Cisco IOS Flexible NetFlow Command Reference

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cache (Flexible NetFlow) through match flow

cache (Flexible NetFlow)

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

cache {**entries** *number* | **timeout** {**active** *seconds* | **event transaction-end** | **inactive** *seconds* | **update** *seconds* | **synchronized** *interval* [**export-spread** [*spread-interval*]]} | **type** {**immediate** | **normal** | **permanent** | **synchronized**}}
no cache {**entries** | **timeout** {**active** | **event transaction-end** | **inactive** | **update** | **synchronized**} | **type** {**immediate** | **normal** | **permanent** | **synchronized**}}

Syntax Description		
entries *number*	Specifies the maximum number of entries in the flow monitor cache. The range is from 16 to 2000000.	
	Note On the Cisco ISR 4400 Series Integrated Services Routers, the range is from 16 to 1000000.	
timeout active *seconds*	Specifies the active flow timeout in seconds. The range is from 1 to 604800 (7 days). The default is 1800.	
timeout event transaction-end	Specifies that the record is generated and exported in the NetFlow cache at the end of a transaction.	
timeout inactive *seconds*	Specifies the inactive flow timeout in seconds. The range is from 1 to 604800 (7 days).The default is 15.	
timeout update *seconds*	Specifies the update timeout, in seconds, for a permanent flow cache. The range is from 1 to 604800 (7 days). The default is 1800.	
timeout synchronized *interval*	Specifies the synchronized interval timeout value. The range is from 1 to 300.	
export-spread	Enables export spreading.	
spread-interval	The export spreading interval in seconds. The valid period is 5 or 6.	
type	Specifies the type of the flow cache.	
immediate	Configures an immediate cache type. This cache type will age out every record as soon as it is created.	
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.	
permanent	Configures a permanent cache type. This cache type disables flow removal from the flow cache.	
synchronized	Configures a synchronized cache type.	

Command Default   The default Flexible NetFlow flow monitor flow cache parameters are used.

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

- Cache type: normal

- Maximum number of entries in the flow monitor cache: 4096

- Active flow timeout: 1800 seconds

- Inactive flow timeout: 15 seconds

- Update timeout for a permanent flow cache: 1800 seconds

Command Modes

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

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
Cisco IOS XE Release 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
Cisco IOS XE Release 3.4S	This command was modified. The **event transaction-end** keyword was added.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE with support for the **timeout** and **type normal** keywords only.
Cisco IOS XE Release 3.11S	This command was modified. The **export-spread** keyword was added. The **update** keyword was removed.

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 number of entries and 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.

If a cache is already active (that is, you have applied the flow monitor to at least one interface in the router), your changes to the record, cache type, and cache size parameters will not take effect until you either reboot the router or remove the flow monitor from every interface and then reapply it. Therefore whenever possible you should customize the record, cache type, and cache size parameters for the cache before you apply the flow monitor to an interface. You can modify the timers, flow exporters, and statistics parameters for a cache while the cache is active.

cache entries

This command controls the size of the cache. Cache size should be based on a number of factors, including the number of flows expected, the time the flows are expected to last (based on the configured key fields and the traffic), and the timeout values configured for the cache. The size should be large enough to minimize emergency expiry.

Emergency expiry is caused by the Flexible NetFlow cache becoming full. When the Flexible NetFlow cache becomes full, the router performs "emergency expiry" where a number of flows are immediately aged, expired from the Flexible NetFlow cache, and exported in order to free up space for more flows.

For a permanent cache (flows never expire), the number of entries should be large enough to accommodate the number of flows expected for the entire duration of the cache entries. If more flows occur than there are cache entries, the excess flows are not recorded in the cache.

For an immediate cache (flows expire immediately), the number of entries simply controls the amount of history that is available for previously seen packets.

cache timeout active

This 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.

cache timeout event transaction-end

To use this command, you must configure the **match connection transaction id** command and the **match application name** command for the flow record. This command causes the record to be generated and exported in the NetFlow cache at the end of a transaction. A transaction is a set of logical exchanges between endpoints. There is normally one transaction within a flow.

cache timeout inactive

This command 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.

cache timeout update

This 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).

cache timeout synchronized *interval* [**export-spread** [*spread-interval*]]

This command configures export spreading on a synchronized cache. As asynchronous monitors need to aggregate the data in a few seconds, you can enable and configure export spreading only when you configure the synchronized interval timeout value to more than 10 seconds. Export spreading might start a couple of seconds after the interval ends in order to complete the aggregation. No export spreading option is visible on the CLI if the synchronized interval timeout value is lower than 10 seconds. The default export spread interval is 30 seconds.

cache type immediate

This command specifies the immediate cache type. This type of cache will age out every record as soon as it is created, with the result that every flow contains just one packet. The commands that display the cache contents will provide a history of the packets seen.

The use of this cache type is appropriate when very small flows are expected and a minimum amount of latency between analyzing a packet and exporting a report is desired. We recommend using this command when you are sampling packet chunks because the number of packets per flow is typically very low.

⚠️

Caution   This command may result in a large amount of export data that can overload low speed links and overwhelm any systems to which you are exporting. We recommended that you configure sampling to reduce the number of packets seen.

📝

Note   The timeout settings have no effect for the immediate cache type.

cache type normal

This 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.

cache type permanent

This command specifies the permanent cache type. This type of cache never ages out any flows. This cache type is useful when the number of flows you expect to see has a limit and there is a need to keep long-term statistics on the router. For example, if the only key field is IP TOS, a limit of 256 flows can be seen, so to monitor the long-term usage of the IP TOS field, a permanent cache can be used. Update messages are exported via any exporters configured for the monitor associated with this cache in accordance with the **timeout update** *seconds* setting.

📝

Note   When a cache becomes full, new flows will not be monitored. If this occurs, a "Flows not added" statistic will appear in the cache statistics.

📝

Note   A permanent cache uses update counters rather than delta counters. This means that when a flow is exported, the counters represent the totals seen for the full lifetime of the flow and not the additional packets and bytes seen since the last export was sent.

Examples   The following example shows how to configure the number of entries for the flow monitor cache:

```
Device(config)# flow monitor FLOW-MONITOR-1
Device(config-flow-monitor)# cache entries 16
```

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 3000
```

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 enable and configure export spreading where the synchronized interval timeout value is 12 seconds and the export spread interval is 5 seconds:

```
Device(config)# flow monitor FLOW-MONITOR-1
Device(config-flow-monitor)# cache type synchronized
Device(config-flow-monitor)# cache timeout synchronized 12 export-spread 5
```

The following example shows how to configure a normal cache:

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

The following example shows how to configure a permanent cache:

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

The following example shows how to configure an immediate cache:

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

Related Commands

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

clear flow exporter

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

clear flow exporter {**name** *exporter-name* **statistics** | **statistics**}

Syntax Description

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

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Examples

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

```
Router# clear flow exporter statistics
```

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

```
Router# clear flow exporter name FLOW-EXPORTER-1 statistics
```

Related Commands

Command	Description
debug flow exporter	Enables debugging output for flow exporters.

clear flow monitor

To clear a Flexible NetFlow flow monitor, 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**] | **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
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines

cache

This keyword 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.

force-export

This keyword removes all entries from the flow monitor cache and exports them via all flow exporters assigned to the flow monitor. This action can result in a short-term increase in CPU usage. Use with caution.

Note The statistics for the cleared cache entries are maintained.

statistics

This keyword clears the statistics for this flow monitor.

Note The "Current entries" statistic will not be cleared because this is an indicator of how many entries are in the cache and the cache is not cleared with this command.

Examples

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

```
Router# 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:

```
Router# 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:

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

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

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

Related Commands

Command	Description
debug flow monitor	Enables debugging output for flow monitors.

clear sampler

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

clear sampler [**name**] [*sampler-name*]

Syntax Description

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

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Examples

The following example clears the sampler statistics for all flow samplers configured on the router:

```
Router# clear sampler
```

The following example clears the sampler statistics for the flow sampler named SAMPLER-1:

```
Router# clear sampler name SAMPLER-1
```

Related Commands

Command	Description
debug sampler	Enables debugging output for flow samplers.

collect application http

To configure one of the HTTP application fields as a nonkey field for a flow record, use the **collect application http host** command in flow record configuration mode. To disable the use the HTTP application fields as a key field for a flow record, use the **no** form of this command.

collect application http {**host** | **uri statistics**}
no collect application http {**host** | **uri statistics**}

Syntax Description This command has no arguments or keywords.

Command Default The HTTP application fields are not configured as a nonkey field.

Command Modes Flow record configuration (config-flow-record)

Command History

Release	Modification
15.2(4)S	This command was introduced.
Cisco IOS XE Release 3.7S	This command was integrated into Cisco IOS XE Release 3.7S.
15.2(4)M2	This command was integrated into Cisco IOS Release 15.2(4)M2 for MACE.
15.3(1)T	This command was integrated into Cisco IOS Release 15.3(1)T for MACE.

Usage Guidelines This command can be used with Flexible NetFlow, MACE (Measurement, Aggregation, and Correlation Engine), and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for all three products, here we refer to the command mode for these products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples The following example configures the HTTP application host as a nonkey field for Flexible Netflow:

```
Router(config)# flow record RECORD-1
Router(config-flow-record)# collect application http host
```

Cisco Performance Monitor in Cisco IOS Release 15.2(4)S and Cisco IOS XE Release 3.7S

The following example configures the HTTP application host as a nonkey field for Performance Monitor:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect application http host
```

MACE in Cisco IOS Release 15.2(4)M2 and Cisco IOS Release 15.3(1)T

The following example configures the HTTP application URI statistics as a nonkey field for Performance Monitor:

```
Router(config)# flow record type mace RECORD-1
Router(config-flow-record)# collect application http uri statistics
```

Related Commands	Command	Description
	flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
	flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.
	flow record type mace	Creates a flow record, and enters MACE flow record configuration mode.

collect application name

To configure the use of the application name as a nonkey field for a flow record, use the **collect application name** command in flow record configuration mode. To disable the use of the application name as a nonkey field for a flow record, use the **no** form of this command.

collect application name
no collect application name

Syntax Description

This command has no arguments or keywords.

Command Default

The application name is not configured as a non-key field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
15.0(1)M	This command was introduced.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.
15.2(3)T	This command was integrated into Cisco IOS Release 15.2(3)T for Cisco Performance Monitor.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples

The following example configures the application name as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect application name
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the application name as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect application name
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.
match application name	Configures the use of application name as a key field for a Flexible NetFlow flow record.

collect application nntp

To configure the NNTP application group name field as a nonkey field for a flow record, use the **collect application nntp group-name** command in flow record configuration mode. To disable the use the application fields as a key field for a flow record, use the **no** form of this command.

collect application nntp group-name
no collect application nntp group-name

Syntax Description

This command has no arguments or keywords.

Command Default

The application version field is not configured as a nonkey field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
15.2(4)S	This command was introduced.
Cisco IOS XE Release 3.7S	This command was integrated into Cisco IOS XE Release 3.7S.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples

The following example configures the NNTP application group name as a nonkey field for Flexible Netflow:

```
Router(config)# flow record RECORD-1
Router(config-flow-record)# collect application nntp group-name
```

Cisco Performance Monitor in Cisco IOS Release 15.2(4)S and Cisco IOS XE Release 3.7S

The following example configures the NNTP application group name as a nonkey field for Performance Monitor:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect application nntp group-name
```

	Command	Description
Related Commands	**flow record**	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
	flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect application pop3

To configure the POP3 application server field as a nonkey field for a flow record, use the **collect application pop3 server** command in flow record configuration mode. To disable the use the application fields as a key field for a flow record, use the **no** form of this command.

collect application pop3 server
no collect application pop3 server

Syntax Description   This command has no arguments or keywords.

Command Default   The application version field is not configured as a nonkey field.

Command Modes   Flow record configuration (config-flow-record)

Command History

Release	Modification
Cisco IOS XE Release 3.7S	This command was introduced.

Usage Guidelines   The fields collected by this command can only extracted using the IPFIX export protocol.

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples   The following example configures the POP3 application server as a nonkey field for Flexible Netflow:

```
Router(config)# flow record RECORD-1
Router(config-flow-record)# collect application pop3 server
```

Cisco Performance Monitor in Cisco IOS Release 15.2(4)S and Cisco IOS XE Release 3.7S

The following example configures the POP3 application server as a nonkey field for Performance Monitor:

```
Router(config)# flow record type performance-monitor RECORD-1
```

```
Router(config-flow-record)# collect application pop3 server
```

	Command	Description
Related Commands	**flow record**	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
	flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect application rtsp

To configure the RTSP application hostname field as a nonkey field for a flow record, use the **collect application rtsp host-name** command in flow record configuration mode. To disable the use the application fields as a key field for a flow record, use the **no** form of this command.

collect application rtsp host-name
no collect application rtsp host-name

Syntax Description

This command has no arguments or keywords.

Command Default

The application version field is not configured as a nonkey field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
Cisco IOS XE Release 3.7S	This command was introduced.

Usage Guidelines

The fields collected by this command can only extracted using the IPFIX export protocol.

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples

The following example configures the RTSP application hostname as a nonkey field for Flexible Netflow:

```
Router(config)# flow record RECORD-1
Router(config-flow-record)# collect application rtsp host-name
```

Cisco Performance Monitor in Cisco IOS Release 15.2(4)S and Cisco IOS XE Release 3.7S

The following example configures the RTSP application hostname as a nonkey field for Performance Monitor:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect application rtsp host-name
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect application sip

To configure the SIP application destination or source field as a nonkey field for a flow record, use the **collect application sip** command in flow record configuration mode. To disable the use the application fields as a key field for a flow record, use the **no** form of this command.

collect application sip {**destination** | **source**}
no collect application sip {**destination** | **source**}

Syntax Description

This command has no arguments or keywords.

Command Default

The application version field is not configured as a nonkey field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
Cisco IOS XE Release 3.7S	This command was introduced.

Usage Guidelines

The fields collected by this command can only extracted using the IPFIX export protocol.

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples

The following example configures the SIP application source as a nonkey field for Flexible Netflow:

```
Router(config)# flow record RECORD-1
Router(config-flow-record)# collect application sip source
```

Cisco Performance Monitor in Cisco IOS Release 15.2(4)S and Cisco IOS XE Release 3.7S

The following example configures the application SMTP hostname as a nonkey field for Performance Monitor:

```
Router(config)# flow record type performance-monitor RECORD-1
```

```
Router(config-flow-record)# collect application sip source
```

Related Commands	Command	Description
	flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
	flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect application smtp

To configure the SMTP application server or sender field as a nonkey field for a flow record, use the **collect application smtp** command in flow record configuration mode. To disable the use the application fields as a key field for a flow record, use the **no** form of this command.

collect application smtp {**sender** | **server**}
no collect application smtp {**sender** | **server**}

Syntax Description   This command has no arguments or keywords.

Command Default   The application version field is not configured as a nonkey field.

Command Modes   Flow record configuration (config-flow-record)

Command History

Release	Modification
Cisco IOS XE Release 3.7S	This command was introduced.

Usage Guidelines   The fields collected by this command can only extracted using the IPFIX export protocol.

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples   The following example configures the SMTP application server as a nonkey field for Flexible Netflow:

```
Router(config)# flow record RECORD-1
Router(config-flow-record)# collect application smtp server
```

Cisco Performance Monitor in Cisco IOS Release 15.2(4)S and Cisco IOS XE Release 3.7S

The following example configures the SMTP application server as a nonkey field for Performance Monitor:

```
Router(config)# flow record type performance-monitor RECORD-1
```

```
Router(config-flow-record)# collect application smtp server
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect connection

To configure various connection information fields as a nonkey field for a flow record, use the **collect connection** command in flow record configuration mode. To disable the use of the connection information fields as a nonkey field for a flow record, use the **no** form of this command.

collect connection {**initiator** | **new-translations** | **sum-duration**}
no collect connection {**initiator** | **new-translations** | **sum-duration**}

Syntax Description

initiator	Configures the connection initiator as a nonkey field.
new-translations	Configures the number of TCP or UDP connections which were opened during an observation period as a nonkey field.
sum-duration	Configures the total time in seconds for all of the TCP or UDP connections which were in use during an observation period as a nonkey field.

Command Default

Connection information fields are not configured as a nonkey field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
Cisco IOS XE Release 3.4S	This command was introduced.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

The **initiator** keyword provides the following information about the direction of the flow.

- 0x00=undefined

- 0x01=initiator - the flow source is initiator of the connection.

- 0x02=reverseInitiator - the flow destination is the initiator of the connection.

For the **new-translations** and **sum-duration** keywords, the observation period can be specified by the start and end timestamps for the flow.

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

Examples

The following example configures information about the connection initiator as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect connection initiator
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures information about the connection initiator as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect connection initiator
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect counter

To configure the number of bytes or packets in a flow as a nonkey field for a flow record, use the **collect counter** command in Flexible NetFLow flow record configuration mode. To disable the use of the number of bytes or packets in a flow (counters) as a nonkey field for a flow record, use the **no** form of this command.

collect counter {**bytes** [{**long** | **replicated** [**long**] | **squared long**}] | **packets** [{**long** | **replicated** [**long**]}]}
no collect counter {**bytes** [{**long** | **replicated** [**long**] | **squared long**}] | **packets** [{**long** | **replicated** [**long**]}]}

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE
collect counter {**bytes** [{**long** | **rate**}] | **packets** [{**dropped** [**long**] | **long**}]}
no collect counter {**bytes** [{**long** | **rate**}] | **packets** [{**dropped** [**long**] | **long**}]}

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
collect counter {**bytes** [**long**] | **packets** [**long**]}
no collect counter {**bytes** [**long**] | **packets** [**long**]}

Cisco IOS XE Release 3.2SE
no collect counter {**bytes** {**layer2 long** | **long**} | **packets long**}
no collect counter {**bytes** {**layer2 long** | **long**} | **packets long**}

Syntax Description

bytes	Configures the number of bytes seen in a flow as a nonkey field and enables collecting the total number of bytes from the flow.
layer 2 long	Enables collecting the total number of Layer 2 bytes or packets from the flow using a 64-bit counter rather than a 32-bit counter. For Cisco IOS XE Release 3.2SE, use the **layer 2 long** keywords rather than the **long** keyword.
long	(Optional) Enables collecting the total number of bytes or packets from the flow using a 64-bit counter rather than a 32-bit counter. For Cisco IOS XE Release 3.2SE, use the **layer 2 long** keywords rather than the **long** keyword.
replicated	Total number of replicated (multicast) IPv4 packets.
squared long	(Optional) Enables collecting the total of the square of the number of bytes from the flow.
packets	Configures the number of packets seen in a flow as a nonkey field and enables collecting the total number of packets from the flow.
rate	Configures the byte rate counter as a nonkey field.
dropped	Configures the dropped packet counter as a nonkey field.

Command Default   The number of bytes or packets in a flow is not configured as a nonkey field.

Command Modes

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

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this Cisco was implemented on the 12000 series routers.
12.2(33)SRC	This command was modified. Support for this Cisco was implemented on the Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.
12.4(22)T	This command was modified. The **replicated** keyword was added.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
15.1(3)T	This command was modified for the Cisco Performance Monitor. The **replicated** and **squared long** keywords were removed and the **rate** and **dropped** keywords were added.
12.2(58)SE	This command was modified for the Cisco Performance Monitor. The **replicated** and **squared long** keywords were removed and the **rate** and **dropped** keywords were added.
12.2(50)SY	This command was modified. The **replicated** and **squared long** keywords were removed.
Cisco IOS XE Release 3.2SE	This command was modified. The **layer 2 long** keyword combination was added. The **replicated** and **squared long** keywords were removed.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode. For Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode. Here we refer to them both as flow record configuration mode.

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

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE

The **rate** and **dropped** keywords were added and the **replicated** and **squared long** keywords were removed. You must first enter the **flow record type performance-monitor** command.

collect counter bytes

This command configures a 32-bit counter for the number of bytes seen in a flow.

collect counter packets

This command configures a 32-bit counter that is incremented for each packet seen in the flow. For extremely long flows it is possible for this counter to restart at 0 (wrap) when it reaches the limit of approximately 4

billion packets. On detection of a situation that would cause this counter to restart at 0, a flow monitor with a normal cache type exports the flow and starts a new flow.

collect counter packets long

This 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.

collect counter bytes squared long

This counter can be used in conjunction with the byte and packet counters in order to calculate the variance of the packet sizes. Its value is derived from squaring each of the packet sizes in the flow and adding the results. This value can be used as part of a standard variance function.

The variance and standard deviation of the packet sizes for the flow can be calculated with the following formulas:

cbs: value from the **counter bytes squared** field

pkts: value from the **counter packets** field

bytes: value from the **counter bytes** field

Variance = (cbs/pkts) - (bytes/pkts)2

Standard deviation = square root of Variance

Example 1:

Packet sizes of the flow: 100, 100, 100, 100

Counter packets: 4

Counter bytes: 400, mean packet size = 100

Counter bytes squared: 40,000

Variance = (40,000/4) - (400/4)2 = 0

Standard Deviation = 0

Size = 100 +/- 0

Example 2:

Packet sizes of the flow: 50, 150, 50, 150

Counter packets: 4

Counter bytes: 400, mean packet size = 100

Counter bytes squared: 50,000

Variance = (50,000/4) - (400/4)2 = 2500

Standard deviation = 50

Size = 100 +/- 50

Examples

The following example configures the total number of bytes in the flows as a nonkey field:

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

The following example configures the total number of bytes in the flows as a nonkey field using a 64-bit counter:

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

The following example configures the sum of the number of bytes of each packet in the flow squared as a nonkey field:

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

The following example configures the total number of packets from the flows as a nonkey field:

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

The following example configures the total number of packets from the flows as a nonkey field using a 64-bit counter:

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

The following example configures the total number of packets from the flows as a nonkey field using a 64-bit counter:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect counter packets long
```

Related Commands

Command	Description
flow record	Creates a flow record for Flexible NetFlow.
flow record type performance-monitor	Creates a flow record for Performance Monitor.

collect datalink dot1q vlan

To configure the 802.1Q (dot1q) VLAN ID as a non-key field for a Flexible NetFlow flow record, use the **collectdatalinkdot1qvlan** command in Flexible NetFlow flow record configuration mode. To disable the use of the 802.1Q VLAN ID value as a nonkey field for a Flexible NetFlow flow record, use the **no** form of this command.

collect datalink dot1q vlan {input | output}
no collect datalink dot1q vlan {input | output}

Syntax Description	input	Configures the VLAN ID of traffic being received by the router as a nonkey field.
	output	Configures the VLAN ID of traffic being transmitted by the router as a nonkey field.

Command Default

The 802.1Q VLAN ID is not configured as a nonkey field.

Command Modes

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

Command History	Release	Modification
	12.4(22)T	This command was introduced.
	12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.

Usage Guidelines

The **input** and **output** keywords of the **collectdatalinkdot1qvlan** command are used to specify the observation point that is used by the **collectdatalinkdot1qvlan** command to capture the 802.1q VLAN IDs from network traffic. For example, when you configure a flow record with the **collectdatalinkdot1qvlaninput** command to monitor the simulated denial of service (DoS) attack in the figure below and apply the flow monitor to which the flow record is assigned in either input (ingress) mode on interface Ethernet 0/0.1 on R3 or output (egress) mode on interface Ethernet 1/0.1 on R3, the observation point is always Ethernet 0/0.1 on R3. The 802.1q VLAN ID that is collected is 5.

Figure 4: Simulated DoS Attack (a)
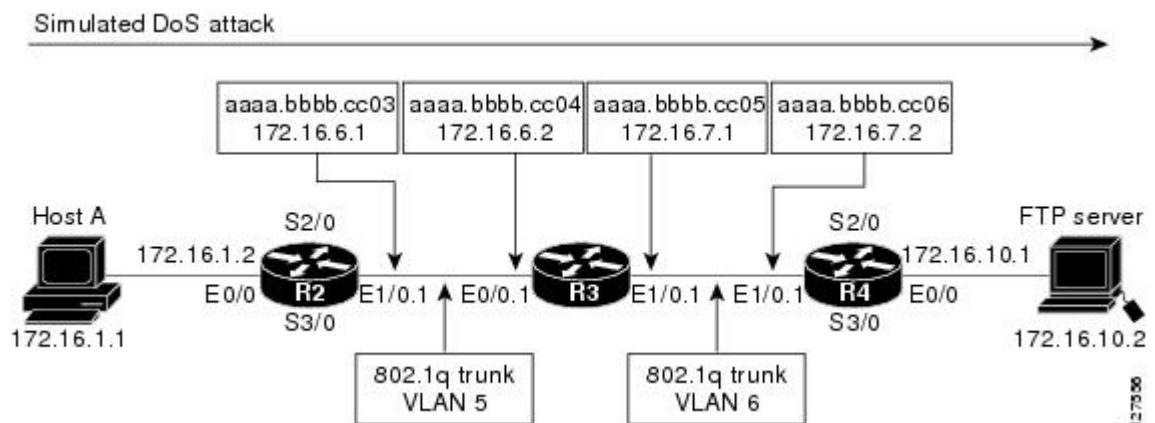
The observation point of **collect** commands that do not have the input and/or output keywords is always the interface to which the flow monitor that contains the flow record with the **collect** commands is applied.

Examples

The following example configures the 802.1Q VLAN ID of traffic being received by the router as a nonkey field for a Flexible NetFlow flow record:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect datalink dot1q vlan input
```

Related Commands

Command	Description
flow record	Creates a flow record.

collect datalink mac

To configure the use of MAC addresses as a nonkey field for a Flexible NetFlow flow record, use the **collectdatalinkmac** command in Flexible NetFlow flow record configuration mode. To disable the use of Layer 2 MAC addresses as a non-key field for a Flexible NetFlow flow record, use the **no** form of this command.

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

Syntax Description

destination address	Configures the use of the destination MAC address as a non-key field.
source address	Configures the use of the source MAC address as a non-key field.
input	Packets received by the router.
output	Packets transmitted by the router.

Command Default

MAC addresses are not configured as a nonkey field.

Command Modes

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

Command History

Release	Modification
12.4(22)T	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was integrated into 15.2(2)T without the **destination** keyword for Cisco Performance Monitor.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor**command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

The **input** and **output** keywords of the **collectdatalinkmac** command are used to specify the observation point that is used by the **collectdatalinkmac** command to capture the MAC addressees from network traffic. For example, when you configure a flow record with the **collectdatalinkmacdestinationaddressinput**command

to monitor the simulated denial of service (DoS) attack in the figure below and apply the flow monitor to which the flow record is assigned in either input (ingress) mode on interface Ethernet 0/0.1 on R3 or output (egress) mode on interface Ethernet 1/0.1 on R3, the observation point is always Ethernet 0/0.1 on R3. The destination MAC address that is collected is aaaa.bbbb.cc04.

Figure 5: Simulated DoS Attack (b)

When the destination output mac address is configured, the value is the destination mac address of the output packet, even if the monitor the flow record is applied to is input only.

When the destination input mac address is configured, the value is the destination mac address of the input packet, even if the monitor the flow record is applied to is output only.

