses.
acl-name	(Optional) String (not to exceed 64 characters) that is the name of a standard access list of IP addresses.

Command Default

See the table in the "Usage Guidelines" section for default behaviors for encryption, passwords, and access lists.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Fuji 16.8.1a	This command was introduced.

Usage Guidelines

To configure a remote user, specify the IP address or port number for the remote SNMP agent of the device where the user resides. Also, before you configure remote users for a particular agent, configure the SNMP engine ID, using the **snmp-server engineID** command with the **remote** keyword. The remote agent's SNMP engine ID is needed when computing the authentication and privacy digests from the password. If the remote engine ID is not configured first, the configuration command will fail.

For the *privpassword* and *auth-password*arguments, the minimum length is one character; the recommended length is at least eight characters, and should include both letters and numbers. The recommended maximum length is 64 characters.

The table below describes the default user characteristics for encryption, passwords, and access lists.

Table 8: snmp-server user Default Descriptions

Characteristic	Default
Access lists	Access from all IP access lists is permitted.
Encryption	Not present by default. The **encrypted** keyword is used to specify that the passwords are message digest algorithm 5 (MD5)digests and not text passwords.
Passwords	Assumed to be text strings.
Remote users	All users are assumed to be local to this SNMP engine unless you specify they are remote with the **remote** keyword.

SNMP passwords are localized using the SNMP engine ID of the authoritative SNMP engine. For informs, the authoritative SNMP agent is the remote agent. You need to configure the remote agent's SNMP engine ID in the SNMP database before you can send proxy requests or informs to it.

Note Changing the engine ID after configuring the SNMP user, does not allow to remove the user. To remove the user, you need to first reconfigure the SNMP user.

Working with Passwords and Digests

No default values exist for authentication or privacy algorithms when you configure the command. Also, no default passwords exist. The minimum length for a password is one character, although Cisco recommends using at least eight characters for security. The recommended maximum length of a password is 64 characters. If you forget a password, you cannot recover it and will need to reconfigure the user. You can specify either a plain-text password or a localized MD5 digest.

If you have the localized MD5 or Secure Hash Algorithm (SHA) digest, you can specify that string instead of the plain-text password. The digest should be formatted as aa:bb:cc:dd where aa, bb, and cc are hexadecimal values. Also, the digest should be exactly 16 octets long.

Examples

The following example shows how to add the user abcd to the SNMP server group named public. In this example, no access list is specified for the user, so the standard named access list applied to the group applies to the user.

```
Device(config)# snmp-server user abcd public v2c
```

The following example shows how to add the user abcd to the SNMP server group named public. In this example, access rules from the standard named access list qrst apply to the user.

```
Device(config)# snmp-server user abcd public v2c access qrst
```

In the following example, the plain-text password cisco123 is configured for the user abcd in the SNMP server group named public:

```
Device(config)# snmp-server user abcd public v3 auth md5 cisco123
```

When you enter a **show running-config** command, a line for this user will be displayed. To learn if this user has been added to the configuration, use the show snmp user command.

Note The **show running-config** command does not display any of the active SNMP users created in authPriv or authNoPriv mode, though it does display the users created in noAuthNoPriv mode. To display any active SNMPv3 users created in authPriv, authNoPrv, or noAuthNoPriv mode, use the **show snmp user** command.

If you have the localized MD5 or SHA digest, you can specify that string instead of the plain-text password. The digest should be formatted as aa:bb:cc:dd where aa, bb, and cc are hexadecimal values. Also, the digest should be exactly 16 octets long.

In the following example, the MD5 digest string is used instead of the plain-text password:

```
Device(config)# snmp-server user abcd public v3 encrypted auth md5
00:11:22:33:44:55:66:77:88:99:AA:BB:CC:DD:EE:FF
```

In the following example, the user abcd is removed from the SNMP server group named public:

```
Device(config)# no snmp-server user abcd public v2c
```

In the following example, the user abcd from the SNMP server group named public specifies the use of the 168-bit 3DES algorithm for privacy encryption with secure3des as the password.

```
Device(config)# snmp-server user abcd public priv v2c 3des secure3des
```

Related Commands

Command	Description
show running-config	Displays the contents of the currently running configuration file or the configuration for a specific interface, or map class information.
show snmp user	Displays information on each SNMP username in the group username table.
snmp-server engineID	Displays the identification of the local SNMP engine and all remote engines that have been configured on the device.

snmp-server view

To create or update a view entry, use the **snmp-server view** command in global configuration mode. To remove the specified Simple Network Management Protocol (SNMP) server view entry, use the **no**form of this command.

snmp-server view *view-name oid-tree* {**included** | **excluded**}
no snmp-server view *view-name*

Syntax Description

view-name	Label for the view record that you are updating or creating. The name is used to reference the record.
oid-tree	Object identifier of the ASN.1 subtree to be included or excluded from the view. To identify the subtree, specify a text string consisting of numbers, such as 1.3.6.2.4, or a word, such as system. Replace a single subidentifier with the asterisk (*) wildcard to specify a subtree family; for example 1.3.*.4.
included	Configures the OID (and subtree OIDs) specified in *oid-tree* argument to be included in the SNMP view.
excluded	Configures the OID (and subtree OIDs) specified in *oid-tree* argument to be explicitly excluded from the SNMP view.