When the source output mac address is configured, the value is the source mac address of the output packet, even if the monitor the flow record is applied to is input only.

When the source input mac address is configured, the value is the source mac address of the input packet, even if the monitor the flow record is applied to is output only.

Examples

The following example configures the use of the destination MAC address of packets that are received by the router as a nonkey field for a Flexible NetFlow flow record:

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

The following example configures the use of the source MAC addresses of packets that are transmitted by the router as a nonkey field for a Flexible NetFlow flow record:

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

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T

The following example configures the use of the source MAC addresses of packets that are transmitted by the router as a nonkey field for a Performance Monitor flow record: :

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect datalink mac source address output
```

Related Commands	Command	Description
	flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
	flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect flow

To configure the flow direction, the flow sampler ID number, or reason why the flow ended as a nonkey field for a flow record, use the **collect flow** command in flow record configuration mode. To disable the use of the flow direction and the flow sampler ID number as a nonkey field for a flow record, use the **no** form of this command.

collect flow {**direction** | **sampler**}
no collect flow {**direction** | **sampler**}

Cisco IOS Release 15.1(4)M1
collect flow direction
no collect flow direction

Syntax Description

direction	Configures the flow direction as a nonkey field and enables the collection of the direction in which the flow was monitored.
sampler	Configures the flow sampler ID as a nonkey field and enables the collection of the ID of the sampler that is assigned to the flow monitor.

Command Default

The flow direction and the flow sampler ID number are not configured as nonkey fields.

Command Modes

flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	Support for this command was added for Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.
15.1(4)M1	This command was integrated into Cisco IOS Release 15.1(4)M1 with only the **direction** keyword.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode. For Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode. Here we refer to them both as flow record configuration mode.

The Flexible NetFlow and Performance Monitor **collect** commands are used to configure nonkey fields for the flow monitor record and to enable capturing the values in the fields for the flow created with the record.

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

collect flow direction

This field indicates the direction of the flow. This is of most use 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 field may also be used to match up pairs of flows in the exported data when the two flows are flowing in opposite directions.

collect flow sampler

This field contains the ID of the flow sampler used to monitor the flow. This is useful when more than one flow sampler is being used with different sampling rates. The flow exporter **option sampler-table** command exports options records with mappings of the flow sampler ID to sampling rate so the collector can calculate the scaled counters for each flow.

Examples

The following example configures the ID of the flow sampler that is assigned to the flow as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect flow sampler
```

Cisco Performance Monitor in Cisco IOS Release 15.1(4)M1

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

```
Router(config)# flow record type performance-monitor FLOW-RECORD-1
Router(config-flow-record)# collect flow direction
```

Related Commands

Command	Description
flow exporter	Creates a flow exporter
flow record	Creates a flow record for Flexible NetFlow.
flow record type performance-monitor	Creates a flow record for Performance Monitor.

collect interface

To configure the input and output interface as a nonkey 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 nonkey field for a flow record, use the **no** form of this command.

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

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
collect interface {**input** [**physical**] | **output**} [**snmp**]
no collect interface {**input** [**physical**] | **output**} [**snmp**]

Syntax Description	input	Configures the input interface as a nonkey field and enables collecting the input interface from the flows.
	output	Configures the output interface as a nonkey field and enables collecting the output interface from the flows.

Command Default   The input and output interface is not configured as a nonkey field.

Command Modes

flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was integrated into Cisco IOS Release 12.2(33)SRC and implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.
15.1(3)T	This command was integrated into Cisco IOS Release 15.1(3)T for Cisco Performance Monitor.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE for Cisco Performance Monitor.
12.2(50)SY	This command was modified. The **physical** and **snmp**keywords were added in Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode. For Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode. Here we refer to them both as flow record configuration mode.

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

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE

You must first enter the**flowrecordtypeperformance-monitor** command**.**

Examples

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

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

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

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

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE

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

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect interface input
```

Related Commands

Command	Description
flow record	Creates a flow record for Flexible NetFlow.
flow record type performance-monitor	Creates a flow record for Performance Monitor.

collect ipv4

To configure one or more of the IPv4 fields as a nonkey field for a flow record, use the **collectipv4** command in flow record configuration mode. To disable the use of one or more of the IPv4 fields as a nonkey field for a flow record, use the **no** form of this command.

collect ipv4 {**dscp** | **header-length** | **id** | **option map** | **precedence** | **protocol** | **tos** | **version**}
no collect ipv4 {**dscp** | **header-length** | **id** | **option map** | **precedence** | **protocol** | **tos** | **version**}

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE
collect ipv4 dscp
no collect ipv4 dscp

Syntax Description

dscp	Configures the differentiated services code point (DCSP) field as a nonkey field and enables collecting the value in the IPv4 DSCP type of service (ToS) fields from the flows.
header-length	Configures the IPv4 header length flag as a nonkey field and enables collecting the value in the IPv4 header length (in 32-bit words) field from the flows.
id	Configures the IPv4 ID flag as a nonkey field and enables collecting the value in the IPv4 ID field from the flows.
option map	Configures the IPv4 options flag as a nonkey field and enables collecting the value in the bitmap representing which IPv4 options have been seen in the options field from the flows.
precedence	Configures the IPv4 precedence flag as a nonkey field and enables collecting the value in the IPv4 precedence (part of ToS) field from the flows.
protocol	Configures the IPv4 payload protocol field as a nonkey field and enables collecting the IPv4 value of the payload protocol field for the payload in the flows
tos	Configures the ToS field as a nonkey field and enables collecting the value in the IPv4 ToS field from the flows.
version	Configures the version field as a nonkey field and enables collecting the value in the IPv4 version field from the flows.

Command Default The IPv4 fields are not configured as a nonkey field.

Command Modes

flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.

Release	Modification
12.2(33)SRC	This command was integrated into Cisco IOS Release 12.2(33)SRC and implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.
15.1(3)T	This command was integrated into Cisco IOS Release 15.1(3)T for Cisco Performance Monitor with only the **dscp** keyword.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE for Cisco Performance Monitor with only the **dscp** keyword.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode. For Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode. Here we refer to them both as flow record configuration mode.

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

Note Some of the keywords of the **collectipv4** command are documented as separate commands. All of the keywords for the **collectipv4** command that are documented separately start with **collectipv4**. For example, for information about configuring the IPv4 time-to-live (TTL) field as a nonkey field and collecting its value for a flow record, refer to the **collectipv4ttl** command.

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE

Only the the **dscp** keyword is available. You must first enter the**flowrecordtypeperformance-monitor** command**.**

Examples

The following example configures the DSCP field as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect ipv4 dscp
```

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE

The following example configures the DSCP field as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect ipv4 dscp
```

	Command	Description
Related Commands	**flow record**	Creates a flow record for Flexible NetFlow.
	flow record type performance-monitor	Creates a flow record for Performance Monitor.

collect ipv4 destination

To configure the IPv4 destination address as a nonkey field for a flow record, use the **collectipv4destination** command in flow record configuration mode. To disable the use of an IPv4 destination address field as a nonkey field for a flow record, use the **no** form of this command.

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

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE
collect ipv4 destination mask [{**minimum-mask** *mask*}]
no collect ipv4 destination mask [{**minimum-mask** *mask*}]

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
collect ipv4 destination {**mask** | **prefix**}
no collect ipv4 destination {**mask** | **prefix**}

Syntax Description		
address		Configures the IPv4 destination address as a nonkey field and enables collecting the value of the IPv4 destination address from the flows.
mask		Configures the IPv4 destination address mask as a nonkey field and enables collecting the value of the IPv4 destination address mask from the flows.
prefix		Configures the prefix for the IPv4 destination address as a nonkey field and enables collecting the value of the IPv4 destination address 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 address is not configured as a nonkey field.

Command Modes

flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was integrated into Cisco IOS Release 12.2(33)SRC and implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.
15.1(3)T	This command was integrated into Cisco IOS Release 15.1(3)T for Cisco Performance Monitor with only the **mask**and**minimum-mask**keywords.

Release	Modification
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE for Cisco Performance Monitor with only the **mask**and**minimum-mask**keywords.
12.2(50)SY	This command was modified. The **address**and **minimum-mask** keywords were not supported in Cisco IOS Release 12.2(50)SY.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode. For Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode. Here we refer to them both as flow record configuration mode.

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

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE

Only the **mask**and**minimum-mask**keywords are available. You must first enter the**flowrecordtypeperformance-monitor** command**.**

Examples

The following example configures the IPv4 destination address prefix from the flows that have a prefix of 16 bits as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect ipv4 destination prefix minimum-mask 16
```

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE

The following example configures the IPv4 destination address prefix from the flows that have a prefix of 16 bits as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect ipv4 destination prefix minimum-mask 16
```

Related Commands

Command	Description
flow record	Creates a flow record for Flexible NetFlow.
flow record type performance-monitor	Creates a flow record for Performance Monitor.

collect ipv4 fragmentation

To configure the IPv4 fragmentation flags and the IPv4 fragmentation offset as a nonkey field for a flow record, use the **collect ipv4 fragmentation** command in flow record configuration mode. To disable the use of the IPv4 fragmentation flags and the IPv4 fragmentation offset as a nonkey field for a flow record, use the **no** form of this command.

collect ipv4 fragmentation {flags | offset}
no collect ipv4 fragmentation {flags | offset}

Syntax Description

flags	Configures the IPv4 fragmentation flags as a nonkey field and enables collecting the value in the IPv4 fragmentation flag fields from the flows.
offset	Configures the IPv4 fragmentation offset value as a nonkey field and enables collecting the value in the IPv4 fragmentation offset field from the flows.

Command Default   The IPv4 fragmentation flags and the IPv4 fragmentation offset are not configured as nonkey fields.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	Support for this command was added for Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.

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

collect ipv4 fragmentation flags

This field collects the "don't fragment" and "more fragments" flags.

Bit 0: reserved, must be zero.

Bit 1: (DF) 0 = May Fragment, 1 = Don't Fragment

Bit 2: (MF) 0 = Last Fragment, 1 = More Fragments

Bits 3-7: (DC) Don't Care, value is irrelevant

```
  0   1   2   3   4   5   6   7
+---+---+---+---+---+---+---+---+
|   | D | M | D | D | D | D | D |
| 0 | F | F | C | C | C | C | C |
+---+---+---+---+---+---+---+---+
```

For more information on IPv4 fragmentation flags, see RFC 791 *Internet Protocol* at the following URL: http://www.ietf.org/rfc/rfc791.txt .

Examples

The following example configures the IPv4 fragmentation flags as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect ipv4 fragmentation flags
```

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE

The following example configures the IPv4 fragmentation flags as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect ipv4 fragmentation flags
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect ipv4 section

To configure a section of an IPv4 packet as a nonkey field for a flow record, use the **collect ipv4 section** command in flow record configuration mode. To disable the use of a section of an IPv4 packet as a nonkey field for a flow record, use the **no** form of this command.

collect ipv4 section {**header size** *header-size* | **payload size** *payload-size*}
no collect ipv4 section {**header size** *header-size* | **payload size** *payload-size*}

Syntax Description

header size *header-size*	Configures the number of bytes of raw data starting at the IPv4 header to use as a nonkey field, and enables collecting the value in the raw data from the flows. Range: 1 to 1200.
payload size *payload-size*	Configures the number of bytes of raw data starting at the IPv4 payload to use as a nonkey field, and enables collecting the value in the raw data from the flows. Range: 1 to 1200.

Command Default

A section of an IPv4 packet is not configured as a nonkey field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	Support for this command was added for Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.

Usage Guidelines

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

It is recommended that you configure both **header size** and **payload size** so that you know how much data is going to be captured.

collect ipv4 section header

This command causes the first IPv4 header to be copied into the flow record for this flow. Only the configured size in bytes will be copied and part of the payload will also be captured if the configured size is larger than the size of the header.

✎

Note   This command can result in large records which use a lot of router memory and export bandwidth.

collect ipv4 section payload

This command results in a copy of the first IPv4 payload being put into the flow record for this flow. Only the configured size in bytes will be copied and may end in a series of 0's if the configured size is greater than the size of the payload.

✎

Note   This command can result in large records which use a lot of router memory and export bandwidth.

Examples   The following example configures the first eight bytes from the IP header of the packets in the flows as a non-key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect ipv4 section header size 8
```

The following example configures the first 16 bytes from the payload of the packets in the flows as a non-key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect ipv4 section payload size 16
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the first 16 bytes from the payload of the packets in the flows as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect ipv4 section payload size 16
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect ipv4 source

To configure the IPv4 source address as a nonkey field for a flow record, use the **collectipv4source** command in flow record configuration mode. To disable the use of the IPv4 source address field as a nonkey field for a flow record, use the **no** form of this command.

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

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE
collect ipv4 source mask [{**minimum-mask** *mask*}]
no collect ipv4 source mask [{**minimum-mask** *mask*}]

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
collect ipv4 source {**mask** | **prefix**}
no collect ipv4 source {**mask** | **prefix**}

Syntax Description		
address	Configures the IPv4 source address as a nonkey field and enables collecting the value of the IPv4 source address from the flows.	
mask	Configures the IPv4 source address mask as a nonkey field and enables collecting the value of the IPv4 source address mask from the flows.	
prefix	Configures the prefix for the IPv4 source address as a nonkey field and enables collecting the value of the IPv4 source address 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 address is not configured as a nonkey field.

Command Modes

flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was integrated into Cisco IOS Release 12.2(33)SRC and implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.
15.1(3)T	This command was integrated into Cisco IOS Release 15.1(3)T for Cisco Performance Monitor with only the **mask**and**minimum-mask**keywords.

Release	Modification
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE for Cisco Performance Monitor with only the **mask**and**minimum-mask**keywords.
12.2(50)SY	This command was modified. The **address**and **minimum-mask** keywords were not supported in Cisco IOS Release 12.2(50)SY.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode. For Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode. Here we refer to them both as flow record configuration mode.

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

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE

Only the **mask**and**minimum-mask**keywords are available. You must first enter the**flowrecordtypeperformance-monitor** command**.**

collect ipv4 source prefix minimum-mask

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

collect ipv4 source mask minimum-mask

The source address mask is the number of bits that make up the network part of the source address. 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 configures the IPv4 source address prefix from the flows that have a prefix of 16 bits as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect ipv4 source prefix minimum-mask 16
```

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE

The following example configures the IPv4 source address prefix from the flows that have a prefix of 16 bits as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect ipv4 source prefix minimum-mask 16
```

Related Commands

Command	Description
flow record	Creates a flow record for Flexible NetFlow.
flow record type performance-monitor	Creates a flow record for Performance Monitor.

collect ipv4 total-length

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

collect ipv4 total-length [{**maximum** | **minimum**}]
no collect ipv4 total-length [{**maximum** | **minimum**}]

Syntax Description		
	maximum	(Optional) Configures the maximum value of the total length field as a nonkey field and enables collecting the maximum value of the total length field from the flows.
	minimum	(Optional) Configures the minimum value of the total length field as a nonkey field and enables collecting the minimum value of the total length field from the flows.

Command Default   The IPv4 total-length field is not configured as a nonkey field.

Command Modes

Flow record configuration (config-flow-record)

Command History	Release	Modification
	12.4(9)T	This command was introduced.
	12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
	12.0(33)S	This command was implemented on the Cisco 12000 series routers.
	12.2(33)SRC	Support for this command was added for Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.
	12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.

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

collect ipv4 total-length [minimum | maximum]

This command is used to collect the lowest and highest IPv4 total length values seen in the lifetime of the flow. Configuring this command results in more processing than is needed to simply collect the first total length value seen using the **collect ipv4 total-length** command.

Examples   The following example configures total-length value as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect ipv4 total-length
```

The following example configures minimum total-length value seen in the flows as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect ipv4 total-length minimum
```

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE

The following example configures the minimum total-length value seen in the flows as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect ipv4 total-length minimum
```

Related Commands	Command	Description
	flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
	flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect ipv4 ttl

To configure the IPv4 time-to-live (TTL) field as a nonkey field for a flow record, use the **collectipv4ttl** command in flow record configuration mode. To disable the use of the IPv4 TTL field as a nonkey field for a flow record, use the **no** form of this command.

collect ipv4 ttl [{**maximum** | **minimum**}]
no collect ipv4 ttl [{**maximum** | **minimum**}]

Syntax Description

maximum	(Optional) Configures the maximum value of the TTL field as a nonkey field and enables collecting the maximum value of the TTL field from the flows.
minimum	(Optional) Configures the minimum value of the TTL field as a nonkey field and enables collecting the minimum value of the TTL field from the flows.

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

Command Modes

flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was integrated into Cisco IOS Release 12.2(33)SRC and implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.
15.1(3)T	This command was integrated into Cisco IOS Release 15.1(3)T for Cisco Performance Monitor.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE for Cisco Performance Monitor.

Usage Guidelines   This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode. For Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode. Here we refer to them both as flow record configuration mode.

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

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE

You must first enter the **flowrecordtypeperformance-monitor** command.

collect ipv4 ttl [minimum | maximum]

This command is used to collect the lowest and highest IPv4 TTL values seen in the lifetime of the flow. Configuring this command results in more processing than is needed to simply collect the first TTL value seen using the **collectipv4ttl** command.

Examples

The following example configures the largest value for IPv4 TTL seen in the flows as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect ipv4 ttl maximum
```

The following example configures the smallest value for IPv4 TTL seen in the flows as a nonkey field

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect ipv4 ttl minimum
```

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE

The following example configures the smallest value for IPv4 TTL seen in the flows as a nonkey field

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect ipv4 ttl minimum
```

Related Commands

Command	Description
flow record	Creates a flow record for Flexible NetFlow.
flow record type performance-monitor	Creates a flow record for Performance Monitor.

collect ipv6

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

collect ipv6 {**dscp** | **flow-label** | **next-header** | **payload-length** | **precedence** | **protocol** | **traffic-class** | **version**}
no collect ipv6 {**dscp** | **flow-label** | **next-header** | **payload-length** | **precedence** | **protocol** | **traffic-class** | **version**}

Syntax Description

dscp	Configures the differentiated services code point (DCSP) field as a nonkey field and enables collecting the value in the IPv6 DSCP type of service (ToS) fields from the flows.
flow-label	Configures the IPv6 flow label as a nonkey field and enables collecting the value in the IPv6 flow label from the flows.
next-header	Configures the next-header field as a nonkey field and enables collecting the value of the next-header field in the IPv6 header from the flows.
payload-length	Configures the length of the IPv6 payload as a nonkey field and enables collecting the number of bytes used for the payload in the flows.
precedence	Configures the IPv6 precedence flag as a nonkey field and enables collecting the value in the IPv6 precedence (part of ToS) field from the flows.
protocol	Configures the IPv6 payload protocol field as a nonkey field and enables collecting the IPv6 value of the payload protocol field for the payload in the flows.
traffic-class	Configures the IPv6 traffic-class field as a nonkey field and enables collecting the value in the IPv6 protocol field from the flows.
version	Configures the IPv6 version field as a nonkey field and enables collecting the value in the IPv6 version field from the flows.

Command Default   The IPv6 fields are not configured as a nonkey field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(20)T	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.

Release	Modification
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Note   Some of the keywords for the **collect ipv6** command are documented as separate commands. All of the keywords for the **collect ipv6** command that are documented separately start with **collect ipv6**. For example, for information about configuring the IPv6 hop limit field as a nonkey field and collecting its value for a flow record, refer to the **collect ipv6 hop-limit** command.

Examples

The following example configures the IPv6 DSCP field as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect ipv6 dscp
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the IPv6 DSCP field as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect ipv6 dscp
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect ipv6 destination

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

collect ipv6 destination {**address** | {**mask** | **prefix**} [**minimum-mask** *mask*]}
no collect ipv6 destination {**address** | {**mask** | **prefix**} [**minimum-mask** *mask*]}

Command Syntax on Cisco Catalyst 6500 Switches running Cisco IOS Release 12.2(50)SY
collect ipv6 destination {**mask** | **prefix**}
no collect ipv6 destination {**mask** | **prefix**}

Syntax Description		
	address	Configures the IPv6 destination address as a nonkey field and enables collecting the value of the IPv6 destination address from the flows.
	mask	Configures the IPv6 destination address mask as a nonkey field and enables collecting the value of the IPv6 destination address mask from the flows.
	prefix	Configures the prefix for the IPv6 destination address as a nonkey field and enables collecting the value of the IPv6 destination address prefix from the flows.
	minimum-mask *mask*	(Optional) Specifies the size, in bits, of the minimum mask. Range: 1 to 128.

Command Default

TheIPv6 destination address is not configured as a nonkey field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(20)T	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was modified. The **address**and **minimum-mask** keywords were not supported in Cisco IOS Release 12.2(50)SY.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples

The following example configures the IPv6 destination address prefix from the flows that have a prefix of 16 bits as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect ipv6 destination prefix minimum-mask 16
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the IPv6 destination address prefix from the flows that have a prefix of 16 bits as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect ipv6 destination prefix minimum-mask 16
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect ipv6 extension map

To configure the bitmap of the IPv6 extension header map as a nonkey field for a flow record, use the **collect ipv6 extension map** command in flow record configuration mode. To disable the use of the IPv6 bitmap of IPv6 extension header map as a nonkey field for a flow record, use the **no** form of this command.

collect ipv6 extension map
no collect ipv6 extension map

Syntax Description

This command has no arguments or keywords.

Command Default

The use of the bitmap of the IPv6 extension header map is not configured as a nonkey field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(20)T	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Bitmap of the IPv6 Extension Header Map

The bitmap of IPv6 extension header map is made up of 32 bits.

```
    0     1     2     3     4     5     6     7
+-----+-----+-----+-----+-----+-----+-----+-----+
| Res | FRA1| RH  | FRA0| UNK | Res | HOP | DST |
```

```
+-----+-----+-----+-----+-----+-----+-----+-----+
   8     9    10    11    12    13    14    15
+-----+-----+-----+-----+-----+-----+-----+-----+
| PAY | AH  | ESP |           Reserved          |
+-----+-----+-----+-----+-----+-----+-----+-----+
  16    17    18    19    20    21    22    23
+-----+-----+-----+-----+-----+-----+-----+-----+
|                  Reserved                     |
+-----+-----+-----+-----+-----+-----+-----+-----+
  24    25    26    27    28    29    30    31
+-----+-----+-----+-----+-----+-----+-----+-----+
|                  Reserved                     |
+-----+-----+-----+-----+-----+-----+-----+-----+
0  Res  Reserved
1  FRA1 Fragmentation header - not first fragment
2  RH   Routing header
3  FRA0 Fragment header - first fragment
4  UNK  Unknown Layer 4 header
        (compressed, encrypted, not supported)
5  Res  Reserved
6  HOP  Hop-by-hop option header
7  DST  Destination option header
8  PAY Payload compression header
9  AH  Authentication Header
10 ESP Encrypted security payload
11 to 31 Reserved
```

For more information on IPv6 headers, refer to RFC 2460 *Internet Protocol, Version 6 (IPv6)* at the following URL: http://www.ietf.org/rfc/rfc2460.txt .

Examples

The following example configures the bitmap of IPv6 extension header map as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect ipv6 extension map
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the bitmap of IPv6 extension header map as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect ipv6 extension map
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect ipv6 fragmentation

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

collect ipv6 fragmentation {**flags** | **id** | **offset**}
no collect ipv6 fragmentation {**flags** | **id** | **offset**}

Syntax Description

flags	Configures the IPv6 fragmentation flags as a non-key field and enables collecting the value in the IPv6 fragmentation flag fields from the flows.
id	Configures the IPv6 fragmentation ID as a non-key field and enables collecting the value in the IPv6 fragmentation id fields from the flows
offset	Configures the IPv6 fragmentation offset as a non-key field and enables collecting the value in the IPv6 fragmentation offset field from the flows.

Command Default

The use of one or more of the IPv6 fragmentation fields is not configured as a nonkey field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(20)T	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

The Flexible NetFlow collect commands are used to configure nonkey fields for the flow monitor record and to enable capturing the values in the fields for the flow created with the record. The values in nonkey fields are added to flows to provide additional information about the traffic in the flows. A change in the value of

a nonkey field does not create a new flow. In most cases the values for nonkey fields are taken from only the first packet in the flow.

Examples

The following example configures the IPv6 fragmentation flags field as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect ipv6 fragmentation flags
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the IPv6 fragmentation flags field as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect ipv6 fragmentation flags
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect ipv6 hop-limit

To configure the IPv6 hop limit as a nonkey field for a flow record, use the **collect ipv6 hop-limit** command in flow record configuration mode. To disable the use of the IPv6 hop limit field as a nonkey field for a flow record, use the **no** form of this command.

collect ipv6 hop-limit [**maximum**] [**minimum**]
no collect ipv6 hop-limit [**maximum**] [**minimum**]

Syntax Description		
maximum	(Optional) Configures the IPv6 maximum hop limit as a nonkey field and enables collecting the value of the IPv6 maximum hop limit from the flows.	
minimum	(Optional) Configures the IPv6 minimum hop limit as a nonkey field and enables collecting the value of the IPv6 minimum hop limit from the flows.	

Command Default The IPv6 hop limit is not configured as a nonkey field.

Command Modes

Flow record configuration (config-flow-record)

Command History	Release	Modification
	12.4(20)T	This command was introduced.
	12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
	15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
	Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines **collect ipv6 hop-limit [minimum | maximum]**

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

This command is used to collect the lowest and highest IPv6 hop limit values seen in the lifetime of the flow. Configuring this command results in more processing than is needed to simply collect the first hop limit value seen using the **collect ipv6 hop-limit** command.

Examples The following example configures the IPv6 maximum hop limit from the flows as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect ipv6 hop-limit maximum
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the IPv6 maximum hop limit from the flows as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect ipv6 hop-limit maximum
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect ipv6 length

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

collect ipv6 length {**header** | **payload** | **total** [**maximum**] [**minimum**]}
no collect ipv6 length {**header** | **payload** | **total** [**maximum**] [**minimum**]}

Syntax Description		
header	Configures the length in bytes of the IPv6 header, not including any extension headers, as a nonkey field and collects the value of it for a flow record.
payload	Configures the length in bytes of the IPv6 payload, including any extension headers, as a nonkey field and collects the value of it for a flow record.
total	Configures the total length in bytes of the IPv6 header and payload as a nonkey field and collects the value of it for a flow record.
maximum	(Optional) Configures the maximum total length in bytes of the IPv6 header and payload as a nonkey field and collects the value of it for a flow record.
minimum	(Optional) Configures the minimum total length in bytes of the IPv6 header and payload as a nonkey field and collects the value of it for a flow record.

Command Default The IPv6 length fields are not configured as a nonkey field.

Command Modes

Flow record configuration (config-flow-record)

Command History	Release	Modification
	12.4(20)T	This command was introduced.
	12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
	15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
	Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines **collect ipv6 length [minimum | maximum]**

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible

NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

This command is used to collect the lowest and highest IPv6 length values seen in the lifetime of the flow. Configuring this command results in more processing than is needed to simply collect the length value seen using the **collect ipv6 length** command.

Examples

The following example configures the length of the IPv6 header, not including any extension headers, in bytes as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect ipv6 length header
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the length of the IPv6 header, not including any extension headers, in bytes as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect ipv6 length header
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect ipv6 section

To configure a section of an IPv6 packet as a nonkey field for a flow record, use the **collect ipv6 section** command in flow record configuration mode. To disable the use of a section of an IPv6 packet as a nonkey field for a flow record, use the **no** form of this command.

collect ipv6 section {**header size** *header-size* | **payload size** *payload-size*}
no collect ipv6 section {**header size** *header-size* | **payload size** *payload-size*}

Syntax Description		
header size *header-size*	Configures the number of bytes of raw data, starting at the IPv6 header, to use as a nonkey field, and enables collecting the value in the raw data from the flows. Range: 1 to 1200.
payload size *payload-size*	Configures the number of bytes of raw data, starting at the IPv6 payload, to use as a nonkey field, and enables collecting the value in the raw data from the flows. Range: 1 to 1200.

Command Default   A section of an IPv6 packet is not configured as a non-key field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(20)T	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines   This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

It is recommended that you configure both **header size** and **payload size** so that you know how much data is going to be captured.

Note   The IPv6 payload data is captured only if the first packet in the flow is an IPv6 packet. If the first packet in the flow is not an IPv6 packet, information from other packets in the flow such as packet and byte counters, is still captured.

---

collect ipv6 section header

This command causes a copy of the first IPv6 header to be put into the flow record for this flow. Only the configured size in bytes will be copied, and part of the payload will also be captured if the configured size is larger than the size of the header.

Note   Configuring this command can result in large records that use a lot of router memory and export bandwidth.

---

collect ipv6 section payload

This command causes a copy of the first IPv6 payload to be put into the flow record for this flow. Only the configured size in bytes will be copied, and it may end in a series of zeros if the configured size is smaller than the size of the payload.

Note   Configuring this command can result in large records that use a lot of router memory and export bandwidth.

Examples

The following example configures the first eight bytes from the IPv6 header of the packets in the flows as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect ipv6 section header size 8
```

The following example configures the first 16 bytes from the payload of the IPv6 packets in the flows as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect ipv6 section payload size 16
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the first 16 bytes from the payload of the IPv6 packets in the flows as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect ipv6 section payload size 16
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect ipv6 source

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

collect ipv6 source {**address** | {**mask** | **prefix**} [**minimum-mask** *mask*]}
no collect ipv6 source {**address** | {**mask** | **prefix**} [**minimum-mask** *mask*]}

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
collect ipv6 source {**mask** | **prefix**}
no collect ipv6 source {**mask** | **prefix**}

Syntax Description

address	Configures the IPv6 source address as a nonkey field and enables collecting the value of the IPv6 source address from the flows.
mask	Configures the IPv6 source address mask as a nonkey field and enables collecting the value of the IPv6 source address mask from the flows.
prefix	Configures the prefix for the IPv6 source address as a nonkey field and enables collecting the value of the IPv6 source address prefix from the flows.
minimum-mask *mask*	(Optional) Specifies the size, in bits, of the minimum mask. Range: 1 to 128.