Command Default

No view entry exists.

Command Modes

Global configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.8.1a	This command was introduced.

Usage Guidelines

Other SNMP commands require an SMP view as an argument. You use this command to create a view to be used as arguments for other commands.

Two standard predefined views can be used when a view is required, instead of defining a view. One is *everything*, which indicates that the user can see all objects. The other is *restricted,*which indicates that the user can see three groups: system, snmpStats, and snmpParties. The predefined views are described in RFC 1447.

The first **snmp-server** command that you enter enables SNMP on your routing device.

Examples

The following example creates a view that includes all objects in the MIB-II subtree:

```
snmp-server view mib2 mib-2 included
```

The following example creates a view that includes all objects in the MIB-II system group and all objects in the Cisco enterprise MIB:

```
snmp-server view root_view system included
snmp-server view root_view cisco included
```

The following example creates a view that includes all objects in the MIB-II system group except for sysServices (System 7) and all objects for interface 1 in the MIB-II interfaces group:

```
snmp-server view agon system included
snmp-server view agon system.7 excluded
snmp-server view agon ifEntry.*.1 included
```

In the following example, the USM, VACM, and Community MIBs are explicitly included in the view "test" with all other MIBs under the root parent "internet":

```
! -- include all MIBs under the parent tree "internet"
snmp-server view test internet included
! -- include snmpUsmMIB
snmp-server view test 1.3.6.1.6.3.15 included
! -- include snmpVacmMIB
snmp-server view test 1.3.6.1.6.3.16 included
! -- exclude snmpCommunityMIB
snmp-server view test 1.3.6.1.6.3.18 excluded
```

Related Commands

Command	Description
snmp-server community	Sets up the community access string to permit access to the SNMP protocol.
snmp-server manager	Starts the SNMP manager process.

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 Fuji 16.9.2	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 device 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 device to the destination system and you do not specify the source interface from which the source IP address is to be obtained, the device 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 device , but with different source IP addresses. When the destination system receives Flexible Netflow datagrams from the same device with different source IP addresses, the destination system treats the Flexible Netflow datagrams as if they were being sent from different devices . To avoid having the destination system treat the Flexible Netflow datagrams as if they were being sent from different devices, you must configure the destination system to aggregate the Flexible Netflow datagrams it receives from all of the possible source IP addresses in the device into a single Flexible Netflow flow.
- If your device 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 device 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:

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

socket

To specify the client socket and allow a TCL interpreter to connect via TCP over IPv4/IPv6 and open a TCP network connection use the **socket** comand in the TCL configuration mode.

socket myaddr *address* **myport** *port* **myvrf** *vrf-table-name host port*

Syntax Description

myaddr	Specifies domain name or numerical IP address of the client-side network interface required for the connection. Use this option especially if the client machine has multiple network interfaces.
myport	Specifies port number that is required for the client's connection.
myvrf	Specifies the vrf table name. If the vrf table is not configured, then the command will return a TCL_ERROR.

Command Default

Command Modes

TCL configuration mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	The **myvrf** keyword was introduced.

switchport mode access

To sets the interface as a nontrunking nontagged single-VLAN Ethernet interface , use the **switchport mode access** command in template configuration mode. Use the **no** form of this command to return to the default setting.

switchport mode access
no switchport mode access

Syntax Description

switchport mode access	Sets the interface as a nontrunking nontagged single-VLAN Ethernet interface.

Command Default

An access port can carry traffic in one VLAN only. By default, an access port carries traffic for VLAN1.

Command Modes

Template configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Examples

This example shows how to set a single-VLAN interface

```
Device(config-template)# switchport mode access
```

switchport voice vlan

To specify to forward all voice traffic through the specified VLAN, use the **switchport voice vlan** command in template configuration mode. Use the **no** form of this command to return to the default setting.

switchport voice vlan*vlan_id*
no switchport voice vlan

Syntax Description

switchport voice vlan*vlan_id*	Specifies to forward all voice traffic through the specified VLAN.

Command Default

You can specify a value from 1 to 4094.

Command Modes

Template configuration

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.2	This command was introduced.

Examples

This example shows how to specify to forward all voice traffic through the specified VLAN.

```
Device(config-template)# switchport voice vlan 20
```

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 Fuji 16.9.2	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.

The following example specifies a TTL of 15:

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

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 Fuji 16.9.2	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.

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

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

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 Fuji 16.9.2	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.

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

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

udp peek

To enable peeking into a UDP socket use the **udp_peek** command in the TCL configuration mode.

udp_peek *socket* **buffersize** *buffer-size*

Syntax Description

buffersize	Specifies the buffer size.

Command Default

Command Modes

TCL configuration mode

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.1	This command was introduced.