Command Default

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

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(20)T	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was modified. The **address** and **minimum-mask** keywords were not supported in Cisco IOS Release 12.2(50)SY.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

collect IPv6 source prefix minimum mask

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

collect IPv6 source mask minimum mask

The source address mask is the number of bits that make up the network part of the source address. 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 configures the IPv6 source address prefix from the flows that have a prefix of 16 bits as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect ipv6 source prefix minimum-mask 16
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the IPv6 source address prefix from the flows that have a prefix of 16 bits as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect ipv6 source prefix minimum-mask 16
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect mpls label

To configure MPLS label fields as a nonkey field for a flow record, use the **collect mpls label** command in flow record configuration mode. To disable the use of the MPLS label fields as a nonkey field for a flow record, use the **no** form of this command.

collect mpls {**label 1** | {**details** | **exp** | **ttl**} | **label 2** | {**details**} | **label 3** | {**details**} | **label 4** | {**details**} | **label 5** | {**details**} | **label 6** | {**details**}}
no collect mpls {**label 1** | {**details** | **exp** | **ttl**} | **label 2** | {**details**} | **label 3** | {**details**} | **label 4** | {**details**} | **label 5** | {**details**} | **label 6** | {**details**}}

Syntax Description

label 1	Configures the first MPLS label as a nonkey field.
details	Configures the details of the MPLS label as a nonkey field.
exp	Configures the MPLS experimental level field as a nonkey field.
ttl	Configures the time-to-life (TTL) for the MPLS label as a nonkey field.
label 2	Configures the second MPLS label as a nonkey field.
label 3	Configures the third MPLS label as a nonkey field.
label 4	Configures the fourth MPLS label as a nonkey field.
label 5	Configures the fifth MPLS label as a nonkey field.
label 6	Configures the sixth MPLS label as a nonkey field.

Command Default   MPLS label fields are not configured as a nonkey field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
Cisco IOS XE Release 3.9S	This command was introduced.

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

Examples   The following example configures the details of the first MPLS label as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect mpls label 1 details
```

Related Commands

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

collect policy qos classification hierarchy

To configure QoS policy classification hierarchy field as a nonkey field for a flow record, use the **collect policy qos classification hierarchy** command in flow record configuration mode. To disable the use of the MPLS label fields as a nonkey field for a flow record, use the **no** form of this command.

collect policy qos classification hierarchy
no collect policy qos classification hierarchy

Syntax Description

This command has no arguments or keywords.

Command Default

QoS policy classification hierarchy field is not configured as a nonkey field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
Cisco IOS XE Release 3.9S	This command was introduced.

Usage Guidelines

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

Examples

The following example configures the details of the QoS policy classification hierarchy field as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect policy qos classification hierarchy
```

Related Commands

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

collect policy qos queue index

To configure the QoS policy queue index as a nonkey field for a flow record, use the **collect policy qos queue index**command in flow record configuration mode. To disable the use of one or more of the routing attributes as a nonkey field for a flow record, use the **no** form of this command.

collect policy qos queue index
no collect policy qos queue index

Syntax Description   This command has no arguments or keywords.

Command Default   QoS policy queue index is not configured as a nonkey field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
Cisco IOS XE Release 3.9S	This command was introduced.

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

Examples   The following example configures the QoS policy queue index as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect policy qos queue index
```

Related Commands

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

collect routing

To configure one or more of the routing attributes as a nonkey field for a flow record, use the **collect routing**command in flow record configuration mode. To disable the use of one or more of the routing attributes as a nonkey field for a flow record, use the **no** form of this command.

collect routing {**destination**|**source**} [{**as** [{**4-octet**|**peer** [**4-octet**]}]|**traffic-index**|**forwarding-status**| **next-hop address** {**ipv4**|**ipv6**} [**bgp**]|**vrf input**|**vrf output**}]
no collect routing {**destination**|**source**} [{**as** [{**4-octet**|**peer** [**4-octet**]}]|**traffic-index**| **forwarding-status**|**next-hop address** {**ipv4**|**ipv6**} [**bgp**]|**vrf input**|**vrf output**}]

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE
collect routing forwarding-status [**reason**]
no collect routing forwarding-status [**reason**]

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
collect routing {**destination**|**source**} [{**as** [{**peer** }]|**forwarding-status**|**next-hop address** {**ipv4** | **ipv6**} [**bgp**]}]
no collect routing {**destination**|**source**} [{**as** [{**peer** }]|**forwarding-status**|**next-hop address** {**ipv4** | **ipv6**} [**bgp**]}]

Syntax Description

destination	Configures one or more of the destination routing attributes fields as a nonkey field and enables collecting the values from the flows.
source	Configures one or more of the source routing attributes fields as a nonkey field and enables collecting the values from the flows.
as	Configures the autonomous system field as a nonkey field and enables collecting the value in the autonomous system field from the flows.
4-octet	(Optional) Configures the 32-bit autonomous system number as a nonkey field.
peer	(Optional) Configures the autonomous system number of the peer network as a nonkey field and enables collecting the value of the autonomous system number of the peer network from the flows.
traffic-index	Configures the Border Gateway Protocol (BGP) source or destination traffic index as a nonkey field and enables collecting the value of the BGP destination traffic index from the flows.
forwarding-status	Configures the forwarding status as a nonkey field and enables collecting the value of the forwarding status of the packet from the flows.
next-hop address	Configures the next-hop address value as a nonkey field and enables collecting information regarding the next hop from the flows. The type of address (IPv4 or IPv6) is determined by the next keyword entered.
ipv4	Specifies that the next-hop address value is an IPv4 address.
ipv6	Specifies that the next-hop address value is an IPv6 address.

bgp	(Optional) Configures the IP address of the next hop BGP network as a nonkey field and enables collecting the value of the IP address of the BGP next-hop network from the flows.
vrf input	Configures the Virtual Routing and Forwarding (VRF) ID for incoming packets as a nonkey field.
vrf output	Configures the Virtual Routing and Forwarding (VRF) ID for outgoing packets as a nonkey field.
reason	Configures the reason for the forwarding status as a nonkey field.

Command Default   The routing attributes are not configured as a nonkey field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was integrated into Cisco IOS Release 12.2(33)SRC and implemented on the Cisco 7200 series routers.
12.4(20)T	This command was modified. The **ipv6** keyword was added.
15.0(1)M	This command was modified. The **vrf input** keywords were added.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.
Cisco IOS XE Release 3.2S	This command was modified. The **4-octet** keyword was added.
15.1(3)T	This command was integrated into Cisco IOS Release 15.1(3)T for Cisco Performance Monitor with only the **forwarding-status** keyword and the addition of the **reason** keyword.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE for Cisco Performance Monitor with only the **forwarding-status** keyword and the addition of the **reason** keyword.
12.2(50)SY	This command was modified. The **traffic-index** and **vrf input** keywords were not supported in Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.8S	This command was modified. The **vrf output** keyword was added.

Usage Guidelines   This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command; however the mode prompt is the same for both products. For Flexible NetFlow, the mode is also known as Flexible NetFlow flow record

configuration mode. For Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode. Here we refer to them both as flow record configuration mode.

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

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE

The **reason** keyword was added and only the **forwarding-status** keyword is available. You must first enter the**flow record type performance-monitor** command**.**

collect routing source as [**peer**]

This command collects the 16-bit autonomous system number based on a lookup of the router's routing table using the source IP address. The optional **peer** keyword provides the expected next network, as opposed to the originating network.

collect routing source as 4-octet [**peer 4-octet**]

This command collects the 32-bit autonomous system number based on a lookup of the router's routing table using the source IP address. The optional **peer** keyword provides the expected next network, as opposed to the originating network.

collect routing destination as [**peer**]

This command collects the 16-bit autonomous system number based on a lookup of the router's routing table using the destination IP address. The optional **peer** keyword provides the expected next network, as opposed to the destination network.

collect routing destination as 4-octet [**peer 4-octet**]

This command collects the 32-bit autonomous system number based on a lookup of the router's routing table using the destination IP address. The **peer** keyword provides the expected next network, as opposed to the destination network.

collect routing source traffic-index

This command collects the traffic-index field based on the source autonomous system for this flow. The traffic-index field is a value propagated through BGP.

This command is not supported for IPv6.

collect routing destination traffic-index

This command collects the traffic-index field based on the destination autonomous system for this flow. The traffic-index field is a value propagated through BGP.

This command is not supported for IPv6.

collect routing forwarding-status

This command collects a field to indicate if the packets were successfully forwarded. The field is in two parts and may be up to 4 bytes in length. For the releases specified in the Command History table, only the status field is used:

```
+-+-+-+-+-+-+-+-+
| S | Reason    |
| t | codes     |
```

```
                | a | or        |
                | t | flags     |
                | u |           |
                | s |           |
                +-+-+-+-+-+-+-+-+
                 0 1 2 3 4 5 6 7
              Status:
              00b=Unknown, 01b = Forwarded, 10b = Dropped, 11b = Consumed
```

collect routing vrf input

This command collects the VRF ID from incoming packets on a router. In the case where VRFs are associated with an interface via methods such as VRF Selection Using Policy Based Routing/Source IP Address, a VRF ID of 0 will be recorded. If a packet arrives on an interface that does not belong to a VRF, a VRF ID of 0 is recorded.

collect routing vrf output

This command collects the outgoing VRF ID for outgoing packets on a router based on the VRF associated with the outgoing interface.

Examples

The following example configures the 16-bit autonomous system number based on a lookup of the router's routing table using the source IP address as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect routing source as
```

The following example configures the 16-bit autonomous system number based on a lookup of the router's routing table using the destination IP address as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect routing destination as
```

The following example configures the value in the traffic-index field based on the source autonomous system for a flow as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect routing source traffic-index
```

The following example configures the forwarding status as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect routing forwarding-status
```

The following example configures the VRF ID for incoming packets as a nonkey field for a Flexible NetFlow flow record:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect routing vrf input
```

The following example configures the VRF ID for outgoing packets as a nonkey field for a Flexible NetFlow flow record:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect routing vrf output
```

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE

The following example configures the forwarding status as a nonkey field for a Performance Monitor flow record:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect routing forwarding-status reason
```

Related Commands	Command	Description
	flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
	flow record type performance-monitor	Creates a flow record for Performance Monitor.

collect routing is-multicast

To configure the use of the is-multicast field (indicating that the IPv4 traffic is multicast traffic) as a nonkey field, use the **collect routing is-multicast**command in flow record configuration mode. To disable the use of the is-multicast field as a nonkey field for a flow record, use the **no** form of this command.

collect routing is-multicast
no collect routing is-multicast

Syntax Description   This command has no arguments or keywords

Command Default   The is-multicast field is not configured as a nonkey field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(22)T	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines   This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples   The following example configures the is-multicast field as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect routing is-multicast
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the is-multicast field as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect routing is-multicast
```

Related Commands	Command	Description
	flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
	flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect services pfr

To configure the Performance Routing (PfR) traffic class ID and the primary controller ID per packet as a nonkey field for a flow record, use the **collect services pfr** command in Flexible NetFLow flow record configuration mode. To disable the use of the PfR IDs as a nonkey field for a flow record, use the **no** form of this command.

collect services pfr {**traffic-class-id** | **mc-id**}
no collect services pfr {**traffic-class-id** | **mc-id**}

Syntax Description		
	traffic-class-id	Configures the Performance Routing (PfR) traffic class ID per packet as a nonkey field.
	mc-id	Configures the Performance Routing (PfR) primary controller ID per packet as a nonkey field.

Command Default

The PfR IDs per packet are not configured as a nonkey field.

Command Modes

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

Command History

Release	Modification
Cisco IOS XE Release 3.9S	This command was introduced.

Usage Guidelines

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

Examples

The following example configures the PfR traffic class ID per packet as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect services pfr traffic-class-id
```

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 nonkey field for a flow record, use the **collect timestamp absolute** command in Flexible NetFlow flow record configuration mode. To disable the use of the first seen or last seen packet in a flow as a nonkey 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 that the first packet was seen from the flows as a nonkey field and enables collecting time stamps based on the system uptime for the time the first packet was seen from the flows.
last	Configures the absolute time that the last packet was seen from the flows as a nonkey field and enables collecting time stamps based on the system uptime for the time the most recent packet was seen from the flows.

Command Default
The absolute time field is not configured as a nonkey field.

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

Command History

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

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

Example

The following example configures time stamps for the absolute time that the first packet was seen from the flows as a nonkey field:

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

The following example configures the time stamps for the absolute time that the most recent packet was seen from the flows as a nonkey field:

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

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

collect timestamp sys-uptime

To configure the system uptime of the first seen or last seen packet in a flow as a nonkey field for a flow record, use the **collect timestamp sys-uptime** command in flow record configuration mode. To disable the use of the first seen or last seen packet in a flow as a nonkey field for a flow record, use the **no** form of this command.

collect timestamp sys-uptime {**first** | **last**}
no collect timestamp sys-uptime {**first** | **last**}

Syntax Description

first	Configures the system uptime for the time the first packet was seen from the flows as a nonkey field and enables collecting time stamps based on the system uptime for the time the first packet was seen from the flows.
last	Configures the system uptime for the time the last packet was seen from the flows as a nonkey field and enables collecting time stamps based on the system uptime for the time the most recent packet was seen from the flows.

Command Default

The system uptime field is not configured as a nonkey field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	Support for this command was added for Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples

The following example configures time stamps based on the system uptime for the time the first packet was seen from the flows as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect timestamp sys-uptime first
```

The following example configures the time stamps based on the system uptime for the time the most recent packet was seen from the flows as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect timestamp sys-uptime last
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the time stamps based on the system uptime for the time the most recent packet was seen from the flows as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect timestamp sys-uptime last
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect transport

To configure one or more of the transport layer fields as a nonkey field for a flow record, use the **collect transport** command in flow record configuration mode. To disable the use of one or more of the transport layer fields as a nonkey field for a flow record, use the **no** form of this command.

collect transport {**destination-port** | **igmp type** | **source-port**}
no collect transport {**destination-port** | **igmp type** | **source-port**}

Syntax Description

destination-port	Configures the destination port as a nonkey field and enables collecting the value of the destination port from the flows.
igmp type	Configures the Internet Group Management Protocol (IGMP) type as a nonkey field and enables collecting the value of the IGMP type from the flows.
source-port	Configures the source port as a nonkey field and enables collecting the value of the source port from the flows.

Command Default

The transport layer fields are not configured as a nonkey field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	Support for this command was added for Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible

NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples

The following example configures the transport destination port as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect transport destination-port
```

The following example configures the transport source port as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect transport source-port
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the transport source port as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect transport source-port
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect transport icmp ipv4

To configure the internet control message protocol (ICMP) IPv4 type field and the code field as nonkey fields for a flow record, use the **collect transport icmp ipv4** command in flow record configuration mode. To disable the use of the ICMP IPv4 type field and code field as nonkey fields for a flow record, use the **no** form of this command.

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

Syntax Description

code	Configures the ICMP code as a nonkey field and enables collecting the value of the ICMP code from the flow.
type	Configures the ICMP type as a nonkey field and enables collecting the value of the ICMP type from the flow.

Command Default The ICMP IPv4 type field and the code field are not configured as nonkey fields.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	Support for this command was added for Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples

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

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect transport icmp ipv4 code
```

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

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect transport icmp ipv4 type
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

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

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect transport icmp ipv4 type
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect transport icmp ipv6

To configure the Internet Control Message Protocol (ICMP) IPv6 type field and code field as nonkey fields for a flow record, use the **collect transport icmp ipv6** command in flow record configuration mode. To disable the use of the ICMP IPv6 type field and code field as nonkey fields for a flow record, use the **no** form of this command.

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

Syntax Description	code	Configures the ICMP code as a nonkey field and enables collecting the value of the ICMP code from the flow.
	type	Configures the ICMP type as a nonkey field and enables collecting the value of the ICMP type from the flow.

Command Default The ICMP IPv6 type field and code field are not configured as nonkey fields.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(20)T	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples

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

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect transport icmp ipv6 code
```

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

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect transport icmp ipv6 type
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

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

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect transport icmp ipv6 type
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect transport tcp

To configure one or more of the TCP fields as a nonkey field for a flow record, use the **collect transport tcp** command in flow record configuration mode. To disable the use of one or more of the TCP fields as a nonkey field for a flow record, use the **no** form of this command.

collect transport tcp {**acknowledgement-number** | **destination-port** | **flags** [{**ack** | **cwr** | **ece** | **fin** | **psh** | **rst** | **syn** | **urg**}] | **header-length** | **maximum-segment-size** | **sequence-number** | **source-port** | **urgent-pointer** | **window-size** | **window-size-average** | **window-size-maximum** | **window-size-minimum**}
no collect transport tcp {**acknowledgement-number** | **destination-port** | **flags** [{**ack** | **cwr** | **ece** | **fin** | **psh** | **rst** | **syn** | **urg**}] | **header-length** | **maximum-segment-size** | **sequence-number** | **source-port** | **urgent-pointer** | **window-size** | **window-size-average** | **window-size-maximum** | **window-size-minimum**}

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
collect transport tcp flags [{**ack** | **cwr** | **ece** | **fin** | **psh** | **rst** | **syn** | **urg**}]
no collect transport tcp flags [{**ack** | **cwr** | **ece** | **fin** | **psh** | **rst** | **syn** | **urg**}]

Cisco IOS XE Release 3.2SE
collect transport tcp flags [{**ack** | **cwr** | **ece** | **fin** | **psh** | **rst** | **syn** | **urg**}]
no collect transport tcp flags [{**ack** | **cwr** | **ece** | **fin** | **psh** | **rst** | **syn** | **urg**}]

Syntax Description

acknowledgement- number	Configures the TCP acknowledgement number as a nonkey field and enables collecting the value of the TCP acknowledgment number from the flow.
destination-port	Configures the TCP destination port as a nonkey field and enables collecting the value of the TCP destination port from the flow.
flags	Configures one or more of the TCP flags as a nonkey field and enables collecting the values from the flow.
ack	(Optional) Configures the TCP acknowledgment flag as a nonkey field.
cwr	(Optional) Configures the TCP congestion window reduced flag as a nonkey field.
ece	(Optional) Configures the TCP Explicit Congestion Notification echo (ECE) flag as a nonkey field.
fin	(Optional) Configures the TCP finish flag as a nonkey field.
psh	(Optional) Configures the TCP push flag as a nonkey field.
rst	(Optional) Configures the TCP reset flag as a nonkey field.
syn	(Optional) Configures the TCP synchronize flag as a nonkey field.
urg	(Optional) Configures the TCP urgent flag as a nonkey field.
header-length	Configures the TCP header length (in 32-bit words) as a nonkey field and enables collecting the value of the TCP header length from the flow.

maximum-segment-size	Configures the maximum segment size as a nonkey field and enables collecting the values from the flow.
sequence-number	Configures the TCP sequence number as a nonkey field and enables collecting the value of the TCP sequence number from the flow.
source-port	Configures the TCP source port as a nonkey field and enables collecting the value of the TCP source port from the flow.
urgent-pointer	Configures the TCP urgent pointer as a nonkey field and enables collecting the value of the TCP urgent pointer from the flow.
window-size	Configures the TCP window size as a nonkey field and enables collecting the value of the TCP window size from the flow.
window-size-average	Configures the average window size as a nonkey field and enables collecting the values from the flow.
window-size-maximum	Configures the maximum window size as a nonkey field and enables collecting the values from the flow.
window-size-minimum	Configures the minimum window size as a nonkey field and enables collecting the values from the flow.

Command Default　　The TCP fields are not configured as a nonkey field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	Support for this command was added for Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY without the support of the **acknowledgement-number**, **destination-port**, **header-length**, **sequence-number,source-port**, **urgent-pointer**,and **window-size** keywords.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Release	Modification
Cisco IOS XE Release 3.6S	This command was modified. The **maximum-segment-size**, **window-size-average**, **window-size-maximum**, and **window-size-minimum** keywords were added into Cisco IOS XE Release 3.6S for Cisco Performance Monitor.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE without the support for the **acknowledgement-number**, **destination-port**, **header-length**, **sequence-number**,**source-port**, **urgent-pointer**,and **window-size** keywords.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

collect transport tcp flags ece

For more information about ECN echo, refer to RFC 3168 *The Addition of Explicit Congestion Notification (ECN) to IP* , at the following URL: http://www.ietf.org/rfc/rfc3168.txt .

Examples

The following example configures the TCP acknowledgment number as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect transport tcp acknowledgement-number
```

The following example configures the TCP source port as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect transport tcp source-port
```

The following example configures the TCP acknowledgment flag as a nonkey field:

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

The following example configures the TCP finish flag as a nonkey field:

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

The following example configures the TCP reset flag as a nonkey field:

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

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the TCP reset flag as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect transport tcp flags rst
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

collect transport udp

To configure one or more of the user datagram protocol UDP fields as a nonkey field for a flow record, use the **collect transport udp** command in flow record configuration mode. To disable the use of one or more of the UDP fields as a nonkey field for a flow record, use the **no** form of this command.

collect transport udp {**destination-port** | **message-length** | **source-port**}
no collect transport udp {**destination-port** | **message-length** | **source-port**}

Syntax Description

destination-port	Configures the UDP destination port as a nonkey field and enables collecting the value of the UDP destination port fields from the flow.
message-length	Configures the UDP message length as a nonkey field and enables collecting the value of the UDP message length fields from the flow.
source-port	Configures the UDP source port as a nonkey field and enables collecting the value of the UDP source port fields from the flow.

Command Default   The UDP fields are not configured as nonkey fields.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	Support for this command was added for Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines   This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible

NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples

The following example configures the UDP destination port as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect transport udp destination-port
```

The following example configures the UDP message length as a nonkey field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect transport udp message-length
```

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

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# collect transport udp source-port
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the UDP source port as a nonkey field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# collect transport udp source-port
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

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. Range: 1 to 65535.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Examples

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

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

	Command	Description
Related Commands	**clear flow exporter**	Clears the Flexible NetFlow statistics for exporters.

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

Syntax Description

error	(Optional) Enables debugging for flow monitor errors.
name	(Optional) Specifies the name of a flow monitor.
monitor-name	(Optional) The name of a flow monitor that was previously configured.
cache	(Optional) Enables debugging for the flow monitor cache.
packets	(Optional) Enables packet-level debugging for flow monitors.
packets	(Optional) The number of packets to debug for packet-level debugging of flow monitors. Range: 1 to 65535.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Examples

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

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

Related Commands	Command	Description
	clear flow monitor	Clears the Flexible NetFlow flow monitor.

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* | **netflow-original** | **netflow** {**ipv4** | **ipv6**} *record* [**peer**] | **netflow-v5** | **options** {**exporter-statistics** | **interface-table** | **sampler-table** | **vrf-id-name-table**}}]
no debug flow record [{[**name**] *record-name* | **netflow-original** | **netflow** {**ipv4** | **ipv6**} *record* [**peer**] | **netflow-v5** | **options** {**exporter-statistics** | **interface-table** | **sampler-table** | **vrf-id-name-table**}}]

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
debug flow record [{[**name**] *record-name* | **netflow-v5** | **options** {**exporter-statistics** | **interface-table** | **sampler-table** | **vrf-id-name-table**} | **platform-original** {**ipv4** | **ipv6**} *record* [{**detailed** | **error**}]}]
no debug flow record [{[**name**] *record-name* | **netflow-v5** | **options** {**exporter-statistics** | **interface-table** | **sampler-table** | **vrf-id-name-table**} | **platform-original** {**ipv4** | **ipv6**} *record* [{**detailed** | **error**}]}]

Cisco IOS XE Release 3.2SE
debug flow record [{[**name**] *record-name* | **netflow** {**ipv4** | **ipv6**} *record* [**peer**] | **netflow-v5** | **options** **sampler-table** }]
no debug flow record [{[**name**] *record-name* | **netflow** {**ipv4** | **ipv6**} *record* [**peer**] | **netflow-v5** | **options** **sampler-table** }]

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.
netflow-original	(Optional) Specifies the traditional IPv4 input NetFlow with origin autonomous systems.
netflow {**ipv4**	**ipv6**} *record*	(Optional) Specifies the name of the NetFlow predefined record. See the table below.
peer	(Optional) Includes peer information for the NetFlow predefined records that support the peer keyword. **Note** The **peer** keyword is not supported for every type of NetFlow predefined record. See the table below.
options	(Optional) Includes information on other flow record options.
exporter-statistics	(Optional) Includes information on the flow exporter statistics.
interface-table	(Optional) Includes information on the interface tables.
sampler-table	(Optional) Includes information on the sampler tables.
vrf-id-name-table	(Optional) Includes information on the virtual routing and forwarding (VRF) ID-to-name tables.
platform-original ipv4 *record*	Configures the flow monitor to use one of the predefined IPv4 records.

platform-original ipv6 *record*	Configures the flow monitor to use one of the predefined IPv6 records.
detailed	(Optional) Displays detailed information.
error	(Optional) Displays errors only.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.4(20)T	This command was modified. The **ipv6** keyword was added in Cisco IOS Release 12.4(20)T.
15.0(1)M	This command was modified. The **vrf-id-name-table** keyword was added.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY without support for the **netflow-original**, **netflow**, **ipv4**, **netflow**, **ipv6** and **peer** keywords. The **platform-original ipv4** and **platform-originalipv6** keywords were added.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE without the support for the **netflow-original**, **options exporter-statistics**, **options interface-table** and **option vrf-id-name-table** keywords.

Usage Guidelines

The table below describes the keywords and descriptions for the *record* argument.

Table 1: Keywords and Descriptions for the record Argument

Keyword	Description	IPv4 Support	IPv6 Support
as	Autonomous system record.	Yes	Yes
as-tos	Autonomous system and type of service (ToS) record.	Yes	—
bgp-nexthop-tos	BGP next-hop and ToS record.	Yes	—
bgp-nexthop	BGP next-hop record.	—	Yes

Keyword	Description	IPv4 Support	IPv6 Support
destination	Original 12.2(50)SY platform IPv4/IPv6 destination record.	Yes	Yes
destination-prefix	Destination prefix record. **Note** For IPv6, a minimum prefix mask length of 0 bits is assumed.	Yes	Yes
destination-prefix-tos	Destination prefix and ToS record.	Yes	—
destination-source	Original 12.2(50)SY platform IPv4/IPv6 destination-source record.	Yes	Yes
full	Original 12.2(50)SY platform IPv4/IPv6 full record.	Yes	Yes
interface-destination	Original 12.2(50)SY platform IPv4/IPv6 interface-destination record.	Yes	Yes
interface-destination-source	Original 12.2(50)SY platform IPv4/IPv6 interface-destination-source record.	Yes	Yes
interface-full	Original 12.2(50)SY platform IPv4/IPv6 interface-full record.	Yes	Yes
interface-source	Original 12.2(50)SY platform IPv4/IPv6 interface-source only record.	Yes	Yes
original-input	Traditional IPv4 input NetFlow.	Yes	Yes
original-output	Traditional IPv4 output NetFlow.	Yes	Yes
prefix	Source and destination prefixes record. **Note** For IPv6, a minimum prefix mask length of 0 bits is assumed.	Yes	Yes
prefix-port	Prefix port record. **Note** The **peer** keyword is not available for this record.	Yes	—
prefix-tos	Prefix ToS record.	Yes	—
protocol-port	Protocol ports record. **Note** The **peer** keyword is not available for this record.	Yes	Yes
protocol-port-tos	Protocol port and ToS record. **Note** The **peer** keyword is not available for this record.	Yes	—

Keyword	Description	IPv4 Support	IPv6 Support
source	Original 12.2(50)SY platform IPv4/IPv6 source only record.	Yes	Yes
source-prefix	Source autonomous system and prefix record. **Note** For IPv6, a minimum prefix mask length of 0 bits is assumed.	Yes	Yes
source-prefix-tos	Source prefix and ToS record.	Yes	—

Examples

The following example enables debugging for the flow record:

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

Related Commands

Command	Description
flow record	Create a Flexible NetFlow flow record.

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
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Examples

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

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

Related Commands	Command	Description
	clear sampler	Clears the Flexible NetFlow sampler statistics.

default (Flexible NetFlow)

To configure the default values for a Flexible NetFlow (FNF) flow exporter, use the **default** command in Flexible NetFlow flow exporter configuration mode.

default {**description** | **destination** | **dscp** | **export-protocol** | **option** {**application-table** | **exporter-stats** | **interface-table** | **sampler-table** | **vrf-table**} | **output-features** | **source** | **template data timeout** | **transport** | **ttl**}

Cisco IOS XE Release 3.2SE
default {**description** | **destination** | **dscp** | **export-protocol** | **option** {**exporter-stats** | **interface-table** | **sampler-table**} | **source** | **template data timeout** | **transport** | **ttl**}

Syntax Description

description	Provides a description for the flow exporter.
destination	Configures the export destination.
dscp	Configures optional Differentiated Services Code Point (DSCP) values.
export-protocol	Configures the export protocol version.
option	Selects the option for exporting.
application-table	Selects the application table option.
exporter-stats	Selects the exporter statistics option.
interface-table	Selects the interface SNMP-index-to-name table option.
sampler-table	Selects the export sampler option.
vrf-table	Selects the VRF ID-to-name table option.
output-features	Sends export packets via the Cisco IOS output feature path.
source	Configures the originating interface.
template	Configures the flow exporter template.
data	Configure the flow exporter data.
timeout	Resends data based on a timeout.
transport	Configures the transport protocol.
ttl	Configures optional time-to-live (TTL) or hop limit.

Command Modes

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

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE without the support for the **option application-table** , **option vrf-table**, and **output-features** keywords.

Usage Guidelines

Use the **default** command to configure the default values for an FNF flow exporter. The flow exporter information is needed to export the data metrics to a specified destination, port number, and so on.

Examples

The following example shows how to set the default destination for an FNF flow exporter:

```
Router(config)# flow exporter e1
Router(config-flow-exporter)# default destination
```

Related Commands

Command	Description
flow exporter	Creates a flow exporter.

description (Flexible NetFlow)

To configure a description for a Flexible NetFlow flow sampler, 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**

Syntax Description

description	Text string that describes the flow sampler, flow monitor, flow exporter, or flow record.

Command Default

The default description for a Flexible NetFlow flow sampler, flow monitor, flow exporter, or flow record is "User defined".

Command Modes

Flexible NetFlow flow exporter configuration (config-flow-exporter)
Flexible NetFlow flow monitor configuration (config-flow-monitor)
Flexible NetFlow flow record configuration (config-flow-record)
Flexible NetFlow sampler configuration (config-sampler)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
Cisco IOS XE 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Examples

The following example configures a description for a flow monitor:

```
Router(config)# flow monitor FLOW-MONITOR-1
Router(config-flow-monitor)# description Monitors traffic to 172.16.100.0 255.255.255.0
```

Related Commands

Command	Description
flow exporter	Creates a flow exporter.

Command	Description
flow monitor	Creates a flow monitor.
flow record	Creates a flow record.
sampler	Creates a flow sampler.

destination

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

destination {{*ip-addresshostname*} | **vrf** *vrf-name*}
no destination

Syntax Description

ip-address	IP address of the workstation to which you want to send the NetFlow information.
hostname	Hostname of the device to which you want to send the NetFlow information.
vrf *vrf-name*	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.

Command Default An export destination is not configured.

Command Modes

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

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
Cisco IOS XE Release 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
15.1(3)T	This command was modified. Support for the Cisco Performance Monitor was added.
12.2(58)SE	This command was modified. Support for the Cisco Performance Monitor was added.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T and added support for exporting data to a destination using an IPv6 address.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

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

For some releases, you can export data to a destination using an IPv6 address.

When you configure a hostname instead of the IP address for the device, the hostname is resolved immediately and the IP 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 router does not detect this, and the exported data continues to be sent to the original IP address, resulting in a loss of data. Resolving the hostname immediately is a prerequisite of the export protocol, to ensure that the templates and options arrive before the data

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

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

```
Router(config)# flow exporter FLOW-EXPORTER-1
Router(config-flow-exporter)# destination 172.16.10.2 vrf VRF-1
```

Related Commands

Command	Description
flow exporter	Creates a flow exporter.

dscp (Flexible NetFlow)

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

dscp *dscp*
no dscp

Syntax Description

dscp	The DSCP to be used in the DSCP field in exported datagrams. Range: 0 to 63. Default: 0.

Command Default

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

Command Modes

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

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
15.1(3)T	This command was modified. Support for the Cisco Performance Monitor was added.
12.2(58)SE	This command was modified. Support for the Cisco Performance Monitor was added.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Examples

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

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

Related Commands

Command	Description
flow exporter	Creates a flow exporter.

execute (Flexible NetFlow)

To execute a shell function for a Flexible NetFlow (FNF) flow exporter, use the **execute** command in FNF flow exporter configuration mode.

execute *name* [{*description...*}]

Syntax Description

name	Name of the shell function to execute.
description	(Optional) Description of the shell function parameter values. You can enter multiple descriptions.

Command Default

No shell function is executed.

Command Modes

FNF flow exporter configuration (config-flow-exporter)

Command History

Release	Modification
15.4(M)	This command was introduced.

Examples

The following example shows how to execute a shell function, function1:

```
Router(config)# flow exporter e1
Router(config-flow-exporter)# execute function1
```

Related Commands

Command	Description
flow exporter	Creates a flow exporter.

exporter

To configure 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 (config-flow-monitor)
Policy configuration (config-pmap-c)
Policy monitor configuration (config-pmap-c-flowmon)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
Cisco IOS XE Release 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
15.1(3)T	This command was modified. Support for the Cisco Performance Monitor was added. Support was added for policy configuration mode and policy monitor configuration configuration mode.
12.2(58)SE	This command was modified. Support for the Cisco Performance Monitor was added.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

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.

For Performance Monitor, you can associate a flow exporter with a flow monitor while configuring either a flow monitor, policy map, or service policy.

Note   You can configure up to 5 flow exporters after using the **flow monitor type performance-monitor** 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
```

The following example shows one of the ways to configure a flow exporter for Performance Monitor:

```
Device(config)# policy-map type performance-monitor policy-4
Device(config-pmap)# class class-4
Device(config-pmap-c)# flow monitor monitor-4
Device(config-pmap-c-flowmon)# exporter exporter-4
```

Related Commands

Command	Description
flow exporter	Creates a flow exporter.
flow monitor	Creates a flow monitor.
flow monitor type performance-monitor	Creates a flow monitor for Performance Monitor.
policy-map type performance-monitor	Creates a policy map for Performance Monitor
service-policy type performance-monitor	Associates policy map with an interface for Performance Monitor.

export-protocol

To configure the export protocol for a Flexible NetFlow exporter, use the **export-protocol** command in Flexible NetFlow flow exporter configuration mode. To restore the use of the default export protocol for a Flexible NetFlow exporter, use the **no** form of this command.

export-protocol {**netflow-v5** | **netflow-v9** | **ipfix**}
no export-protocol

Cisco IOS XE Release 3.2SE
export-protocol netflow-v9
no export-protocol

Syntax Description		
netflow-v5	Configures Netflow Version 5 export as the export protocol.
netflow-v9	Configures Netflow Version 9 export as the export protocol.
ipfix	Configures IPFIX as the export protocol. The export of extracted fields from NBAR is supported only over IPFIX.

Command Default Netflow Version 9 export is used as the export protocol for a Flexible NetFlow exporter.

Command Modes

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

Command History	Release	Modification
	12.4(22)T	This command was introduced.
	12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
	Cisco IOS XE Release 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
	15.1(3)T	This command was modified. Support for the Cisco Performance Monitor was added.
	12.2(58)SE	This command was modified. Support for the Cisco Performance Monitor was added.
	15.2(4)M	This command was modified. The **ipfix** keyword was added in Cisco IOS Release 15.2(4)M.
	Cisco IOS XE Release 3.8S	This command was integrated into Cisco IOS XE Release 3.8S.
	Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE without the support for the **netflow-v5** and **ipfix** keywords.

Usage Guidelines

The NetFlow Version 5 export protocol is supported only for flow monitors that use the Flexible NetFlow predefined records.

The export of extracted fields from NBAR is supported only over IPFIX.

Examples

The following example configures Netflow Version 5 export as the export protocol for a Flexible NetFlow exporter:

```
Router(config)# flow exporter FLOW-EXPORTER-1
Router(config-flow-exporter)# export-protocol netflow-v5
```

Related Commands

Command	Description
flow exporter	Creates a flow exporter

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 (config)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
Cisco IOS XE 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
15.1(2)S	This command was modified. A hash collision between the name supplied and any existing name is now possible. If this happens, you can retry, supplying another name
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines Flow exporters export the data in the flow monitor cache to a remote system, such as a server running Flexible 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.

In Cisco IOS Release 15.1(2)S and later releases, a hash collision between the name supplied and any existing name is possible. If this happens, you can retry, supplying another name.

Examples

The following example creates a flow exporter named FLOW-EXPORTER-1 and enters Flexible NetFlow flow exporter configuration mode:

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

The following example shows the output when there is a hash collision between the name supplied and any existing name:

```
Router(config-flow-exporter)# flow exporter FLOW-EXPORTER-1
% Flow Exporter: Failure creating Flow Exporter 'FLOW-EXPORTER-1' (Hash value in use).
```

Related Commands

Command	Description
clear flow exporter	Clears the statistics for flow exporters.
debug flow exporter	Enables debugging output for flow exporters.

flow hardware

To configure Flexible NetFlow hardware parameters, use the **flowhardware** command in global configuration mode. To unconfigure Flexible NetFlow hardware parameters, use the **no** form of this command.

flow hardware [{**egress** | **export threshold** *total-cpu-threshold-percentage* [**linecard** *linecard-threshold-percentage*] | **usage notify** {**input** | **output**} [*table-threshold-percentage seconds*]}]
no flow hardware [{**egress** | **export threshold** | **usage notify** {**input** | **output**}}]

Syntax Description

egress	(Optional) Configures hardware egress NetFlow parameters.
export threshold	(Optional) Configures export threshold parameters.
total-cpu-threshold-percentage	(Optional) The total CPU utilization threshold percentage.
linecard-threshold-percentage	(Optional) The line-card CPU utilization threshold percentage.
usage notify input	(Optional) Configures NetFlow table utilization parameters for traffic that the router is receiving.
usage notify output	(Optional) Configures NetFlow table utilization parameters for traffic that the router is transmitting.
table-threshold-percentage	(Optional) The NetFlow table utilization threshold percentage.
seconds	(Optional) The NetFlow table utilization time interval, in seconds.

Command Default
Flexible NetFlow hardware parameters are not configured.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(50)SY	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 Flexible NetFlow collector, for analysis and storage. The number and complexity of flow records to be exported is the prime cause of CPU use in NetFlow. The CPU Friendly NetFlow Export feature (also known as Yielding NetFlow Data Export, or Yielding NDE) monitors CPU use for both the supervisor and line cards according to user-configured thresholds and dynamically adjusts the rate of export as needed.

A system reload is needed for egress NetFlow mode change. If egress NetFlow is disabled and you attempt to configure any feature that requires an egress NetFlow, an error message will be displayed indicating that egress NetFlow must be enabled for this feature to function. You should enable egress NetFlow, reload the system, and reconfigure the feature.

Examples
The following example configures CPU utilization thresholds for Flexible NetFlow flow export:

```
Router(config)# flow hardware export threshold 25 linecard 25
```

Related Commands

Command	Description
show platform flow	Displays Flexible NetFlow platform parameter information.

flow monitor

To create a Flexible NetFlow flow monitor, or to modify an existing Flexible NetFlow flow monitor, and enter Flexible NetFlow flow monitor configuration mode, use the **flow monitor** command in global configuration mode or in QoS policy-map-class configuration mode. To remove a Flexible NetFlow 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 (config)

QoS policy-map-class configuration (config-pmap-c)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
Cisco IOS XE Release 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
15.1(2)S	This command was modified. A hash collision between the name supplied and any existing name is now possible. If this happens, you can retry, supplying another name
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
15.2(4)M	This command was made available in QoS policy-map-class configuration mode.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines   Flow monitors are the Flexible NetFlow component that is applied to interfaces to perform network traffic monitoring. Flow monitors consist of a 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.

In Cisco IOS Release 15.1(2)S and later releases, a hash collision between the name supplied and any existing name is possible. If this happens, you can retry, supplying another name.

Examples

The following example creates a flow monitor named FLOW-MONITOR-1 and enters Flexible NetFlow flow monitor configuration mode:

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

The following example shows the output when there is a hash collision between the name supplied and any existing name:

```
Router(config)# flow monitor FLOW-MONITOR-1
% Flow Monitor: could not create monitor.
```

Related Commands

Command	Description
clear flow monitor	Clears the flow monitor.
debug flow monitor	Enables debugging output for flow monitors.

flow platform

To configure Flexible NetFlow platform parameters, use the **flowplatform**command in global configuration mode. To unconfigure Flexible NetFlow platform parameters, use the **no** form of this command.

flow platform cache timeout {**active** *seconds* | **fast** {**threshold** *count*} {**time** *seconds*} | **inactive** *seconds*}
no flow platform cache timeout {**active** | **fast** | **inactive**}

Syntax Description

cache timeout	Configures platform flow cache timeout parameters.
active *seconds*	Configures the active flow timeout, in seconds.
fast threshold *count*	Configures the fast aging threshold packet count.
fast time *seconds*	Configures the active flow timeout, in seconds.
inactive *seconds*	Configures the inactive flow timeout, in seconds.

Command Default   Flexible NetFlow platform parameters are not configured.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(50)SY	This command was introduced.

Usage Guidelines   Hardware Flexible NetFlow table space is a valuable resource and needs to managed. Older flows need to be identified as quickly as possible and aged out (purged) to make way ultimately for new, more active flows. The older the Flexible NetFlow data, the less it is useful for real-time monitoring of traffic.

The common aging schemes are:

- Inactive/normal aging: age out flows that have had no activity in the preceding configured time.

- Active/long aging: age out flows that have lived for longer than the configured long aging period.

- Fast aging: age out flows that had some bursty activity followed by inactivity, for example, Domain Name Service (DNS) resolution requests. This aging scheme is a function of the creation time of a flow and the packet count.

- TCP session aging: age out flows pertaining to terminated TCP sessions.

- Aggressive aging: age out flows with user-configured aggressive aging inactivity timeout when table space utilization exceeds a user-configured threshold.

In addition to purging older entries, NetFlow entries need to be purged in response to certain configuration and network topology changes; for example, interface or link going out of service.

Examples   The following example configures the active platform flow cache timeout:

```
Router(config)# flow platform cache timeout active 60
```

Related Commands

Command	Description
show platform flow	Displays Flexible NetFlow platform parameter information.

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 flow 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 (config)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
15.1(2)S	This command was modified. A hash collision between the name supplied and any existing name is now possible. If this happens, you can retry, supplying another name
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines
Flexible NetFlow uses key and nonkey fields just as original NetFlow does to create and populate flows in a cache. In Flexible NetFlow a combination of key and nonkey fields is called a *record*. Original NetFlow and Flexible NetFlow both use the values in key fields in IP datagrams, such as the IP source or destination address and the source or destination transport protocol port, as the criteria for determining when a new flow must be created in the cache while network traffic is being monitored. A *flow* is defined as a stream of packets between a given source and a given destination. New flows are created whenever a packet that has a unique value in one of the key fields is analyzed.

In Cisco IOS Release 15.1(2)S and later releases, a hash collision between the name supplied and any existing name is possible. If this happens, you can retry, supplying another name.

Examples

The following example creates a flow record named FLOW-RECORD-1, and enters Flexible NetFlow flow record configuration mode:

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

The following example shows the output when there is a hash collision between the name supplied and any existing name:

```
Router(config)# flow record FLOW-RECORD-1
% Flow Record: Failure creating new Flow Record (Hash value in use).
```

Related Commands

Command	Description
show flow record	Displays flow record status and statistics.

granularity

To configure the granularity of sampling for a Flexible NetFlow sampler, use the **granularity**command in Flexible NetFlow sampler configuration mode. To return the sampling configuration to the default value, use the **no** form of this command.

granularity {**connection** | **packet**}
no granularity

Syntax Description

connection	Specifies that the sampling is done by connection.
packet	Specifies that the sampling is done by packet.

Command Default Sampling is done by packet.

Command Modes

Flexible NetFlow sampler configuration (config-sampler)

Command History

Release	Modification
Cisco IOS XE Release 3.4S	This command was introduced.

Examples The following example configures the granularity of the sampling to be by connection for a Flexible NetFlow sampler:

```
Router(config)# sampler SAMPLER-2
Router(config-sampler)# granularity connection
Router(config-sampler)# mode random 1 out-of 20
```

Related Commands

Command	Description
sampler	Configures a Flexible NetFlow sampler.

ip flow monitor

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

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

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
ip flow monitor *monitor-name* [**sampler** *sampler-name*] [{**layer2-switched** | **multicast** | **unicast**}] {**input** | **output**}
no ip flow monitor *monitor-name* [**sampler** *sampler-name*] [{**layer2-switched** | **multicast** | **unicast**}] {**input** | **output**}

Cisco IOS XE Release 3.2SE
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 a flow monitor that was previously configured.
	sampler *sampler-name*	(Optional) Enables a flow sampler for this flow monitor using the name of a sampler that was previously configured.
	layer2-switched	(Optional) Applies the flow monitor for Layer 2-switched traffic only.
	multicast	(Optional) Applies the flow monitor for multicast traffic only.
	unicast	(Optional) Applies the flow monitor for unicast traffic only.
	input	Monitors traffic that the router is receiving on the interface.
	output	Monitors traffic that the router is transmitting on the interface.

Command Default   A flow monitor is not enabled.

Command Modes

Interface configuration (config-if)
Subinterface configuration (config-subif)

Command History	**Release**	**Modification**
	12.4(9)T	This command was introduced.
	12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
	12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.

Release	Modification
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.4(22)T	This command was modified. The **unicast** and **multicast** keywords were added.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was modified. The **layer2-switched** keyword was added.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE without the support for the **multicast** and **unicast** keywords.

Usage Guidelines

You must have already created a flow monitor by using the **flow monitor** command before you can apply the flow monitor to an interface with the **ip flowmonitor** command to enable traffic monitoring with Flexible NetFlow.

ip flow monitor sampler

When a sampler is added 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 an interface. You must remove the flow monitor from the interface prior to enabling the same flow monitor with a sampler. See the "Examples" section for more information.

Note   The statistics for each flow must be scaled to give the expected true usage. For example, with a 1 in 10 sampler it is expected that the packet and byte counters will have to be multiplied by 10.

Multicast Traffic and Unicast Traffic

In Cisco IOS Release 12.4(22)T and later releases, the default behavior of the **ip flow monitor** command is to analyze unicast *and* multicast traffic. If you need to monitor only unicast traffic, use the **unicast** keyword. If you need to monitor only multicast traffic, use the **multicast** keyword.

Examples

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

```
Router(config)# interface ethernet0/0
Router(config-if)# ip flow monitor FLOW-MONITOR-1 input
```

The following example enables a flow monitor for monitoring output traffic on a subinterface:

```
Router(config)# interface ethernet0/0.1
Router(config-if)# ip flow monitor FLOW-MONITOR-1 output
```

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

```
Router(config)# interface ethernet0/0
Router(config-if)# ip flow monitor FLOW-MONITOR-1 multicast input
```

The following example enables a flow monitor for monitoring only unicast output traffic:

```
Router(config)# interface ethernet0/0
Router(config-if)# ip flow monitor FLOW-MONITOR-1 unicast output
```

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

```
Router(config)# interface ethernet0/0
Router(config-if)# ip flow monitor FLOW-MONITOR-1 input
Router(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:

```
Router(config)# interface ethernet0/0
Router(config-if)# ip flow monitor FLOW-MONITOR-1 input
Router(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:

```
Router(config)# interface ethernet0/0
Router(config-if)# ip flow monitor FLOW-MONITOR-1 input
Router(config-if)# exit
Router(config)# interface ethernet1/0
Router(config-if)# ip flow monitor FLOW-MONITOR-1 output
```

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

```
Router(config)# interface ethernet0/0
Router(config-if)# ip flow monitor FLOW-MONITOR-1 input
Router(config-if)# exit
Router(config)# interface ethernet1/0
Router(config-if)# ip flow monitor FLOW-MONITOR-2 output
```

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

```
Router(config)# interface ethernet0/0
Router(config-if)# ip flow monitor FLOW-MONITOR-1 sampler SAMPLER-1 input
```

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

```
Router(config)# interface ethernet0/0
Router(config-if)# ip flow monitor FLOW-MONITOR-1 sampler SAMPLER-1 output
```

The following example enables two different flow monitors for monitoring input and output traffic, with a sampler on the flow monitor that is monitoring input traffic to limit the input packets that are sampled:

```
Router(config)# interface ethernet0/0
Router(config-if)# ip flow monitor FLOW-MONITOR-1 sampler SAMPLER-1 input
Router(config-if)# ip flow monitor FLOW-MONITOR-2 output
```

The following example enables two different flow monitors for monitoring input and output traffic, with a sampler on the flow monitor that is monitoring output traffic to limit the output packets that are sampled:

```
Router(config)# interface ethernet0/0
Router(config-if)# ip flow monitor FLOW-MONITOR-2 input
Router(config-if)# ip flow monitor FLOW-MONITOR-2 sampler SAMPLER-2 output
```

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:

```
Router(config)# interface Ethernet0/0
Router(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:

```
Router(config)# interface Ethernet0/0
Router(config-if)# no ip flow monitor FLOW-MONITOR-1 input
Router(config-if)# ip flow monitor FLOW-MONITOR-1 sampler SAMPLER-2 input
```

The following example shows what happens when you try to remove a sampler from a flow monitor on an interface by entering the **flow monitor** command again without the **sampler** keyword and argument:

```
Router(config)# interface Ethernet0/0
Router(config-if)# ip flow monitor FLOW-MONITOR-1 input
% Flow Monitor: Flow Monitor 'FLOW-MONITOR-1' is already on in sampled mode and cannot be
enabled in full mode.
```

The following example shows how to remove the flow monitor that was enabled with a sampler from the interface so that it can be enabled without the sampler:

```
Router(config)# interface Ethernet0/0
Router(config-if)# no ip flow monitor FLOW-MONITOR-1 sampler SAMPLER-2 input
Router(config-if)# ip flow monitor FLOW-MONITOR-1 input
```

Related Commands

Command	Description
flow monitor	Creates a flow monitor.
sampler	Creates a flow sampler.

ipv6 flow monitor

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

ipv6 flow monitor *monitor-name* [**sampler** *sampler-name*] [{**multicast** | **unicast**}] {**input** | **output**}
no ipv6 flow monitor *monitor-name* [**sampler** *sampler-name*] [{**layer2-bridged**}] [{**multicast** | **unicast**}] {**input** | **output**}

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
ipv6 flow monitor *monitor-name* [**sampler** *sampler-name*] **unicast** {**input** | **output**}
no ipv6 flow monitor *monitor-name* [**sampler** *sampler-name*] [{**layer2-bridged**}] **unicast** {**input** | **output**}

Cisco IOS XE Release 3.2SE
ipv6 flow monitor *monitor-name* [**sampler** *sampler-name*] {**input** | **output**}
no ipv6 flow monitor *monitor-name* [**sampler** *sampler-name*] [{**layer2-bridged**}] {**input** | **output**}

Syntax Description

monitor-name	Name of a flow monitor that was previously configured.
sampler *sampler-name*	(Optional) Enables a flow sampler for this flow monitor using the name of a sampler that was previously configured.
multicast	(Optional) Applies the flow monitor for multicast traffic only.
unicast	(Optional) Applies the flow monitor for unicast traffic only.
input	Monitors traffic that the router is receiving on the interface.
output	Monitors traffic that the router is transmitting on the interface.
layer2-bridged	Monitors IPv6 Layer 2 Bridged traffic that the router is transmitting on the interface.

Command Default A flow monitor is not enabled.

Command Modes

Interface configuration (config-if)
Subinterface configuration (config-subif)

Command History

Release	Modification
12.4(20)T	This command was introduced.
12.4(22)T	This command was modified. The **unicast** and **multicast** keywords were added.

Release	Modification
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was modified. The **multicast** keyword was not supported.
15.1(1)SY	This command was modified. The **layer2-bridged** keyword was added.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE without the support for the **multicast** and **unicast** keywords.

Usage Guidelines

You must have already created a flow monitor by using the **flow monitor** command before you can apply the flow monitor to an interface with the **ipv6 flow monitor** command to enable traffic monitoring with Flexible NetFlow.

ipv6 flow monitor sampler

When a sampler is added 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 an interface. You must remove the flow monitor from the interface prior to enabling the same flow monitor with a sampler. See the "Examples" section for more information.

Note   The statistics for each flow must be scaled to give the expected true usage. For example, with a 1 in 10 sampler it is expected that the packet and byte counters will have to be multiplied by 10.

Multicast Traffic and Unicast Traffic

In Cisco IOS Release 12.4(22)T and later releases, the default behavior of the **ip flow monitor** command is to analyze unicast *and* multicast traffic. If you need to monitor only unicast traffic, use the **unicast** keyword. If you need to monitor only multicast traffic, use the **multicast** keyword.

Examples

The following example enables a flow monitor for monitoring input IPv6 traffic:

```
Router(config)# interface ethernet0/0
Router(config-if)# ipv6 flow monitor FLOW-MONITOR-1 input
```

The following example enables a flow monitor for monitoring output IPv6 traffic on a subinterface:

```
Router(config)# interface ethernet0/0.1
Router(config-if)# ipv6 flow monitor FLOW-MONITOR-1 output
```

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

```
Router(config)# interface ethernet0/0
Router(config-if)# ipv6 flow monitor FLOW-MONITOR-1 multicast input
```

The following example enables a flow monitor for monitoring only unicast output traffic:

```
Router(config)# interface ethernet0/0
Router(config-if)# ipv6 flow monitor FLOW-MONITOR-1 unicast output
```

The following example enables the same flow monitor on the same interface for monitoring input and output IPv6 traffic:

```
Router(config)# interface ethernet0/0
Router(config-if)# ipv6 flow monitor FLOW-MONITOR-1 input
Router(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 IPv6 traffic:

```
Router(config)# interface ethernet0/0
Router(config-if)# ipv6 flow monitor FLOW-MONITOR-1 input
Router(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 IPv6 traffic:

```
Router(config)# interface ethernet0/0
Router(config-if)# ipv6 flow monitor FLOW-MONITOR-1 input
Router(config-if)# exit
Router(config)# interface ethernet1/0
Router(config-if)# ipv6 flow monitor FLOW-MONITOR-1 output
```

The following example enables two different flow monitors on two different interfaces for monitoring input and output IPv6 traffic:

```
Router(config)# interface ethernet0/0
Router(config-if)# ipv6 flow monitor FLOW-MONITOR-1 input
Router(config-if)# exit
Router(config)# interface ethernet1/0
Router(config-if)# ipv6 flow monitor FLOW-MONITOR-2 output
```

The following example enables a flow monitor for monitoring input IPv6 traffic, with a sampler to limit the input packets that are sampled:

```
Router(config)# interface ethernet0/0
Router(config-if)# ipv6 flow monitor FLOW-MONITOR-1 sampler SAMPLER-1 input
```

The following example enables a flow monitor for monitoring output IPv6 traffic, with a sampler to limit the output packets that are sampled:

```
Router(config)# interface ethernet0/0
Router(config-if)# ipv6 flow monitor FLOW-MONITOR-1 sampler SAMPLER-1 output
```

The following example enables two different flow monitors for monitoring input and output IPv6 traffic, with a sampler on the flow monitor that is monitoring input IPv6 traffic to limit the input packets that are sampled:

```
Router(config)# interface ethernet0/0
Router(config-if)# ipv6 flow monitor FLOW-MONITOR-1 sampler SAMPLER-1 input
Router(config-if)# ipv6 flow monitor FLOW-MONITOR-2 output
```

The following example enables two different flow monitors for monitoring input and output IPv6 traffic, with a sampler on the flow monitor that is monitoring output IPv6 traffic to limit the output packets that are sampled:

```
Router(config)# interface ethernet0/0
Router(config-if)# ipv6 flow monitor FLOW-MONITOR-2 input
Router(config-if)# ipv6 flow monitor FLOW-MONITOR-2 sampler SAMPLER-2 output
```

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:

```
Router(config)# interface Ethernet0/0
Router(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:

```
Router(config)# interface Ethernet0/0
Router(config-if)# no ipv6 flow monitor FLOW-MONITOR-1 input
Router(config-if)# ipv6 flow monitor FLOW-MONITOR-1 sampler SAMPLER-2 input
```

The following example shows what happens when you try to remove a sampler from a flow monitor on an interface by entering the **flow monitor** command again without the **sampler** keyword and argument:

```
Router(config)# interface Ethernet 0/0
Router(config-if)# ipv6 flow monitor FLOW-MONITOR-1 input
% Flow Monitor: Flow Monitor 'FLOW-MONITOR-1' is already on in sampled mode and cannot be
enabled in full mode.
```

The following example shows how to remove the flow monitor that was enabled with a sampler from the interface so that it can be enabled without the sampler:

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

Related Commands

Command	Description
flow monitor	Creates a flow monitor.
sampler	Creates a flow sampler.

match application name

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

match application name
no match application name

Syntax Description

This command has no arguments or keywords.

Command Default

The application name is not configured as a key field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
15.0(1)M	This command was introduced.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples

The following example configures the application name as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match application name
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the application name as a key field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match application name
```

	Command	Description
Related Commands	**collect application name**	Configures the use of application name as a nonkey field for a Flexible NetFlow flow record.
	flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
	flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match connection id

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

match connection id
no match connection id

Syntax Description	This command has no arguments or keywords.
Command Default	The use of the connection ID as a key field for a user-defined flow record is not enabled.
Command Modes	flow record configuration (config-flow-record)

Command History

Release	Modification
Cisco IOS Release XE 3.9S	This command was introduced.

Usage Guidelines

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

Examples

The following example configures the connection ID as a key field:

```
Router(config)# flow record RECORD-4
Router(config-flow-record)# match connection id
```

Related Commands

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

match connection transaction-id

To configure the transaction ID as a key field for a flow record, use the **match connection transaction-id** command in flow record configuration mode. To disable the use of a transaction ID field as a key field for a flow record, use the **no** form of this command.

match connection transaction-id
no match connection transaction-id

Syntax Description   This command has no arguments or keywords.

Command Default   The use of the transaction ID as a key field for a user-defined flow record is not enabled.

Command Modes   Flow record configuration (config-flow-record)

Command History

Release	Modification
Cisco IOS XE 3.4S	This command was introduced.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines   This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

The transaction ID identifies a transaction within a connection. A transaction is a meaningful exchange of application data between two network devices or a client and server. A transaction ID is assigned the first time a flow is reported, so that later reports for the same flow will have the same transaction ID. A different transaction ID is used for each transaction within a TCP or UDP connection. The identifiers are not required to be sequential.

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

The transaction ID field is used to specify the transaction within the connection, for protocols where multiple transactions are used. The field is composed of the CFT-flow ID/pointer (the most significant bit) and the transaction counter within the connection specified by NBAR (least significant bit).

Examples   The following example configures the transaction ID as a key field:

```
Router(config)# flow record RECORD-4
Router(config-flow-record)# match connection transaction-id
```

Cisco Performance Monitor in Cisco IOS XE Release 3.5S

The following example configures the transaction ID as a key field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match connection transaction-id
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match datalink dot1q priority

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

match datalink dot1q priority
no match datalink dot1q priority

Command Default

The 802.1Q priority is not configured as a key field.

Command Modes

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

Command History

Release	Modification
Cisco IOS XE Release 3.2SE	This command was introduced. Only the switch ports support it.

Usage Guidelines

The Flexible NetFlow **match** commands are used to configure key fields for the flow monitor record and to enable capturing the values in the fields for the flow created with the record.

Example

The following example configures the 802.1Q priority of traffic being received by the router as a key field for a Flexible NetFlow flow record

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

Related Commands

Command	Description
flow record	Creates a flow record.

match datalink dot1q vlan

To configure the 802.1Q (dot1q) VLAN value as a key field for a Flexible NetFlow flow record, use the **match datalink dot1q vlan** command in Flexible NetFlow flow record configuration mode. To disable the use of the 802.1Q VLAN value as a key field for a Flexible NetFlow 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 802.1Q VLAN ID of traffic being received by the router as a key field.
output	Configures the 802.1Q VLAN ID of traffic being transmitted by the router as a key field.

Command Default

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

Command Modes

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

Command History

Release	Modification
12.4(22)T	This command was introduced.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE. Only the switch ports support it.

Usage Guidelines

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. For example, when you configure a flow record with the **match datalink dot1q vlan input** command to monitor the simulated denial of service (DoS) attack in the figure below and apply the flow monitor to which the flow record is assigned in either input (ingress) mode on Ethernet interface 0/0.1 on R3 or output (egress) mode on Ethernet interface 1/0.1 on R3, the observation point is always Ethernet 0/0.1 on R3. The 802.1q VLAN ID that is used as a key field is 5.

Figure 27: Simulated DoS Attack (c)
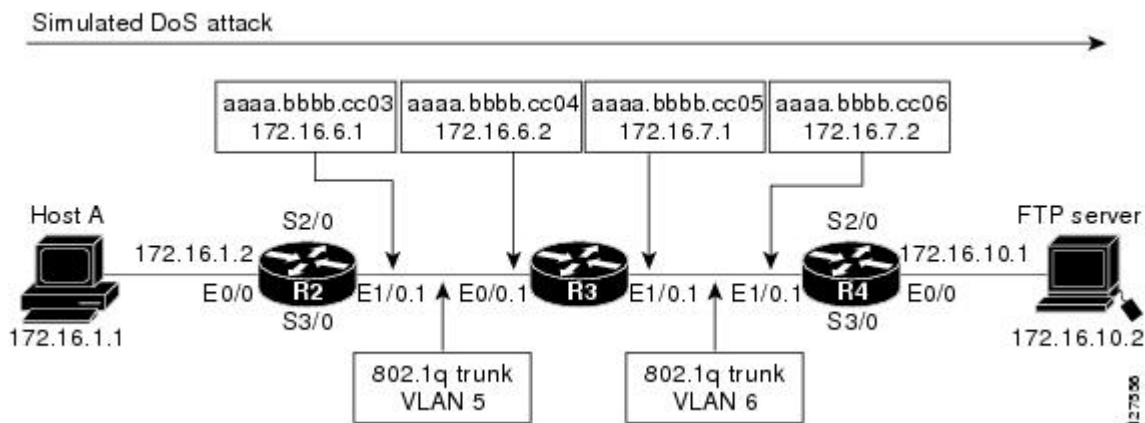
The observation point of **match** commands that do not have the input and/or output keywords is always the interface to which the flow monitor that contains the flow record with the **match** commands is applied.

Examples

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

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

Related Commands

Command	Description
flow record	Creates a flow record.

match datalink ethertype

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

match datalink ethertype
no match datalink ethertype

Command Default   The ethertype is not configured as a key field.

Command Modes

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

Command History

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

Usage Guidelines   The Flexible NetFlow **match** commands are used to configure key fields for the flow monitor record and to enable capturing the values in the fields for the flow created with the record.

Example

The following example configures the ethertype of traffic being received by the router as a key field for a Flexible NetFlow flow record

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

Related Commands

Command	Description
flow record	Creates a flow record.

match datalink mac

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

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

Syntax Description

destination address	Configures the use of the destination MAC address as a key field.
source address	Configures the use of the source MAC address as a key field.
input	Packets received by the router.
output	Packets transmitted by the router.

Command Default

MAC addresses are not configured as a key field.

Command Modes

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

Command History

Release	Modification
12.4(22)T	This command was introduced.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines

The **input** and **output** keywords of the **match datalink mac** command 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. For example, when you configure a flow record with the **match datalink mac destination address input** command to monitor the simulated denial of service (DoS) attack in the figure below and apply the flow monitor to which the flow record is assigned in either input (ingress) mode on Ethernet interface 0/0.1 on R3 or output (egress) mode on Ethernet interface 1/0.1 on R3, the observation point is always Ethernet 0/0.1 on R3. The destination MAC address that is used a key field is aaaa.bbbb.cc04.

Figure 28: Simulated DoS Attack (d)

When the destination output mac address is configured, the value is the destination mac address of the output packet, even if the monitor the flow record is applied to is input only.

When the destination input mac address is configured, the value is the destination mac address of the input packet, even if the monitor the flow record is applied to is output only.

When the source output mac address is configured, the value is the source mac address of the output packet, even if the monitor the flow record is applied to is input only.

When the source input mac address is configured, the value is the source mac address of the input packet, even if the monitor the flow record is applied to is output only.

Examples

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

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

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

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

Related Commands

Command	Description
flow record	Creates a flow record.

match datalink vlan

To configure the VLAN ID as a key field for a Flexible NetFlow flow record, use the **match datalink vlan** command in Flexible NetFlow flow record configuration mode. To disable the use of the VLAN ID value as a key field for a Flexible NetFlow 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 router as a key field.
output	Configures the VLAN ID of traffic being transmitted by the router as a key field.

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

Command Modes

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

Command History

Release	Modification
12.2(50)SY	This command was introduced.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE. Only the switch ports support it.

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

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

Related Commands

Command	Description
flow record	Creates a flow record.

match flow

To configure the flow direction and the flow sampler ID number as key fields for a flow record, use the **match flow** command in Flexible NetFlow flow record configuration or policy inline configuration mode. To disable the use of the flow direction and the flow sampler ID number as key fields for a flow record, use the **no** form of this command.

match flow {**direction** | **sampler**}
no match flow {**direction** | **sampler**}

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY and 15.1(1)SY
match flow {**cts** {**destination** | **source**} **group-tag** | **direction**}
no match flow {**cts** {**destination** | **source**} **group-tag** | **direction**}

Syntax Description		
	direction	Configures the direction in which the flow was monitored as a key field.
	sampler	Configures the flow sampler ID as a key field.
	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-spolicy-inline)

Command History	Release	Modification
	12.4(9)T	This command was introduced.
	12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
	12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
	12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
	12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
	15.1(3)T	This command was integrated into Cisco IOS Release 15.1(3)T for Cisco Performance Monitor. Support was added for policy inline configuration mode.
	12.2(58)SE	This command was modified. Support for the Cisco Performance Monitor was added.

Release	Modification
12.2(50)SY	This command was modified. The **cts destination group-tag** and **cts source group-tag** keywords were added. The **sampler** keyword was removed.
15.1(1)SY	This command was modified. Support for the Cisco Performance Monitor was added.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE without the support for the **sampler** keyword.

Usage Guidelines   This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command.

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

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE

You must first enter the **service-policy type performance-monitor inline** command.

match flow direction

This field indicates the direction of the flow. This is of most use 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 field may also be used to match up pairs of flows in the exported data when the two flows are flowing in opposite directions.

match flow sampler

This field contains the ID of the flow sampler used to monitor the flow. This is useful when more than one flow sampler is being used with different sampling rates. The flow exporter **option sampler-table** command will export options records with mappings of the flow sampler ID to the sampling rate so the collector can calculate the scaled counters for each flow.

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

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

The following example configures the flow sampler ID as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match flow sampler
```

The following example configures the CTS destination fields group as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match flow cts destination group-tag
```

The following example configures the CTS source fields group as a key field:

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

The following example shows how to use the policy inline configuration mode to configure a service policy for Performance Monitor. The policy specifies that packets traversing Ethernet interface 0/0 that match the flow sampler ID will be monitored based on the parameters specified in the flow monitor configuration named fm2:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# match flow sampler
Router(config-if-spolicy-inline)# flow monitor fm-2
Router(config-if-spolicy-inline)# exit
```

Related Commands

Command	Description
class-map	Creates a class map to be used for matching packets to a specified class.
flow exporter	Creates a flow exporter.
flow record	Creates a flow record.
service-policy type performance-monitor	Associates a Performance Monitor policy with an interface.

match interface (Flexible NetFlow) through ttl (Flexible NetFlow)

match interface (Flexible NetFlow)

To configure input and output interfaces as key fields for a flow record, use the **match interface** command in Flexible NetFlow 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**}

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
match interface {**input** [**physical**] | **output**} [**snmp**]
no match interface {**input** [**physical**] | **output**} [**snmp**]

Syntax Description

input	Configures the input interface as a key field.
physical	(Optional) Configures the physical input interface as a key field and enables collecting the input interface from the flows.
output	Configures the output interface as a key field.
snmp	(Optional) Configures the simple network management protocol (SNMP) index of the input interface as a key field.

Command Default

The input and output interfaces are not configured as key fields.

Command Modes

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

Command History

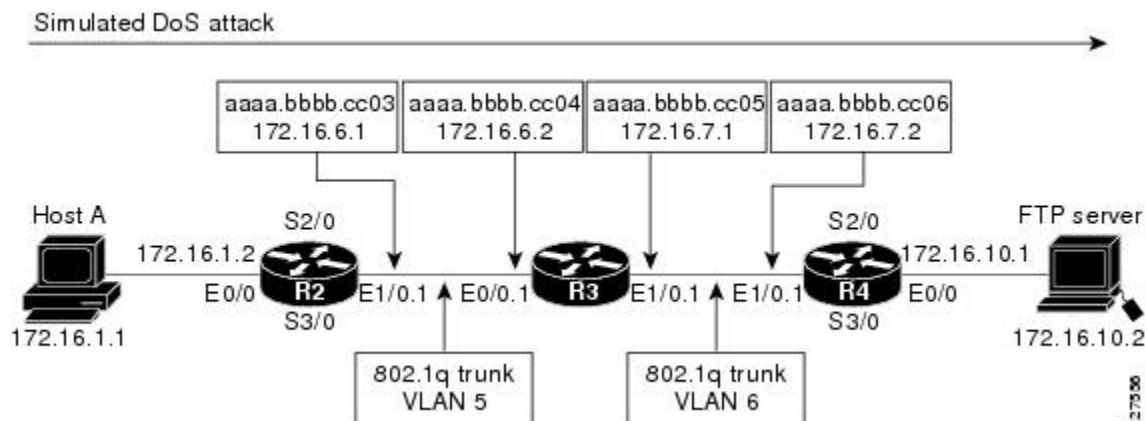| Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was modified. The **physical** and **snmp** keywords were added.
15.2(2)T	This command was modified. Support for the Cisco Performance Monitor was added.
Cisco IOS XE Release 3.5S	This command was modified. Support for the Cisco Performance Monitor was added.

Release	Modification
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples

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

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

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

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

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

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match interface output
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match ipv4

To configure one or more of the IPv4 fields as a key field for a flow record, use the **match ipv4** command in Flexible NetFlow 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 {**dscp** | **header-length** | **id** | **option map** | **precedence** | **protocol** | **tos** | **version**}
no match ipv4 {**dscp** | **header-length** | **id** | **option map** | **precedence** | **protocol** | **tos** | **version**}

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE
match ipv4 protocol
no match ipv4 protocol

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
match ipv4 {**dscp** | **precedence** | **protocol** | **tos**}
no match ipv4 {**dscp** | **precedence** | **protocol** | **tos**}

Cisco IOS XE Release 3.2SE
match ipv4 {**protocol** | **tos** | **version**}
match ipv4 {**protocol** | **tos** | **version**}

Syntax Description

dscp	Configures the IPv4 differentiated services code point (DSCP) (part of type of service [ToS]) as a key field.
header-length	Configures the IPv4 header length (in 32-bit words) as a key field.
id	Configures the IPv4 ID as a key field.
option map	Configures the bitmap representing which IPv4 options have been seen as a key field.
precedence	Configures the IPv4 precedence (part of ToS) as a key field.
protocol	Configures the IPv4 protocol as a key field.
tos	Configures the IPv4 ToS as a key field.
version	Configures the IP version from IPv4 header as a key field.

Command Default

The use of one or more of the IPv4 fields as a key field for a user-defined flow record is not enabled by default.

Command Modes

flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.

Release	Modification
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
15.1(3)T	This command was modified for the Cisco Performance Monitor. The **dscp**, **header-length**, **id**, **option map**, **precedence**, **tos**, and **version** keywords were removed.
12.2(58)SE	This command was modified for the Cisco Performance Monitor. The **dscp**, **header-length**, **id**, **option map**, **precedence**, **tos**, and **version** keywords were removed.
12.2(50)SY	This command was modified. The **header-length**, **id**, **option**, **map**, and **version** keywords were not supported in Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was modified. The **dscp**, **header-length**, **id**, **option map**, and **precedence** keywords were removed.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command.

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

> **Note**
>
> Some of the keywords of the **match ipv4** command are documented as separate commands. All of the keywords for the **match ipv4** command that are documented separately start with **match ipv4**. For example, for information about configuring the IPv4 time-to-live (TTL) field as a key field for a flow record, refer to the **match ipv4 ttl** command.

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE

Only the **protocol** keyword is available. You must first enter the**flow record type performance-monitor** command.

Examples

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

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv4 dscp
```

The following example configures the IPv4 DSCP field as a key field for Cisco Performance Monitor:

```
Router(config)# flow record type performance-monitor FLOW-RECORD-1
Router(config-flow-record)# match ipv4 dscp
```

Related Commands

Command	Description
flow record	Creates a flow record.
flow record type performance-monitor	Creates a flow record for Cisco Performance Monitor.

match ipv4 destination

To configure the IPv4 destination address as a key field for a flow record, use the **match ipv4 destination** command in Flexible NetFlow 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** | {**mask** | **prefix**} [{**minimum-mask** *mask*}]}
no match ipv4 destination {**address** | {**mask** | **prefix**} [{**minimum-mask** *mask*}]}

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE
match ipv4 destination {**address** | **prefix** [**minimum-mask** *mask*]}
no match ipv4 destination {**address** | **prefix** [**minimum-mask** *mask*]}

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
match ipv4 destination address
no match ipv4 destination address

Cisco IOS XE Release 3.2SE
match ipv4 destination address
no match ipv4 destination address

Syntax Description

address	Configures the IPv4 destination address as a key field.
mask	Configures the mask for the IPv4 destination address as a key field.
prefix	Configures the prefix for the IPv4 destination address as a key field.
minimum-mask *mask*	(Optional) Specifies the size, in bits, of the minimum mask. The range is 1 to 32.

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

Command Modes

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

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Gigabit Switch Router (GSR).
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.

Release	Modification
15.1(3)T	This command was modified for the Cisco Performance Monitor. The **mask** keyword was removed.
12.2(58)SE	This command was modified for the Cisco Performance Monitor. The **mask** keyword was removed.
12.2(50)SY	This command was modified. The **mask**, **prefix**, and **minimum-mask** keywords were removed.
Cisco IOS XE Release 3.2SE	This command was modified. The **mask**, **prefix**, and **minimum-mask** keywords were removed.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command.

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

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE

The **mask** keyword is not available. You must first enter the **flow record type performance-monitor** command.

Examples

The following example configures a 16-bit IPv4 destination address prefix as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv4 destination prefix minimum-mask 16
```

The following example specifies a 16-bit IPv4 destination address mask as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv4 destination mask minimum-mask 16
```

The following example specifies a 16-bit IPv4 destination address mask as a key field for Cisco Performance Monitor:

```
Router(config)# flow record type performance-monitor FLOW-RECORD-1
Router(config-flow-record)# match ipv4 destination mask minimum-mask 16
```

Related Commands

Command	Description
flow record	Creates a flow record.
flow record type performance-monitor	Creates a flow record for Cisco Performance Monitor.

match ipv4 fragmentation

To configure the IPv4 fragmentation flags and the IPv4 fragmentation offset as key fields for a flow record, use the **match ipv4 fragmentation** command in flow record configuration mode. To disable the use of the IPv4 fragmentation flags and the IPv4 fragmentation offset as key fields for a flow record, use the **no** form of this command.

match ipv4 fragmentation {**flags** | **offset**}
no match ipv4 fragmentation {**flags** | **offset**}

Syntax Description

flags	Configures the IPv4 fragmentation flags as a key field.
offset	Configures the IPv4 fragmentation offset as a key field.

Command Default

The IPv4 fragmentation flags and the IPv4 fragmentation offset arenot configured as key fields.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	Support for this command was added for Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

match ipv4 fragmentation flags

This field matches the "don't fragment" and "more fragments" flags.

Bit 0: reserved, must be zero

Bit 1: (DF) 0 = May Fragment, 1 = Don't Fragment

Bit 2: (MF) 0 = Last Fragment,1 = More Fragments

Bits 3-7: (DC) Don't Care, value is irrelevant

```
  0   1   2   3   4   5   6   7
+---+---+---+---+---+---+---+---+
|   | D | M | D | D | D | D | D |
| 0 | F | F | C | C | C | C | C |
+---+---+---+---+---+---+---+---+
```

For more information on IPv4 fragmentation flags, see RFC 791, *Internet Protocol* at the following URL: http://www.ietf.org/rfc/rfc791.txt .

Examples

The following example configures the IPv4 fragmentation flags as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv4 fragmentation flags
```

The following example configures the IPv4 offset flag as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv4 fragmentation offset
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the IPv4 offset flag as a key field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match ipv4 fragmentation offset
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match ipv4 section

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

match ipv4 section {**header size** *header-size* | **payload size** *payload-size*}
no match ipv4 section {**header size** *header-size* | **payload size** *payload-size*}

Syntax Description

header size *header-size*	Configures the number of bytes of raw data starting at the IPv4 header, to use as a key field. Range: 1 to 1200
payload size *payload-size*	Configures the number of bytes of raw data starting at the IPv4 payload, to use as a key field. Range: 1 to 1200

Command Default

A section of an IPv4 packet is not configured as a key field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	Support for this command was added for Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

match ipv4 section header

This command uses the section of the IPv4 header indicated by the **header size***header-size* keyword and argument as a key field. Only the configured size in bytes will be matched, and part of the payload will also be matched if the configured size is larger than the size of the header.

Note   This command can result in large records that use a large amount of router memory and export bandwidth.

match ipv4 section payload

This command uses the section of the IPv4 payload indicated by the **payload size***payload-size* keyword and argument as a key field.

Note   This command can result in large records that use a large amount of router memory and export bandwidth.

Examples

The following example configures the first four bytes (the IPv4 version field) as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv4 section header size 4
```

The following example configures the first 16 bytes from the payload of the IPv4 packets in the flow as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv4 section payload size 16
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the first 16 bytes from the payload of the IPv4 packets in the flow as a key field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match ipv4 section payload size 16
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match ipv4 source

To configure the IPv4 source address as a key field for a flow record, use the **match ipv4 source** command in Flexible NetFlow 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** | {**mask** | **prefix**} [{**minimum-mask** *mask*}]}
no match ipv4 source {**address** | {**mask** | **prefix**} [{**minimum-mask** *mask*}]}

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE
match ipv4 source {**address** | **prefix** [**minimum-mask** *mask*]}
no match ipv4 source {**address** | **prefix** [**minimum-mask** *mask*]}

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
match ipv4 source address
no match ipv4 source address

Cisco IOS XE Release 3.2SE
match ipv4 source address
no match ipv4 source address

Syntax Description

address	Configures the IPv4 source address as a key field.
mask	Configures the mask for the IPv4 source address as a key field.
prefix	Configures the prefix for the IPv4 source address as a key field.
minimum-mask *mask*	(Optional) Specifies the size, in bits, of the minimum mask. Range: 1 to 128.

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

Command Modes

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

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
15.1(3)T	This command was modified for the Cisco Performance Monitor. The **mask** keyword was removed.

Release	Modification
12.2(58)SE	This command was modified for the Cisco Performance Monitor. The **mask** keyword was removed.
12.2(50)SY	This command was modified. The **mask**, **prefix**, and **minimum-mask** keywords were removed.
Cisco IOS XE Release 3.2SE	This command was modified. The **mask**, **prefix**, and **minimum-mask** keywords were removed.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command.

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

Cisco Performance Monitor in Cisco IOS Release 15.1(3)T and 12.2(58)SE

The **mask** keyword is not available. You must first enter the **flow record type performance-monitor** command.

match ipv4 source prefix minimum-mask

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

match ipv4 source mask minimum-mask

The source address mask is the number of bits that make up the network part of the source address. 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 knows 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 configures a 16-bit IPv4 source address prefix as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv4 source prefix minimum-mask 16
```

The following example specifies a 16-bit IPv4 source address mask as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv4 source mask minimum-mask 16
```

The following example specifies a 16-bit IPv4 source address mask as a key field for Cisco Performance Monitor:

```
Router(config)# flow record type performance-monitor FLOW-RECORD-1
Router(config-flow-record)# match ipv4 source mask minimum-mask 16
```

Related Commands	Command	Description
	flow record	Creates a flow record.
	flow record type performance-monitor	Creates a flow record for Cisco Performance Monitor.

match ipv4 total-length

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

match ipv4 total-length
no match ipv4 total-length

Syntax Description   This command has no arguments or keywords.

Command Default   The IPv4 total-length field is not configured as a key field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	Support for this command was added for Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines   This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

A flow record requires at least one key field before it can be used in a flow monitor. The key fields differentiate flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.
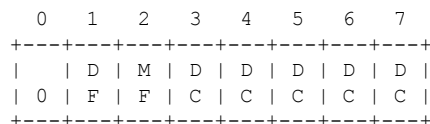
Examples   The following example configures the total-length value as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv4 total-length
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the total-length value as a key field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match ipv4 total-length
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

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

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was modified. Support for the Cisco Performance Monitor was added.
Cisco IOS XE Release 3.5S	This command was modified. Support for the Cisco Performance Monitor was added.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines   This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples

The following example configures IPv4 TTL as a key field:

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

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

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match ipv4 ttl
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match ipv6

To configure one or more of the IPv6 fields as a key field for a flow record, use the **match ipv6** command in Flexible NetFlow 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 {**dscp** | **flow-label** | **next-header** | **payload-length** | **precedence** | **protocol** | **traffic-class** | **version**}
no match ipv6 {**dscp** | **flow-label** | **next-header** | **payload-length** | **precedence** | **protocol** | **traffic-class** | **version**}

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
match ipv6 {**dscp** | **precedence** | **protocol** | **tos**}
no match ipv6 {**dscp** | **precedence** | **protocol** | **tos**}

Cisco IOS XE Release 3.2SE
match ipv6 {**protocol** | **traffic-class** | **version**}
no match ipv6 {**protocol** | **traffic-class** | **version**}

Syntax Description		
	dscp	Configures the IPv6 differentiated services code point DSCP (part of type of service (ToS)) as a key field.
	flow-label	Configures the IPv6 flow label as a key field.
	next-header	Configures the IPv6 next header as a key field.
	payload-length	Configures the IPv6 payload length as a key field.
	precedence	Configures the IPv6 precedence (part of ToS) as a key field.
	protocol	Configures the IPv6 protocol as a key field.
	tos	Configures the IPv6 ToS as a key field.
	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

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

Command History	Release	Modification
	12.4(20)T	This command was introduced.
	12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.

Release	Modification
12.2(50)SY	This command was modified. The **flow-label**, **next-header**, **payload-length,traffic-class**, and **version** keywords were removed.
15.2(2)T	This command was modified. Support for the Cisco Performance Monitor was added.
Cisco IOS XE Release 3.5S	This command was modified. Support for the Cisco Performance Monitor was added.
Cisco IOS XE Release 3.2SE	This command was modified. The **dscp**, **flow-label**, **next-header**, **payload-length**, and **precedence** keywords were removed.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Note

Some of the keywords of the **match ipv6** command are documented as separate commands. All of the keywords for the **match ipv6** command that are documented separately start with **match ipv6**. For example, for information about configuring the IPv6 hop limit as a key field for a flow record, refer to the **match ipv6 hop-limit** command.

Examples

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

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv6 dscp
```

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

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match ipv6 dscp
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match ipv6 destination

To configure the IPv6 destination address as a key field for a flow record, use the **match ipv6 destination** command in Flexible Netflow 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** | {**mask** | **prefix**} [**minimum-mask** *mask*]}
no match ipv6 destination {**address** | {**mask** | **prefix**} [**minimum-mask** *mask*]}

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
match ipv6 destination address
no match ipv6 destination address

Cisco IOS XE Release 3.2SE
match ipv6 destination address
no match ipv6 destination address

Syntax Description

address	Configures the IPv6 destination address as a key field.
mask	Configures the mask for the IPv6 destination address as a key field.
prefix	Configures the prefix for the IPv6 destination address as a key field.
minimum-mask *mask*	(Optional) Specifies the size, in bits, of the minimum mask. Range: 1 to 128.

Command Default

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

Command Modes

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

Command History

Release	Modification
12.4(20)T	This command was introduced.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was modified. The **mask**, **prefix**, and **minimum-mask** keywords were removed.
15.2(2)T	This command was modified. Support for the Cisco Performance Monitor was added.
Cisco IOS XE Release 3.5S	This command was modified. Support for the Cisco Performance Monitor was added.
Cisco IOS XE Release 3.2SE	This command was modified. The **mask**, **prefix**, and **minimum-mask** keywords were removed.

Usage Guidelines	This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples	The following example configures a 16-bit IPv6 destination address prefix as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv6 destination prefix minimum-mask 16
```

The following example specifies a 16-bit IPv6 destination address mask as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv6 destination mask minimum-mask 16
```

The following example configures a 16-bit IPv6 destination address mask as a key field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match ipv6 destination mask minimum-mask 16
```

Related Commands	

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match ipv6 extension map

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

match ipv6 extension map
no match ipv6 extension map

Syntax Description	This command has no arguments or keywords.
Command Default	The use of the bitmap of the IPv6 extension header map as a key field for a user-defined flow record is not enabled by default.
Command Modes	Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(20)T	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Bitmap of the IPv6 Extension Header Map

The bitmap of IPv6 extension header map is made up of 32 bits.

```
    0     1     2     3     4     5     6     7
+-----+-----+-----+-----+-----+-----+-----+-----+
| Res | FRA1| RH  | FRA0| UNK | Res | HOP | DST |
+-----+-----+-----+-----+-----+-----+-----+-----+
```

```
    8     9    10    11    12    13    14    15
+-----+-----+-----+-----+-----+-----+-----+-----+
| PAY | AH  | ESP |         Reserved          |
+-----+-----+-----+-----+-----+-----+-----+-----+
   16    17    18    19    20    21    22    23
+-----+-----+-----+-----+-----+-----+-----+-----+
|                 Reserved                      |
+-----+-----+-----+-----+-----+-----+-----+-----+
   24    25    26    27    28    29    30    31
+-----+-----+-----+-----+-----+-----+-----+-----+
|                 Reserved                      |
+-----+-----+-----+-----+-----+-----+-----+-----+
0  Res  Reserved
1  FRA1 Fragmentation header - not first fragment
2  RH   Routing header
3  FRA0 Fragment header - first fragment
4  UNK  Unknown Layer 4 header
        (compressed, encrypted, not supported)
5  Res  Reserved
6  HOP  Hop-by-hop option header
7  DST  Destination option header
8  PAY Payload compression header
9  AH  Authentication Header
10 ESP Encrypted security payload
11 to 31 Reserved
```

For more information on IPv6 headers, refer to RFC 2460 *Internet Protocol, Version 6 (IPv6)* at the following URL: http://www.ietf.org/rfc/rfc2460.txt .

Examples

The following example configures the IPv6 bitmap of the IPv6 extension header map of the packets in the flow as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv6 extension map
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the IPv6 bitmap of the IPv6 extension header map of the packets in the flow as a key field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match ipv6 extension map
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match ipv6 fragmentation

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

match IPv6 fragmentation {**flags** | **id** | **offset**}
no match IPv6 fragmentation {**flags** | **id** | **offset**}

Syntax Description

flags	Configures the IPv6 fragmentation flags as a key field.
id	Configures the IPv6 fragmentation ID as a key field.
offset	Configures the IPv6 fragmentation offset value as a key field.

Command Default

The IPv6 fragmentation field is not configured as a key field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(20)T	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples

The following example configures the IPv6 fragmentation flags a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv6 fragmentation flags
```

The following example configures the IPv6 offset value a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv6 fragmentation offset
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the IPv6 offset value as a key field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match ipv6 fragmentation offset
```

Related Commands	Command	Description
	flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
	flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match 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 Flexible NetFlow 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

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

Command History

Release	Modification
12.4(20)T	This command was introduced.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was modified. Support for the Cisco Performance Monitor was added.
Cisco IOS XE Release 3.5S	This command was modified. Support for the Cisco Performance Monitor was added.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines   This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

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

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

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

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match ipv6 hop-limit
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match ipv6 length

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

match ipv6 length {**header** | **payload** | **total**}
no match ipv6 length {**header** | **payload** | **total**}

Syntax Description

header	Configures the length in bytes of the IPv6 header, not including any extension headers as a key field.
payload	Configures the length in bytes of the IPv6 payload, including any extension header as a key field.
total	Configures the total length in bytes of the IPv6 header and payload as a key field.

Command Default

The IPv6 length field is not configured as a key field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(20)T	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples

The following example configures the length of the IPv6 header in bytes, not including any extension headers, as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv6 length header
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the length of the IPv6 header in bytes, not including any extension headers, as a key field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match ipv6 length header
```

Related Commands	**Command**	**Description**
	flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
	flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match ipv6 section

To configure a section of an IPv6 packet as a key field for a flow record, use the **match ipv6 section** 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 section {**header size** *header-size* | **payload size** *payload-size*}
no match ipv6 section {**header size** *header-size* | **payload size** *payload-size*}

Syntax Description	**header size** *header-size*	Configures the number of bytes of raw data starting at the IPv6 header, to use as a key field. Range: 1 to 1200
	payload size *payload-size*	Configures the number of bytes of raw data starting at the IPv6 payload, to use as a key field. Range: 1 to 1200

Command Default A section of an IPv6 packet is not configured as a key.

Command Modes

Flow record configuration (config-flow-record)

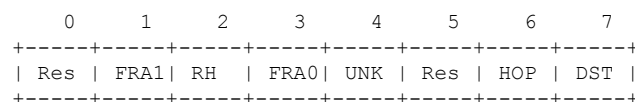| Command History	Release	Modification
	12.4(20)T	This command was introduced.
	12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
	15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
	Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

match ipv6 section header

This command uses the section of the IPv6 header indicated by the **headersize***header-size* keyword and argument as a key field. Only the configured size in bytes will be matched, and part of the payload will also be matched if the configured size is larger than the size of the header.

✎

Note This command can result in large records that use a large amount of router memory and export bandwidth.

match ipv6section payload

This command uses the section of the IPv6 payload indicated by the **payloadsize***payload-size* keyword and argument as a key field.

✎

Note This command can result in large records that use a large amount of router memory and export bandwidth.

Examples

The following example configures the first four bytes (the IP version field) from the IPv6 header of the packets in the flows as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv6 section header size 4
```

The following example configures the first 16 bytes from the payload of the IPv6 packets in the flows as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv6 section payload size 16
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the first 16 bytes from the payload of the IPv6 packets in the flows as a key field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match ipv6 section payload size 16
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match ipv6 source

To configure the IPv6 source address as a key field for a flow record, use the **match ipv6 source** command in Flexible NetFlow 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** | {**mask** | **prefix**} [**minimum-mask** *mask*]}
no match ipv6 source {**address** | {**mask** | **prefix**} [**minimum-mask** *mask*]}

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
match ipv6 source address
no match ipv6 source address

Cisco IOS XE Release 3.2SE
match ipv6 source address
no match ipv6 source address

Syntax Description

address	Configures the IPv6 source address as a key field.
mask	Configures the mask for the IPv6 source address as a key field.
prefix	Configures the prefix for the IPv6 source address as a key field.
minimum-mask *mask*	(Optional) Specifies the size, in bits, of the minimum mask. Range: 1 to 128.

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

Command Modes

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

Command History

Release	Modification
12.4(20)T	This command was introduced.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was modified. The **mask**, **prefix**, and **minimum-mask** keywords were removed.
15.2(2)T	This command was modified. Support for the Cisco Performance Monitor was added.
Cisco IOS XE Release 3.5S	This command was modified. Support for the Cisco Performance Monitor was added.
Cisco IOS XE Release 3.2SE	This command was modified. The **mask**, **prefix**, and **minimum-mask** keywords were removed.

Usage Guidelines	This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples	The following example configures a 16-bit IPv6 source address prefix as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv6 source prefix minimum-mask 16
```

The following example specifies a 16-bit IPv6 source address mask as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match ipv6 source mask minimum-mask 16
```

The following example configures the 16-bit IPv6 source address mask as a key field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match ipv6 source mask minimum-mask 16
```

Related Commands	**Command**	**Description**
	flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
	flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match mpls label

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

match mpls {**label 1** | {**details** | **exp** | **ttl**} | **label 2** | {**details**} | **label 3** | {**details**} | **label 4** | {**details**} | **label 5** | {**details**} | **label 6** | {**details**}}
no match mpls {**label 1** | {**details** | **exp** | **ttl**} | **label 2** | {**details**} | **label 3** | {**details**} | **label 4** | {**details**} | **label 5** | {**details**} | **label 6** | {**details**}}

Syntax Description

label 1	Configures the first MPLS label as a nonkey field.
details	Configures the details of the MPLS label as a nonkey field.
exp	Configures the MPLS experimental level field as a nonkey field.
ttl	Configures the time-to-life (TTL) for the MPLS label as a nonkey field.
label 2	Configures the second MPLS label as a nonkey field.
label 3	Configures the third MPLS label as a nonkey field.
label 4	Configures the fourth MPLS label as a nonkey field.
label 5	Configures the fifth MPLS label as a nonkey field.
label 6	Configures the sixth MPLS label as a nonkey field.

Command Default MPLS label fields are not configured as a key field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
Cisco IOS XE Release 3.9S	This command was introduced.

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

Examples The following example configures the details of the first MPLS label as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match mpls label 1 details
```

Related Commands

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

match routing

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

match routing {**destination** | **source**} [{**as** [{**4-octet** | **peer** [**4-octet**]}] | **traffic-index** | **forwarding-status** | **next-hop address** {**ipv4** | **ipv6**} [**bgp**] | **vrf input** | **vrf output**}]
no match routing {**destination** | **source**} [{**as** [{**4-octet** | **peer** [**4-octet**]}] | **traffic-index** | **forwarding-status** | **next-hop address** {**ipv4** | **ipv6**} [**bgp**] | **vrf input** | **vrf output**}]

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
match routing vrf input
no match routing vrf input

Syntax Description

destination	Specifies one or more of the destination routing attributes fields as a key field.
source	Specifies one or more of the source routing attributes fields as a key field.
as	Configures the autonomous system field as a key field.
4-octet	(Optional) Configures the 32-bit autonomous system number as a key field.
peer	(Optional) Configures the autonomous system number of the peer network as a key field.
traffic-index	Configures the Border Gateway Protocol (BGP) destination traffic index as a key field.
forwarding-status	Configures the forwarding status of the packet as a key field.
next-hop address	Configures the next-hop address value as a key field. The type of address (IPv4 or IPv6) is determined by the next keyword entered.
ipv4	Specifies that the next-hop address value is an IPv4 address.
ipv6	Specifies that the next-hop address value is an IPv6 address.
bgp	(Optional) Configures the IPv4 address of the BGP next hop as a key field.
vrf input	Configures the virtual routing and forwarding (VRF) ID for incoming packets as a key field.
vrf output	Configures the virtual routing and forwarding (VRF) ID for outgoing packets as a key field.

Command Default

The use of one or more of the routing fields as a key field for a user-defined flow record is disabled.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	Support for this command was added for Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.
12.4(20)T	**ipv6** keyword was added.
15.0(1)M	This command was modified. The **vrf input** keywords were added.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.
Cisco IOS Release XE 3.2S	This command was modified. The **4-octet** keyword was added.
12.2(50)SY	This command was modified. The **vrf input** keywords are the only keywords supported in Cisco IOS Release 12.2(50)SY.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.
Cisco IOS XE Release 3.8S	This command was modified. The **vrf output** keywords were added.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command; however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

match routing source as [peer]

This command matches the 16-bit autonomous system number based on a lookup of the router's routing table using the source IP address. The optional **peer** keyword provides the expected next network, as opposed to the originating network.

match routing source as [peer [4-octet]]

This command matches the 32-bit autonomous system number based on a lookup of the router's routing table using the source IP address. The optional **peer** keyword provides the expected next network, as opposed to the originating network.

match routing destination as [peer]

This command matches the 16-bit autonomous system number based on a lookup of the router's routing table using the destination IP address. The **peer** keyword provides the expected next network, as opposed to the destination network.

match routing destination as [peer [4-octet]]

This command matches the 32-bit autonomous system number based on a lookup of the router's routing table using the destination IP address. The **peer** keyword provides the expected next network, as opposed to the destination network.

match routing destination traffic-index

This command matches the traffic-index field based on the destination autonomous system for this flow. The traffic-index field is a value propagated through BGP.

This command is not supported for IPv6.

match routing source traffic-index

This command matches the traffic-index field based on the source autonomous system for this flow. The traffic-index field is a value propagated through BGP.

This command is not supported for IPv6.

match routing forwarding-status

This command matches a field to indicate if the packets were successfully forwarded. The field is in two parts and may be up to 4 bytes in length. For the releases specified in the Command History table, only the status field is used:

```
+-+-+-+-+-+-+-+-+
  | S | Reason    |
  | t | codes     |
  | a | or        |
  | t | flags     |
  | u |           |
  | s |           |
  +-+-+-+-+-+-+-+-+
   0 1 2 3 4 5 6 7
Status:
00b=Unknown, 01b = Forwarded, 10b = Dropped, 11b = Consumed
```

match routing vrf input

This command matches the VRF ID from incoming packets on a router. In the case where VRFs are associated with an interface via methods such as VRF Selection Using Policy Based Routing/Source IP Address, a VRF ID of 0 will be recorded. If a packet arrives on an interface that does not belong to a VRF, a VRF ID of 0 is recorded.

The **match routing vrf input** command must be configured to capture data if the interface is part of a VRF.

- If the command is not configured and match and collect fields other than MAC address and IP physical interface are added, an error message asking the user to configure **match routing vrf input** command is displayed.

- If the command is not configured and the MAC address and IP physical interface fields are added, there is no error message and these fields are not updated in the exported data.

match routing vrf output

This command matches the VRF ID from outgoing packets on a router.

Examples

The following example configures the source autonomous system as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match routing source as
```

The following example configures the destination autonomous system as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match routing destination as
```

The following example configures the BGP source traffic index as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match routing source traffic-index
```

The following example configures the forwarding status as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match routing forwarding-status
```

The following example configures the VRF ID for incoming packets as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match routing vrf input
```

The following example configures the VRF ID for outgoing packets as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match routing vrf output
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the VRF ID for incoming packets as a key field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match routing vrf input
```

Related Commands

Command	Description
flow record	Creates a flow record and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record and enters Performance Monitor flow record configuration mode.

match routing is-multicast

To configure the use of the is-multicast field (indicating that the IPv4 traffic is multicast traffic) as a key field for a flow record, use the **match routing is-multicast** command in flow record configuration mode. To disable the use of the is-multicast field as a key field for a flow record, use the **no** form of this command.

match routing is-multicast
no match routing is-multicast

Syntax Description   This command has no arguments or keywords

Command Default   The is-multicast field is not configured as a key field.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(22)T	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines   This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

Examples   The following example configures the is-multicast field as a key field for a flow record:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match routing is-multicast
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the is-multicast field as a key field for a Performance Monitor flow record:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match routing multicast replication-factor
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match routing multicast replication-factor

To configure the multicast replication factor value for IPv4 traffic as a key field for a flow record, use the **match multicast replication-factor**command in flow record configuration mode. To disable the use of the multicast replication factor value as a key field for a flow record, use the **no** form of this command.

match routing multicast replication-factor
no match routing multicast replication-factor

Syntax Description   This command has no arguments or keywords.

Command Default   The multicast replication factor value is not configured as a key field.

Command Modes

Flow record configuration(config-flow-record)

Command History

Release	Modification
12.4(22)T	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines   This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

When the replication-factor field is used in a flow record, it will only have a non-zero value in the cache for ingress multicast traffic that is forwarded by the router. If the flow record is used with a flow monitor in output (egress) mode or to monitor unicast traffic or both, the cache data for the replication factor field is set to 0.

Note   This command is not supported on ASR and ISR platforms.

Examples   The following example configures the multicast replication factor value as a key field for a flow record:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match routing multicast replication-factor
```

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

The following example configures the multicast replication factor value as a key field:

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match routing multicast replication-factor
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match transport

To configure one or more of the transport fields as a key field for a flow record, use the **match transport** command in Flexible NetFlow 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** | **igmp type** | **source-port**}
no match transport {**destination-port** | **igmp type** | **source-port**}

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
match transport {**destination-port** | **source-port**}
no match transport {**destination-port** | **source-port**}

Syntax Description		
destination-port	Configures the transport destination port as a key field.
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

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

Command History	Release	Modification
	12.4(9)T	This command was introduced.
	12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
	12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
	12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
	12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
	12.2(50)SY	This command was modified. The **igmp type** keyword combination was removed.
	15.2(2)T	This command was modified. Support for the Cisco Performance Monitor was added.
	Cisco IOS XE Release 3.5S	This command was modified. Support for the Cisco Performance Monitor was added.
	Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples

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

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

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

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

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

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match transport source-port
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match 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 Flexible NetFlow 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

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

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was modified. Support for the Cisco Performance Monitor was added.
Cisco IOS XE Release 3.5S	This command was modified. Support for the Cisco Performance Monitor was added.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples

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

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

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

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

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

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match transport icmp ipv4 type
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match transport icmp ipv6

To configure the internet control message protocol ICMP IPv6 type field and the code field as key fields for a flow record, use the **match transport icmp ipv6** command in Flexible NetFlow 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 ICMP code as a key field.
type	Configures the 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

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

Command History

Release	Modification
12.4(20)T	This command was introduced.
12.2(33)SRE	This command was modified. Support for this command was implemented on for the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was modified. Support for the Cisco Performance Monitor was added.
Cisco IOS XE Release 3.5S	This command was modified. Support for the Cisco Performance Monitor was added.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

A Flow Record requires at least one key field before it can be used in a Flow Monitor. The Key fields differentiate Flows, with each flow having a unique set of values for the key fields. The key fields are defined using the **match** command.

Examples

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

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

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

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

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

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match transport icmp ipv6 type
```

Related Commands	Command	Description
	flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
	flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match transport tcp

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

match transport tcp {**acknowledgement-number** | **bytes out-of-order** | **destination-port** | **flags** {[**ack**] | [**cwr**] | [**ece**] | [**fin**] | [**psh**] | [**rst**] | [**syn**] | [**urg**]} | **header-length** | **maximum-segment-size** | **packets out-of-order** | **sequence-number** | **source-port** | **urgent-pointer** | **window-size** | **window-size-average** | **window-size-maximum** | **window-size-minimum**}
no match transport tcp {**acknowledgement-number** | **bytes out-of-order** | **destination-port** | **flags** {[**ack**] | [**cwr**] | [**ece**] | [**fin**] | [**psh**] | [**rst**] | [**syn**] | [**urg**]} | **header-length** | **maximum-segment-size** | **packets out-of-order** | **sequence-number** | **source-port** | **urgent-pointer** | **window-size** | **window-size-average** | **window-size-maximum** | **window-size-minimum**}

Syntax Description

acknowledgement -number	Configures the TCP acknowledgement number as a key field.
bytes out-of-order	Configures the number of out-of-order bytes as a key field.
destination-port	Configures the TCP destination port as a key field.
flags	Configures one or more of the TCP flags as a key field. If you configure the **flags** keyword you must also configure at least one of the optional keywords for the **flags** keyword.
ack	(Optional) Configures the TCP acknowledgement flag as a key field.
cwr	(Optional) Configures the TCP congestion window reduced flag as a key field.
ece	(Optional) Configures the TCP Explicit Notification Congestion echo (ECE) flag as a key field.
fin	(Optional) Configures the TCP finish flag as a key field.
psh	(Optional) Configures the TCP push flag as a key field.
rst	(Optional) Configures the TCP reset flag as a key field.
syn	(Optional) Configures the TCP synchronize flag as a key field.
urg	(Optional) Configures the TCP urgent flag as a key field.
header-length	Configures the TCP header length (in 32-bit words) as a key field.
maximum-segment-size	Configures the maximum segment size as a key field.
packets out-of-order	Configures the number of out-of-order packets as a key field.
sequence-number	Configures the TCP sequence number as a key field.
source-port	Configures the TCP source port as a key field.

urgent-pointer	Configures the TCP urgent pointer as a key field.
window-size	Configures the TCP window size as a key field.
window-size-average	Configures the average window size as a key field.
window-size-maximum	Configures the maximum window size as a key field.
window-size-minimum	Configures the minimum window size as a key field.

Command Default The use of one or more of the TCP fields as a key field for a user-defined flow record is not enabled by default.

Command Modes

Flow record configuration (config-flow-record)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	Support for this command was added for Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.
Cisco IOS XE Release 3.6S	This command was modified. The **bytes out-of-order**, **packets out-of-order**, **maximum-segment-size**, **window-size-average**, **window-size-maximum**, and **window-size-minimum** keywords were added into Cisco IOS XE Release 3.6S for Cisco Performance Monitor.

Usage Guidelines This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples

The following example configures the TCP acknowledgement flag as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match transport tcp flags ack
```

The following example configures the TCP finish flag as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match transport tcp flags fin
```

The following example configures the TCP reset flag as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match transport tcp flags rst
```

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

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

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

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

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

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

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match transport tcp source-port
```

Related Commands

Command	Description
flow record	Creates a flow record, and enters Flexible NetFlow flow record configuration mode.
flow record type performance-monitor	Creates a flow record, and enters Performance Monitor flow record configuration mode.

match transport udp

To configure one or more of the user datagram protocol UDP fields as a key field for a Flexible NetFlow flow record, use the **match transport udp** command in Flexible NetFlow flow record configuration mode. To disable the use of a UDP field as a key field for a Flexible NetFlow flow record, use the **no** form of this command.

match transport udp {**destination-port** | **message-length** | **source-port**}
no match transport udp {**destination-port** | **message-length** | **source-port**}

Syntax Description

destination-port	Configures the UDP destination port as a key field.
message-length	Configures the UDP message length as a key field.
source-port	Configures the UDP source port as a key field.

Command Default

The UDP fields are not configured as a key field.

Command Modes

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

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	Support for this command was added for Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T for Cisco Performance Monitor.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S for Cisco Performance Monitor.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor. These products use different commands to enter the configuration mode in which you issue this command, however the mode prompt is the same for both products. For Performance Monitor, you must first enter the **flow record type performance-monitor** command before you can use this command.

Because the mode prompt is the same for both products, here we refer to the command mode for both products as flow record configuration mode. However, for Flexible NetFlow, the mode is also known as Flexible NetFlow flow record configuration mode; and for Performance Monitor, the mode is also known as Performance Monitor flow record configuration mode.

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

Examples

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

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

The following example configures the UDP message length as a key field:

```
Router(config)# flow record FLOW-RECORD-1
Router(config-flow-record)# match transport udp message-length
```

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

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

Cisco Performance Monitor in Cisco IOS Release 15.2(2)T and XE 3.5S

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

```
Router(config)# flow record type performance-monitor RECORD-1
Router(config-flow-record)# match transport udp source-port
```

Related Commands

Command	Description
flow record	Creates a flow record.

mode (Flexible NetFlow)

To specify the type of sampling and the packet interval for a Flexible NetFlow sampler, use the **mode** command in Flexible NetFlow sampler configuration mode. To unconfigure the type of sampling and the packet interval for a Flexible NetFlow sampler, use the **no** form of this command.

mode {**deterministic** | **random**} **1** **out-of** *window-size*
no mode

Syntax Description

deterministic	Enables deterministic mode sampling for the sampler.
random	Enables random mode sampling for the sampler.
1 out-of *window-size*	Specifies the window size from which to select packets. Range: 2 to 32768.

Command Default

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

Command Modes

Flexible NetFlow sampler configuration (config-sampler)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines

Deterministic Mode

In deterministic mode, packets are chosen periodically based on the configured interval. This mode has less overhead than random mode and can be useful when the router samples traffic that is random in nature.

Random Mode

In random mode, packets are chosen in a manner that should eliminate any bias from traffic patterns and counter any attempt by users to avoid monitoring.

Examples

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

```
Router(config)# sampler SAMPLER-1
Router(config-sampler)# mode deterministic 1 out-of 1000
```

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

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

Related Commands

Command	Description
clear sampler	Clears the sampler statistics.
debug sampler	Enables debugging output for samplers.
show sampler	Displays sampler status and statistics.

option (Flexible NetFlow)

To configure optional data parameters for a flow exporter for Flexible NetFlow or the Cisco Performance Monitor, use the **option** command in Flexible NetFlow flow exporter configuration mode. To remove optional data parameters for a flow exporter, use the **no** form of this command.

option {**application-attributes** | **application-table** | **c3pl-class-table** | **c3pl-policy-table** | **class-qos-table** | **exporter-stats** | **inspect-class-table** | **inspect-ext-event-table** | **inspect-protocol-table** | **inspect-zonepair-table** | **interface-table** | **metadata-version-table** | **policy-qos-table** | **sampler-table** | **sub-application-table** | **vrf-table**} [**timeout** *seconds*]
no **option** {**application-attributes** | **application-table** | **c3pl-class-table** | **c3pl-policy-table** | **class-qos-table** | **exporter-stats** | **inspect-class-table** | **inspect-ext-event-table** | **inspect-protocol-table** | **inspect-zonepair-table** | **interface-table** | **metadata-version-table** | **policy-qos-table** | **sampler-table** | **sub-application-table** | **vrf-table**}

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
option {**exporter-stats** | **interface-table** | **sampler-table** | **vrf-table**} [**timeout** *seconds*]
no **option** {**exporter-stats** | **interface-table** | **sampler-table** | **vrf-table**}

Cisco IOS XE Release 3.2SE
option {**exporter-stats** | **interface-table** | **sampler-table**} [**timeout** *seconds*]
option {**exporter-stats** | **interface-table** | **sampler-table**} [**timeout** *seconds*]

Syntax Description		
	application-attributes	Configures the application attributes option for flow exporters.
	application-table	Configures the application table option for flow exporters.
	c3pl-class-table	Configures the Cisco Common Classification Policy Language (C3PL) class table.
	c3pl-policy-table	Configures the C3PL policy table.
	class-qos-table	Configures the quality of service (QoS) class table option for flow exporters.
	exporter-stats	Configures the exporter statistics option for flow exporters.
	inspect-class-table	Configures the policy-firewall class table option for flow exporters.
	inspect-ext-event-table	Configures the policy-firewall extended events table for flow exporters.
	inspect-protocol-table	Configures the policy-firewall protocol table for flow exporters.
	inspect-zonepair-table	Configures the policy-firewall zone pair table for flow exporters.
	interface-table	Configures the interface table option for flow exporters.
	metadata-version-table	Configures the metadata version table for flow exporters.
	policy-qos-table	Configures the QoS policy table option for flow exporters.
	sampler-table	Configures the export sampler information option for flow exporters.

sub-application-table	Configures the subapplication table option for flow exporters.
vrf-table	Configures the virtual routing and forwarding (VRF) ID-to-name table option for flow exporters.
timeout *seconds*	(Optional) Configures the option resend time in seconds for flow exporters. The range is from 1 to 86400. The default is 600.

Command Default   The optional data parameters are not configured.

Command Modes   Flow exporter configuration (config-flow-exporter)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
15.0(1)M	This command was modified. The **application-table** and **vrf-table** keywords were added.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
Cisco IOS XE Release 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
15.1(3)T	This command was modified. Support for the Cisco Performance Monitor was added.
12.2(58)SE	This command was modified. Support for the Cisco Performance Monitor was added.
12.2(50)SY	This command was modified. The **application-table** keyword was removed.
Cisco IOS XE Release 3.5S	This command was modified. The **application-attributes** keyword was added.
15.2(1)S2	This command was modified. The **sub-application-table** keyword was added.
15.2(4)M2	This command was modified. The **class-qos-table** and **policy-qos-table** keywords were added.

Release	Modification
Cisco IOS XE Release 3.2SE	This command was modified. The **application-attributes**, **application-table** , and **vrf-table** keywords were removed.
15.4(2)T	This command was modified. The **c3pl-class-table**, **c3pl-policy-table**, **inspect-class-table**, **inspect-ext-event-table**, **inspect-protocol-table**, **inspect-zonepair-table**, and **metadata-version-table** keywords were added.

Usage Guidelines

The **option** command can be used with both Flexible NetFlow and the Cisco Performance Monitor.

Use the **timeout** keyword to alter the frequency at which reports are sent.

The **option   application-attributes** command causes the periodic sending of network-based application recognition (NBAR) application attributes to an external collector.

The following application attributes are sent to the collector per protocol:

- Application-Group—Group applications that belong to the same networking application.

- Category—Provides first-level categorization for each application.

- Encrypted—Specifies whether the application is an encrypted networking protocol.

- P2P-Technology—Specifies whether the application is based on peer-to-peer technology.

- Sub-Category—Provides second-level categorization for each application.

- Tunnel-Technology—Specifies whether the application tunnels the traffic of other protocols.

The **option   application-table** command enables the periodic sending of an options table that allows the collector to map NBAR application IDs provided in the flow records to application names.

The **option   class-qos-table** command enables the periodic sending of an options table that allows the collector to map QoS class IDs to class names in the flow records.

The **option   exporter-stats** command enables the periodic sending of exporter statistics, including the number of records, bytes, and packets. This command allows the collector to estimate packet loss for the export records it receives.

The **option   inspect-class-table** command enables the export of option templates that map inspect class-ID-to-class-name.

The **option   inspect-ext-event-table** command enables the export option templates that map the firewall Event-ID-to-Event-name.

The **option   inspect-protocol-table** command enables the export of option templates that map the firewall protocol-ID-to-protocol-name.

The **option   inspect-zonepair-table** command enables the export of option templates that map Zone-Pair-ID-to-Zone-Pair-Name.

The **option   interface-table** enables the periodic sending of an options table that allows the collector to map the interface Simple Network Management Protocol (SNMP) indexes provided in flow records to interface names.

The **option policy-qos-table** command enables the periodic sending of an options table that allows the collector to map QoS policy IDs to policy names in the flow records.

The **option sampler-table** command enables the periodic sending of an options table that provides complete information about 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 **option sub-application-table** command enables the periodic sending of an options table that allows the collector to map NBAR subapplication tags, subapplication names, and subapplication descriptions provided in the flow records to application IDs.

The **option vrf-table** command enables the periodic sending of an options table that allows the collector to map the VRF IDs provided in the flow records to VRF names.

Examples

The following example shows how to enable the periodic sending of NBAR application attributes to the collector:

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

The following example shows how to enable the periodic sending of an options table that allows the collector to map QoS class IDs provided in flow records to class names:

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

The following example shows how to enable the periodic sending of an options table that allows the collector to map QoS policy IDs provided in flow records to policy names:

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

The following example shows how to enable the periodic sending of 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 that allows the collector to map the interface SNMP indexes provided in flow records to interface names:

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

The following example shows how to enable the periodic sending of an options table that allows the collector to map NBAR application IDs provided in flow records to application names:

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

The following example shows how to enable the periodic sending of an options table that details the configuration of each sampler and allows the collector to map the sampler ID provided in any flow record to a configuration that the collector can use to scale up the flow statistics:

```
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 an options table that allows the collector to map the NBAR subapplication tags, subapplication names, and subapplication descriptions provided in flow records to application IDs:

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

The following example shows how to enable the periodic sending of an options table that allows the collector to map the virtual routing and forwarding (VRF) IDs provided in flow records to VRF names:

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

Related Commands

Command	Description
flow exporter	Creates a flow exporter.

output-features

To enable sending export packets for Flexible NetFlow or Performance Monitor using quality of service (QoS) or encryption, use the **output-features** command in flow exporter configuration mode. To disable sending export packets using QoS or encryption, use the **no** form of this command.

output-features
no output-features

Syntax Description	This command has no arguments or keywords.
Command Default	If QoS or encryption is configured on the router, neither QoS or encryption is run on Flexible NetFlow or Performance Monitor export packets.
Command Modes	flow exporter configuration (config-flow-exporter)

Command History

Release	Modification
12.4(20)T	This command was introduced.
15.1(3)T	This command was integrated into Cisco IOS Release 15.1(3)T for Cisco Performance Monitor.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE for Cisco Performance Monitor.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor.

If the router has the output feature quality of service (QoS) or encryption configured, the **output-features** command causes the output features to be run on Flexible NetFlow or Performance Monitor export packets.

Examples

The following example configures the use of QoS or encryption on Flexible NetFlow or Performance Monitor export packets:

```
Router(config)# flow exporter FLOW-EXPORTER-1
Router(config-flow-exporter)# output-features
```

Related Commands

Command	Description
flow exporter	Creates a flow exporter.

record

To configure a flow record for a Flexible NetFlow flow monitor, use the **record** command in Flexible NetFlow 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* | **netflow-original** | **netflow** {**ipv4** | **ipv6**} *record* [**peer**]}
no   record

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
record {*record-name* | **platform-original** {**ipv4** | **ipv6**} *record*}
no   record

Cisco IOS XE Release 3.2SE
record *record-name*
no   record

Syntax Description

record-name	Name of a user-defined flow record that was previously configured.
netflow-original	Configures the flow monitor to use the Flexible NetFlow implementation of original NetFlow with origin autonomous systems.
netflow ipv4	Configures the flow monitor to use one of the predefined IPv4 records.
netflow ipv6	Configures the flow monitor to use one of the predefined IPv6 records. This keyword is not supported on the Cisco ASR 1000 Series Aggregation Services router.
record	Name of the predefined record. See the table below for a listing of the available records and their definitions.
peer	(Optional) Configures the flow monitor to use one of the predefined records with peer autonomous systems. The **peer** keyword is not supported for every type of Flexible NetFlow predefined record. See the table below.
platform-original ipv4	Configures the flow monitor to use one of the predefined IPv4 records.
platform-original ipv4	Configures the flow monitor to use one of the predefined IPv6 records.

Command Default   A flow record is not configured.

Command Modes

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

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.

Release	Modification
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.4(20)T	This command was modified. The **ipv6** keyword was added.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
Cisco IOS XE 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
12.2(50)SY	This command was modified. The **netflow-original** , **netflow ipv4** , and **netflow ipv6** keywords were removed. The **platform-originalipv4**a nd **platform-originalipv4** keywords were added.
Cisco IOS XE Release 3.2SE	This command was modified. The **netflow-original** , **netflow ipv4** , and **netflow ipv6** keywords were removed.

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 flowmonitor 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.

The table below describes the keywords and descriptions for the *record* argument.

Table 2: Keywords and Descriptions for the record Argument

Keyword	Description	IPv4 Support	IPv6 Support
as	Autonomous system record.	Yes	Yes
as-tos	Autonomous system and ToS record.	Yes	—
bgp-nexthop-tos	BGP next-hop and ToS record.	Yes	—
bgp-nexthop	BGP next-hop record.	—	Yes
destination	Original 12.2(50)SY platform IPv4/IPv6 destination record.	Yes	Yes
destination-prefix	Destination Prefix record. **Note** For IPv6, a minimum prefix mask length of 0 bits is assumed.	Yes	Yes

Keyword	Description	IPv4 Support	IPv6 Support
destination-prefix-tos	Destination prefix and ToS record.	Yes	—
destination-source	Original 12.2(50)SY platform IPv4/IPv6 destination-source record.	Yes	Yes
full	Original 12.2(50)SY platform IPv4/IPv6 full record.	Yes	Yes
interface-destination	Original 12.2(50)SY platform IPv4/IPv6 interface-destination record.	Yes	Yes
interface-destination-source	Original 12.2(50)SY platform IPv4/IPv6 interface-destination-source record.	Yes	Yes
interface-full	Original 12.2(50)SY platform IPv4/IPv6 interface-full record.	Yes	Yes
interface-source	Original 12.2(50)SY platform IPv4/IPv6 interface-source only record.	Yes	Yes
original-input	Traditional IPv4 input NetFlow.	Yes	Yes
original-output	Traditional IPv4 output NetFlow.	Yes	Yes
prefix	Source and destination prefixes record. **Note** For IPv6, a minimum prefix mask length of 0 bits is assumed.	Yes	Yes
prefix-port	Prefix port record. **Note** The **peer** keyword is not available for this record.	Yes	--
prefix-tos	Prefix ToS record.	Yes	--
protocol-port	Protocol ports record. **Note** The **peer** keyword is not available for this record.	Yes	Yes
protocol-port-tos	Protocol port and ToS record. **Note** The **peer** keyword is not available for this record.	Yes	—
source-prefix	Source autonomous system and prefix record. **Note** For IPv6, a minimum prefix mask length of 0 bits is assumed.	Yes	Yes
source-prefix-tos	Source Prefix and ToS record.	Yes	—

Examples

The following example configures the flow monitor to use the NetFlow original record:

```
Router(config)# flow monitor FLOW-MONITOR-1
Router(config-flow-monitor)# record netflow-original
```

The following example configures the flow monitor to use a user-defined record named collect-ipv4-data:

```
Router(config)# flow monitor FLOW-MONITOR-1
Router(config-flow-monitor)# record collect-ipv4-data
```

The following example configures the flow monitor to use the Flexible NetFlow IPv4 destination prefix record:

```
Router(config)# flow monitor FLOW-MONITOR-1
Router(config-flow-monitor)# record netflow ipv4 destination-prefix
```

The following example configures the flow monitor to use a the Flexible NetFlow IPv6 destination prefix record:

```
Router(config)# flow monitor FLOW-MONITOR-1
Router(config-flow-monitor)# record netflow ipv6 destination-prefix
```

Related Commands

Command	Description
flow monitor	Creates a flow monitor.

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 (config)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
15.1(2)S	This command was modified. A hash collision between the name supplied and any existing name is now possible. If this happens, you can retry, supplying another name.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

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 to 32,768 packets. For example, a rate of 1 out of 2 results in analysis of 50 percent of the packets sampled. 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.

In Cisco IOS Release 15.1(2)S and later releases, a hash collision between the name supplied and any existing name is possible. If this happens, you can retry, supplying another name.

Examples

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

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

The following example shows the output when there is a hash collision between the name supplied and any existing name:

```
Router(config-sampler)# sampler SAMPLER-1
% sampler: Failed to create a new Sampler (Hash value in use).
Router(config)#
```

Related Commands

Command	Description
clear sampler	Clears the flow sampler statistics.
debug sampler	Enables debugging output for flow samplers.
mode	Configures a packet interval for a flow sampler.
show sampler	Displays flow sampler status and statistics.

show flow exporter

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

show flow exporter [{**broker** {**detail** | **picture**} | **export-ids** {**netflow-v5** | **netflow-v9**} | [**name**] *exporter-name* [{**statistics** | **templates**}] [**option application** {**engines** | **table**}]}]

Cisco IOS XE Release 3.2SE
show flow exporter [{**export-ids netflow-v9** | [**name**] *exporter-name* [{**statistics** | **templates**}]}]

Syntax Description

broker	(Optional) Displays the flow exporter broker.
broker detail	(Optional) Displays detailed information about the flow exporter broker.
broker picture	(Optional) Displays picture of flow exporter broker state.
export-ids netflow-v5	(Optional) Displays the NetFlow Version 5 export fields that can be exported and their IDs.
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 flow exporter statistics.
templates	(Optional) Displays flow exporter template information.
option application engines	(Optional) Displays the application engines option for flow exporters.
option application table	(Optional) Displays the application table option for flow exporters.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.

Release	Modification
Cisco IOS XE 3.1S	This command was modified. The **option** and **application** keywords were added.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
15.2.(2)T	This command was modified. The ability to display IPv6 addresses was added.
Cisco IOS XE 3.5S	This command was modified. The ability to display IPv6 addresses was added.
Cisco IOS XE Release 3.2SE	This command was modified. The **export-ids netflow-v5** , **option application engines** , and **option application table** keywords were removed.

Examples

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

```
Router# show flow exporter

Flow Exporter FLOW-MONITOR-1:
  Description:            Exports to the datacenter
  Export protocol:        NetFlow Version 9
  Transport Configuration:
    Destination IP address: 172.16.10.2
    Source IP address:    172.16.6.2
    Source Interface:     Ethernet0/0
    Transport Protocol:   UDP
    Destination Port:     650
    Source Port:          55864
    DSCP:                 0x3F
    TTL:                  15
    Output Features:      Used

Flow Exporter FLOW-MONITOR-2:
  Description:            Exports to the datacenter
  Export protocol:        NetFlow Version 9
  Transport Configuration:
    Destination IP address: 2222::2/64
    Source IP address:    1111::1/64
    Transport Protocol:   UDP
    Destination Port:     4739
    Source Port:          49936
    DSCP:                 0x0
    TTL:                  255
    Output Features:      Not Used

Options Configuration:
    exporter-stats (timeout 120 seconds)
    interface-table (timeout 120 seconds)
```

sampler-table (timeout 120 seconds)

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

Table 3: 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.

The following example displays the NetFlow Version 9 export IDs for all of the flow exporters configured on a router. This output will vary according to the flow record configured:

```
Router#show flow exporter export-ids netflow-v9
Export IDs used by fields in NetFlow-v9 export format:
  misc unsupported                      : 37027
  datalink source-vlan-id               :    58
  datalink destination-vlan-id          :    59
  datalink encap-size                   :   242
  datalink ethertype                    :   256
  datalink length header                :   240
  datalink length payload               :   241
  datalink section header               :   315
  datalink vlan input                   :    58
  datalink dot1q vlan input             :   243
  datalink dot1q vlan output            :   254
  datalink dot1q ce-vlan                :   245
  datalink dot1q priority               :   244
  datalink dot1q ce-priority            :   246
  datalink l2vpn metro vcid             :   247
  datalink l2vpn metro vctype           :   248
  datalink mac source-address           :    56
  datalink mac destination-address      :    80
  datalink mac source address input     :    56
  datalink mac source address output    :    81
  datalink mac destination address input :   80
  datalink mac destination address output :  57
  ip version                            :    60
  ip tos                                :     5
  ip dscp                               :   195
  ip precedence                         :   196
  ip protocol                           :     4
  ip ttl                                :   192
  ip ttl minimum                        :    52
  ip ttl maximum                        :    53
```

```
                 ip length header                       :    189
                 ip length payload                      :    204
                 ip length total                        :    224
                 ip length total minimum                :     25
                 ip length total maximum                :     26
                 ip fragmentation flags                 :    197
                 ip fragmentation offset                :     88
                 ip fragmentation id                    :     54
                 ip section header                      :    313
                 ip section payload                     :    314
                 routing source as                      :     16
                 routing destination as                 :     17
                 routing source as peer                 :    129
                 routing destination as peer            :    128
                 routing source as 4-octet              :     16
                 routing destination as 4-octet         :     17
                 routing source as peer 4-octet         :    129
                 routing destination as peer 4-octet    :    128
                 routing source traffic-index           :     92
                 routing destination traffic-index      :     93
                 routing forwarding-status              :     89
                 routing is-multicast                   :    206
                 routing multicast replication-factor   :     99
                 routing vrf input                      :    234
                 routing vrf name                       :    236
                 routing next-hop address ipv4          :     15
                 routing next-hop address ipv4 bgp      :     18
                 routing next-hop address ipv6          :     62
                 routing next-hop address ipv6 bgp      :     63
                 ipv4 header-length                     :    207
                 ipv4 total-length                      :    190
                 ipv4 source address                    :      8
                 ipv4 source prefix                     :     44
                 ipv4 source mask                       :      9
                 ipv4 destination address               :     12
                 ipv4 destination prefix                :     45
                 ipv4 destination mask                  :     13
                 ipv4 option map                        :    208
                 ipv6 flow-label                        :     31
                 ipv6 next-header                       :    193
                 ipv6 payload-length                    :    191
                 ipv6 extension map                     :     64
                 ipv6 source address                    :     27
                 ipv6 source prefix                     :    170
                 ipv6 source mask                       :     29
                 ipv6 destination address               :     28
                 ipv6 destination prefix                :    169
                 ipv6 destination mask                  :     30
                 transport source-port                  :      7
                 transport destination-port             :     11
                 transport packets expected counter     :  37014
                 transport packets expected counter long : 37014
                 transport packets expected counter permane : 37015
                 transport packets lost counter         :  37019
                 transport packets lost counter long    :  37019
                 transport packets lost counter permanent :  37020
                 transport packets lost rate            :  37021
                 transport round-trip-time              :  37016
                 transport event packet-loss counter    :  37017
                 transport event packet-loss counter long :  37017
                 transport event packet-loss counter perman : 37018
                 transport rtp jitter mean              :  37023
                 transport rtp jitter minimum           :  37024
                 transport rtp jitter maximum           :  37025
```

```
        transport rtp ssrc                        : 37022
        transport icmp ipv4 type                  :   176
        transport icmp ipv4 code                  :   177
        transport icmp ipv6 type                  :   178
        transport icmp ipv6 code                  :   179
        transport igmp type                       :    33
        transport tcp source-port                 :   182
        transport tcp destination-port            :   183
        transport tcp sequence-number             :   184
        transport tcp acknowledgement-number      :   185
        transport tcp header-length               :   188
        transport tcp window-size                 :   186
        transport tcp urgent-pointer              :   187
        transport tcp flags                       :     6
        transport tcp option map                  :   209
        transport udp source-port                 :   180
        transport udp destination-port            :   181
        transport udp message-length              :   205
        interface input snmp                      :    10
        interface output snmp                     :    14
        interface input snmp short                :    10
        interface output snmp short               :    14
        interface input physical snmp             :   252
        interface output physical snmp            :   253
        interface name short                      :    82
        interface name long                       :    83
        flow direction                            :    61
        flow exporter                             :   144
        flow sampler                              :    48
        flow sampler algorithm export             :    49
        flow sampler interval                     :    50
        flow sampler name                         :    84
        flow class                                :    51
        flow class export                         :    95
        flow class name                           :    96
        flow class description                    :    94
        stats error absolute                      :   320
        flow cts source group-tag                 : 34000
        flow cts destination group-tag            : 34001
        counter flows                             :     3
        counter bytes                             :     1
        counter bytes long                        :     1
        counter packets                           :     2
        counter packets long                      :     2
        counter bytes replicated                  :    20
        counter bytes replicated long             :    20
        counter packets replicated                :    19
        counter packets replicated long           :    19
        counter bytes squared long                :   198
        counter bytes permanent                   :    85
        counter packets permanent                 :    86
        counter bytes replicated permanent        :   175
        counter packets replicated permanent      :   174
        counter bytes squared permanent           :   199
        counter bytes exported                    :    40
        counter packets exported                  :    41
        counter bytes rate                        : 37003
        counter packets rate                      : 37002
        counter flows exported                    :    42
        counter packets dropped                   : 37000
        counter packets dropped long              : 37000
        counter packets dropped permanent         : 37001
        timestamp sys-uptime first                :    22
        timestamp sys-uptime last                 :    21
```

```
        timestamp interval                       : 37013
        timestamp absolute first                 :   152
        timestamp absolute last                  :   153
        application id                           :    95
        application name                         :    96
        application description                  :    94
        application media bytes counter          : 37004
        application media bytes counter long     : 37004
        application media bytes counter permanent : 37005
        application media bytes rate             : 37006
        application media packets counter        : 37007
        application media packets counter long   : 37007
        application media packets counter permanen : 37008
        application media packets rate           : 37009
        application media packets rate variation : 37010
        application media event                  : 37011
        monitor event                            : 37012
        waas dre input                           : 36000
        waas dre output                          : 36001
        waas lz input                            : 36002
        waas lz output                           : 36003
        waas original bytes                      : 36004
        waas optimised bytes                     : 36005
        waas application                         : 36006
        waas class                               : 36007
        waas connection mode                     : 36008
        art response time sum                    : 42071
        art response time minimum                : 42073
        art response time maximum                : 42072
        art server response time sum             : 42074
        art server response time minimum         : 42076
        art server response time maximum         : 42075
        art network time sum                     : 42081
        art network time minimum                 : 42083
        art network time maximum                 : 42082
        art client network time sum              : 42084
        art client network time minimum          : 42086
        art client network time maximum          : 42085
        art server network time sum              : 42087
        art server network time minimum          : 42089
        art server network time maximum          : 42088
        art total response time sum              : 42077
        art total response time minimum          : 42079
        art total response time maximum          : 42078
        art total transaction time sum           : 42041
        art total transaction time minimum       : 42043
        art total transaction time maximum       : 42042
        art count transactions                   : 42040
        art server packets                       :   299
        art server bytes                         :   232
        art count retransmissions                : 42036
        art client packets                       :   298
        art client bytes                         :   231
        art count new connections                : 42050
        art count responses                      : 42060
        art count late responses                 : 42068
        waas bytes input                         : 36009
        waas bytes output                        : 36010
        waas optimization segment                : 42020
        art count responses histogram bucket1    : 42061
        art count responses histogram bucket2    : 42062
        art count responses histogram bucket3    : 42063
        art count responses histogram bucket4    : 42064
        art count responses histogram bucket5    : 42065
```

```
              art count responses histogram bucket6   : 42066
              art count responses histogram bucket7   : 42067
              counter server bytes                     :    23
              counter server packets                   :    24
              datalink event                           : 43000
              datalink event extended                  : 43002
              flow end-reason                          :   136
              connection initiator                     :   239
              connection new-connections               :   278
              connection sum-duration                  :   279
              connection transaction-id                :   280
              counter bytes rate per-flow              : 37028
              counter bytes rate per-flow min          : 37029
              counter bytes rate per-flow max          : 37030
              counter packets rate per-flow            : 37031
              counter packets rate per-flow min        : 37032
              counter packets rate per-flow max        : 37033
              application media bytes rate per-flow min : 37035
              application media bytes rate per-flow max : 37036
              application media packets rate variation m : 37038
              application media packets rate variation m : 37039
              transport rtp flow count                 : 37040
              transport event packet-loss counter min  : 37044
              transport event packet-loss counter max  : 37045
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                egress bw long                                : 39019
                max egress bw                                 : 39020
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           connection delay network to-server sum    :  42087
           connection delay network to-server min    :  42089
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           connection transaction duration min       :  42043
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```

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                    connection client counter bytes long    :   231
                    connection client counter packets long  :   298
                    connection client ipv4 address          : 45004
                    connection client transport port        : 45008
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                    template enterprise number              :   346
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                    application video frame STR counter bytes  : 37510
                    application video frame LTR counter frames : 37511
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                    application video frame LTR counter bytes  : 37513
                    application video frame super-P counter fr : 37514
                    application video frame super-P counter pa : 37515
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                    application video frame NR counter frames  : 37517
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                    application video frame super-P slice-quan : 37523
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                    application video eMOS compression bitstre : 37525
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                    application video scene-complexity        : 37535
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                    transport rtp sequence-number            : 37537
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             services pfr mc-id                      : 39030
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             interface output type                   :   369
             interface input fex-node-id             : 41101
             interface output fex-node-id            : 41102
             flow username                           :   371
             interface power                         : 41103
             monitor device-type                     : 41104
             transport tcp maximum-segment-size      : 37086
             wireless ssid                           :   147
             wireless ap mac address                 :   367
             wireless client mac address             :   365
             wireless client ipv4 address            :   366
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             pbhk mapped transport port              : 44006
             pbhk event                              : 44007
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             transport jitter mean                   :   385
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             connection client counter bytes retransmit : 42035
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             counter packets long aor                :     2
             timestamp sys-uptime first aor          :    22
             application voice number called         : 37200
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             application voice rx bad-packet         : 37204
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             application voice codec id              : 37206
             application voice play delay current    : 37207
             application voice play delay minimum    : 37208
             application voice play delay maximum    : 37209
             application voice sip call-id           : 37210
             application voice router global-call-id : 37211
             application voice delay round-trip      : 37212
             application voice delay end-point       : 37213
             application voice r-factor 1            : 37214
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             application voice mos conversation      : 37216
             application voice mos listening         : 37217
             application voice concealment-ratio averag : 37218
             application voice jitter configured type : 37219
             application voice jitter configured minimu : 37220
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             application voice rx early-packet count  : 37223
             application voice rx late-packet count   : 37224
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pfr site source id ipv6                 :  37099
pfr site destination id ipv6            :  37100
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network delay sample                    :  37105
pfr counter event error traffic-class miti :  37106
pfr counter event error traffic-class miti :  37107
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pfr site source prefix ipv4             :  37109
pfr site destination prefix ipv4        :  37110
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pfr site source prefix mask ipv4        :  37113
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connection concurrent-connections       :  42018
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connection delay network long-lived client :  42024
connection delay network client-to-server  :  42025
connection delay network to-server num-sam :  42026
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ipv4 destination address nat            :    226
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policy firewall event                   :    233
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policy firewall event timestamp         :    323
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policy firewall event level id          :  33004
policy firewall zone-pair id            :  35007
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policy firewall incomplete count        :  35012
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audio rtp fwd out-of-sequence sum       :  33052
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audio rtp seconds concealed             :  33054
audio rtp seconds concealed severe      :  33055
audio rtp jitter ticks                  :  33056
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audio g107 lossRate                     :  33058
audio g107 codec baseline               :  33059
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```

```
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audio concealment ratio now               : 33062
audio concealment ratio minimum           : 33063
audio concealment ratio maximum           : 33064
audio concealment time                    : 33065
audio speech time                         : 33066
audio packets ok                          : 33067
audio packets cs                          : 33068
audio packets scs                         : 33069
audio packets rtp                         : 33070
audio packets silence                     : 33071
audio duration receive                    : 33072
audio duration receive voice              : 33073
audio duration early packet               : 33074
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audio frame arriving times difference     : 33081
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audio noise level minimum                 : 33085
audio noise level maximum                 : 33086
audio noise level configured              : 33087
audio snr current                         : 33088
audio snr average                         : 33089
audio snr minimum                         : 33090
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IOAM byte count                           : 38006
IOAM cs0 packet counter                   : 38007
IOAM cs0 byte count                       : 38008
IOAM cs1 packet counter                   : 38009
IOAM cs1 byte count                       : 38010
IOAM cs2 packet counter                   : 38011
IOAM cs2 byte count                       : 38012
IOAM cs3 packet counter                   : 38013
IOAM cs3 byte count                       : 38014
IOAM cs4 packet counter                   : 38015
IOAM cs4 byte count                       : 38016
IOAM cs5 packet counter                   : 38017
IOAM cs5 byte count                       : 38018
IOAM cs6 packet counter                   : 38019
IOAM cs6 byte count                       : 38020
IOAM cs7 packet counter                   : 38021
IOAM cs7 byte count                       : 38022
IOAM lost packet counter                  : 38023
IOAM duplicate packet counter             : 38024
IOAM reordered packet counter             : 38025
IOAM highest PPC sequence number          : 38026
```

```
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                iOAM E2E Header                           : 38029
                iOAM Path Map                             : 38030
                iOAM number of nodes                      : 38031
                iOAM node1 id                             : 38032
                iOAM node1 in if id                       : 38033
                iOAM node1 eif id                         : 38034
                iOAM node2 id                             : 38035
                iOAM node2 in if id                       : 38036
                iOAM node2 eif id                         : 38037
                iOAM node3 id                             : 38038
                iOAM node3 in if id                       : 38039
                iOAM node3 eif id                         : 38040
                iOAM node4 id                             : 38041
                iOAM node4 in if id                       : 38042
                iOAM node4 eif id                         : 38043
                iOAM Application metadata                 : 38044
                iOAM sfc-id                               : 38045
                iOAM sfc validated count                  : 38046
                iOAM sfc invalidated count                : 38047
                ipv4 splt                                 : 44941
                ipv4 idp                                  : 44940
                ipv4 bd                                   : 44944
                application set name                      : 44999
                vxlan vnid                                :   351
                vxlan sgt                                 : 33200
                vxlan flags                               : 33201
                application family name                   : 44998
                overlay session id input                  : 45200
                overlay session id output                 : 45201
                routing vrf service                       : 45202
                tloc table overlay session id             : 45203
                tloc local system ip address              : 45204
                tloc local color                          : 45205
                tloc remote system ip address             : 45206
                tloc remote color                         : 45207
                tloc tunnel protocol                      : 45208
                connection id long                        : 45209
                bandwidth used                            : 37300
                bandwidth used percentage                 : 37301
                Layer3 Virtual-Private-Network ID         :   482
                drop cause id                             : 45210
                counter bytes sdwan dropped long          : 45211
                sdwan sla-not-met                         : 45212
                sdwan preferred-color-not-met             : 45213
                sdwan qos-queue-id                        : 45214
                drop cause name                           : 45215
                counter packets sdwan dropped long        : 37000
                counter packets appqoe fec-d-pkts         : 45216
                counter packets appqoe fec-r-pkts         : 45217
                counter packets appqoe pkt-dup-d-pkts-orig : 45218
                counter packets appqoe pkt-dup-d-pkts-dup  : 45219
                counter packets appqoe pkt-dup-r-pkts     : 45220
                counter packets sdwan pkt-cxp-d-pkts      : 45221
                counter bytes appqoe ssl-read             : 45222
                counter bytes appqoe ssl-written          : 45223
                counter bytes appqoe ssl-en-read          : 45224
                counter bytes appqoe ssl-en-written       : 45225
                counter bytes appqoe ssl-de-read          : 45226
                counter bytes appqoe ssl-de-written       : 45227
                vxlan vtep input                          : 33202
                vxlan vtep output                         : 33203
                appqoe ssl service type                   : 45228
```

```
    appqoe ssl traffic type                     : 45229
    appqoe ssl policy action                    : 45230
```

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

```
Router#show flow exporter name sdwan_flow_exporter_1 statistics
Flow Exporter sdwan_flow_exporter_1:
  Packet send statistics (last cleared 1w4d ago):
    Successfully sent:          320167                    (281428348 bytes)
    Reason not given:           21045                     (2435564 bytes)

  Client send statistics:
    Client: Option options interface-table
      Records added:            86676
        - sent:                 86676
      Bytes added:              8667600
        - sent:                 8667600

    Client: Option options tunnel-tloc-table
      Records added:            16605
        - sent:                 16605
      Bytes added:              863460
        - sent:                 863460

    Client: Option options drop-cause-table
      Records added:            7107432
        - sent:                 7107432
      Bytes added:              248760120
        - sent:                 248760120

    Client: Flow Monitor sdwan_flow_monitor
      Records added:            121918
        - sent:                 117907
        - failed to send:       4011
      Bytes added:              9753440
        - sent:                 9432560
        - failed to send:       320880
```

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

Table 4: show flow exporter name exporter-name statistics Field Descriptions

Field	Description
Flow Exporter	The name of the flow exporter that you configured.
Packet send statistics	The packet transmission statistics for this exporter.
Ok	The number of packets that have been sent successfully.
No FIB	No entry in the Forwarding Information Base (FIB) to forward to.
Adjacency failure	No Cisco Express Forwarding (CEF) adjacency available for forwarding.
Enqueued to process level	Packets that were sent to the processor for forwarding.
Enqueueing failed	Packets that could not be queued for transmission.
IPC failed	Packets for which interprocess communication (IPC) failed.
Output failed	Packets that were dropped because the output queue was full.

Field	Description
Fragmentation failed	Packets that were not able to be fragmented.
Encap fixup failed	Packets that were not able to be encapsulated for transmission on the egress interface.
No destination address	No destination address configured for the exporter.
Client send statistics	Statistics for the flow monitors that are using the exporters.
Client	The name of the flow monitor that is using the exporter.
Records added	The number of flow records that have been added for this flow monitor. Netflow records are sent by HSL. Record sending may fail due to the following causes: • No valid destination is configured. Verify the route using **show ip cef** *dest-addr*. • The packets built by HSL are dropped when sending to destination. Check for dropped packets using **show platform hardware qfp active statistics drop**.
Packets sent	The number of packets that have been exported for this flow monitor.
Packets dropped	The number of packets that were dropped for this flow monitor.
No Packet available error	The number of times that no packets were available to transmit the records.

The following example displays the template format for the exporters configured on the router. This output will vary according to the flow record configured:

```
Router# show flow exporter FLOW_EXPORTER-1 templates

Flow Exporter FLOW-MONITOR-1:
  Client: Flow Monitor FLOW-MONITOR-1
  Exporter Format: NetFlow Version 9
  Template ID   : 256
  Record Size   : 53
  Template layout

  _____
  |              Field                | Type1 | Offset2 |  Size3 |
  -----------------------------------------------------------------
  | ipv4 source address               |    8 |     0 |     4 |
  | ipv4 destination address          |   12 |     4 |     4 |
  | interface input snmp              |   10 |     8 |     4 |
  | flow sampler                      |   48 |    12 |     4 |
  | transport source-port             |    7 |    16 |     2 |
  | transport destination-port        |   11 |    18 |     2 |
  | ip tos                            |  194 |    20 |     1 |
  | ip protocol                       |    4 |    21 |     1 |
  | ipv4 source mask                  |    9 |    22 |     1 |
  | ipv4 destination mask             |   13 |    23 |     1 |
  | transport tcp flags               |    6 |    24 |     1 |
  | routing source as                 |   16 |    25 |     2 |
  | routing destination as            |   17 |    27 |     2 |
```

```
| routing next-hop address ipv4           |    15 |    29  |     4  |
| interface output snmp                    |    14 |    33  |     4  |
| counter bytes                            |     1 |    37  |     4  |
| counter packets                          |     2 |    41  |     4  |
| timestamp sys-uptime first               |    22 |    45  |     4  |
| timestamp sys-uptime last                |    21 |    49  |     4  |
 ----------------------------------------------------------------
```

Related Commands

Command	Description
clear flow exporter	Clears the statistics for exporters.
debug flow exporter	Enables debugging output for flow exporters.
flow exporter	Creates a flow exporter.

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
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Examples

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

```
Router# show flow interface ethernet 1/0

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

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

Table 5: show flow interface Field Descriptions

Field	Description
Interface	The interface to which the information applies.
monitor	The name of the flow monitor that is configured on the interface.
direction:	The direction of traffic that is being monitored by the flow monitor. The possible values are: • Input—Traffic is being received by the interface. • Output—Traffic is being transmitted by the interface.
traffic(ip)	Indicates if the flow monitor is in normal mode or sampler mode. The possible values are: • on—The flow monitor is in normal mode. • sampler—The flow monitor is in sampler mode (the name of the sampler will be included in the display).

Related Commands

Command	Description
show flow monitor	Displays flow monitor status and statistics.

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 [[**name**] *monitor-name* [**cache** [**format** {**csv** | **record** | **table**}]] [**statistics**]]

<table>
<tr><td rowspan="10">Syntax Description</td></tr>
<tr><td>name</td><td>(Optional) Specifies the name of a flow monitor.</td></tr>
<tr><td><i>monitor-name</i></td><td>(Optional) Name of a flow monitor that was previously configured.</td></tr>
<tr><td>cache</td><td>(Optional) Displays the contents of the cache for the flow monitor.</td></tr>
<tr><td>format</td><td>(Optional) Specifies the use of one of the format options for formatting the display output.</td></tr>
<tr><td>csv</td><td>(Optional) Displays the flow monitor cache contents in comma separated variables (CSV) format.</td></tr>
<tr><td>record</td><td>(Optional) Displays the flow monitor cache contents in record format.</td></tr>
<tr><td>table</td><td>(Optional) Displays the flow monitor cache contents in table format.</td></tr>
<tr><td>statistics</td><td>(Optional) Displays the statistics for the flow monitor.</td></tr>
</table>

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.4(20)T	This command was modified. Support for displaying IPv6 data in Flexible NetFlow flow monitor caches was added.
15.0(1)M	This command was modified. Support for displaying virtual routing and forwarding (VRF) and Network Based Application Recognition (NBAR) data in Flexible NetFlow flow monitor caches was added.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines   The **cache** keyword uses the table 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:

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

Flow Monitor FLOW-MONITOR-1:
  Description:       Used for basic traffic analysis
  Flow Record:       netflow-original
  Flow Exporter:     EXP-DC-TOPEKA
                     EXP-DC-PHOENIX
  Cache:
    Type:            normal
    Status:          allocated
    Size:            4096 entries / 311316 bytes
    Inactive Timeout: 15 secs
    Active Timeout:   1800 secs
    Update Timeout:   1800 secs
```

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

Table 6: show flow monitor monitor-name Field Descriptions

Field	Description
Flow Monitor	Name of the flow monitor that you configured.
Description	Description that you configured or the monitor, or the default description "User defined".
Flow Record	Flow record assigned to the flow monitor.
Flow Exporter	Exporters that are assigned to the flow monitor.
Cache	Information about the cache for the flow monitor.
Type	Flow monitor cache type. The 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.

Field	Description
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:

```
Router# show flow monitor FLOW-MONITOR-1 cache

  Cache type:                          Normal
  Cache size:                            4096
  Current entries:                          8
  High Watermark:                          10
  Flows added:                           1560
  Flows aged:                            1552
    - Active timeout   (  1800 secs)       24
    - Inactive timeout (    15 secs)     1528
    - Event aged                            0
    - Watermark aged                        0
    - Emergency aged                        0
IP TOS:                 0x00
IP PROTOCOL:            6
IPV4 SOURCE ADDRESS:    10.10.10.2
IPV4 DESTINATION ADDRESS: 172.16.10.2
TRNS SOURCE PORT:       20
TRNS DESTINATION PORT:  20
INTERFACE INPUT:        Et0/0
FLOW SAMPLER ID:        0
ip source as:           0
ip destination as:      0
ipv4 next hop address:  172.16.7.2
ipv4 source mask:       /0
ipv4 destination mask:  /24
tcp flags:              0x00
interface output:       Et1/0
counter bytes:          198520
counter packets:        4963
timestamp first:        10564356
timestamp last:         12154104
```

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

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

Field	Description
Cache type	Flow monitor cache type. The possible values are: • Immediate—Flows are expired immediately. • Normal—Flows are expired normally. • Permanent—Flows are never expired.
Cache Size	Number of entries in the cache.
Current entries	Number of entries in the cache that are in use.
High Watermark	Highest number of cache entries seen.
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.
Event aged	Number of flows that have been aged by an event such as using the **force-export** option for the **clear flow monitor** command.
Watermark aged	Number of flows that have been aged because they exceeded the maximum high watermark value.
Emergency aged	Number of flows that have been aged because the cache size was exceeded.
IP TOS	IP type of service (ToS) value.
IP PROTOCOL	Protocol number.
IPV4 SOURCE ADDRESS	IPv4 source address.
IPV4 DESTINATION ADDRESS	IPv4 destination address.
TRNS SOURCE PORT	Source port for the transport protocol.
TRNS DESTINATION PORT	Destination port for the transport protocol.
INTERFACE INPUT	Interface on which the input is received.
FLOW SAMPLER ID	Flow sampler ID number.
ip source as	Border Gateway Protocol (BGP) source autonomous system number.
ip destination as	BGP destination autonomous system number.

Field	Description
ipv4 next hop address	IPv4 address of the next hop to which the packet is forwarded.
ipv4 source mask	IPv4 source address mask.
ipv4 destination mask	IPv4 destination address mask.
tcp flags	Value of the TCP flags.
interface output	Interface on which the input is transmitted.
counter bytes	Number of bytes that have been counted.
counter packets	Number of packets that have been counted.
timestamp first	Time stamp of the first packet in the flow.
timestamp last	Time stamp of the last packet in the flow.

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

```
Router# show flow monitor FLOW-MONITOR-1 cache format table

  Cache type:                           Normal
  Cache size:                             4096
  Current entries:                           4
  High Watermark:                            6
  Flows added:                              90
  Flows aged:                               86
    - Active timeout   (  1800 secs)         0
    - Inactive timeout (    15 secs)        86
    - Event aged                             0
    - Watermark aged                         0
    - Emergency aged                         0
IP TOS  IP PROT  IPV4 SRC ADDR   IPV4 DST ADDR   TRNS SRC PORT  TRNS DST PORT
======  =======  ==============  ==============  =============  ===============
0x00          1  10.251.10.1     172.16.10.2                 0             02
0x00          1  10.251.10.1     172.16.10.2                 0          20484
0xC0         17  172.16.6.1      224.0.0.9                 520           5202
0x00          6  10.10.11.1      172.16.10.5                25            252
Router#
```

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:

```
Router# show flow monitor name FLOW-MONITOR-IPv6 cache format record

  Cache type:                           Normal
  Cache size:                             4096
  Current entries:                           6
  High Watermark:                            8
  Flows added:                            1048
  Flows aged:                             1042
    - Active timeout   (  1800 secs)        11
    - Inactive timeout (    15 secs)      1031
    - Event aged                             0
    - Watermark aged                         0
```

```
        - Emergency aged                    0
IPV6 FLOW LABEL:          0
IPV6 EXTENSION MAP:       0x00000040
IPV6 SOURCE ADDRESS:      2001:DB8:1:ABCD::1
IPV6 DESTINATION ADDRESS: 2001:DB8:4:ABCD::2
TRNS SOURCE PORT:         3000
TRNS DESTINATION PORT:    55
INTERFACE INPUT:          Et0/0
FLOW DIRECTION:           Input
FLOW SAMPLER ID:          0
IP PROTOCOL:              17
IP TOS:                   0x00
ip source as:             0
ip destination as:        0
ipv6 next hop address:    ::
ipv6 source mask:         /48
ipv6 destination mask:    /0
tcp flags:                0x00
interface output:         Null
counter bytes:            521192
counter packets:          9307
timestamp first:          9899684
timestamp last:           11660744
```

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

Table 8: show flow monitor monitor-name cache format record Field Descriptions

Field	Description
Cache type	Flow monitor cache type. The possible values are: • Immediate—Flows are expired immediately. • Normal—Flows are expired normally. • Permanent—Flows are never expired.
Cache Size	Number of entries in the cache.
Current entries	Number of entries in the cache that are in use.
High Watermark	Highest number of cache entries seen.
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.
Event aged	Number of flows that have been aged by an event such as using the **force-export** option for the **clear flow monitor** command.
Watermark aged	Number of flows that have been aged because they exceeded the maximum high watermark value.

Field	Description
Emergency aged	Number of flows that have been aged because the cache size was exceeded.
IPV6 FLOW LABEL	Label number for the flow.
IPV6 EXTENSION MAP	Pointer to the IPv6 extensions.
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.
INTERFACE INPUT	Interface on which the input is received.
FLOW DIRECTION	Input or output.
FLOW SAMPLER ID	Flow sampler ID number.
IP PROTOCOL	IP protocol number.
IP TOS	IP ToS number.
ip source as	BGP source autonomous system number.
ip destination as	BGP destination autonomous system number.
ipv6 next hop address	IPv4 address of the next hop to which the packet is forwarded.
ipv6 source mask	IPv6 source address mask.
ipv6 destination mask	IPv6 destination address mask.
tcp flags	Value of the TCP flags.
interface output	Interface on which the input is transmitted.
counter bytes	Number of bytes that have been counted.
counter packets	Number of packets that have been counted.
timestamp first	Time stamp of the first packet in the flow.
timestamp last	Time stamp of the last packet in the flow.

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

```
Router# show flow monitor FLOW-MONITOR-1 statistics

  Cache type:                         Normal
  Cache size:                           4096
  Current entries:                         4
  High Watermark:                          6
```

```
Flows added:                                116
Flows aged:                                 112
   - Active timeout  (  1800 secs)           0
   - Inactive timeout (    15 secs)         112
   - Event aged                              0
   - Watermark aged                          0
   - Emergency aged                          0
```

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

Table 9: show flow monitor monitor-name statistics Field Descriptions

Field	Description
Cache Type	Flow monitor cache type. The possible values are: • Immediate—Flows are expired immediately. • Normal—Flows are expired normally. • Permanent—Flows are never expired.
Cache Size	Size of the cache.
Current entries	Number of entries in the cache that are in use.
High Watermark	Highest number of cache entries seen.
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.
Event aged	Number of flows that have been aged by an event such as using the **force-export** option for the **clear flow monitor** command.
Watermark aged	Number of flows that have been aged because they exceeded the maximum high watermark value.
Emergency aged	Number of flows that have been aged because the cache size was exceeded.

Related Commands

Command	Description
clear flow monitor	Clears the flow monitor.
debug flow monitor	Enables debugging output for flow monitors.

show flow monitor cache aggregate

To display aggregated flow statistics from a flow monitor cache, use the **show flow monitor cache aggregate** command in privileged EXEC mode.

show flow monitor [**name**] *monitor-name* **cache aggregate** {*options* [. . . *options*] [**collect** *options* [. . . *options*]] | **record** *record-name*} [**format** {**csv** | **record** | **table**}]

Syntax Description

name	(Optional) Specifies the name of a flow monitor.
monitor-name	Name of a flow monitor that was previously configured.
options	Fields upon which aggregation is performed; and from which additional data from the cache is displayed when the **collect** keyword is used. You can specify multiple values for the *options* argument. See the "Usage Guidelines" section.
collect	(Optional) Displays additional data from the cache. See the "Usage Guidelines" section.
record *record-name*	Specifies the name of a user-defined flow record or a predefined flow record. See the first table below for a listing of the available predefined records and their definitions.
format	(Optional) Specifies the use of one of the format options for formatting the display output.
csv	Displays the flow monitor cache contents in comma-separated variables (CSV) format.
record	Displays the flow monitor cache contents in record format.
table	Displays the flow monitor cache contents in table format.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(22)T	This command was introduced.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines

Flexible NetFlow—Top N Talkers Support

The **show flow monitor cacheaggregate** command is one of a set of three commands that make up the Flexible NetFlow—Top N Ta lkers Support feature. The Flexible NetFlow—Top N Talkers Support feature is used to manipulate the display output from the Flexible NetFlow cache to facilitate the analysis of network traffic.

The other two commands that make up the Flexible NetFlow—Top N Talkers Support feature are **show flow monitor cache filter** and **show flow monitor cache sort**. The three commands can be used together or on their own, depending on your requirements. For more detailed information about these commands, see the **show flow monitor cache filter** command and the **show flow monitor cache sort** command. For information about how the three commands are used together, refer to the "Configuring Cisco IOS Flexible NetFlow—Top N Talkers Support" module in the *Configuring Cisco IOS Flexible NetFlow Configuration Guide.*

Flow Aggregation

Flow aggregation using the **showflow monitor cache aggregate** command allows you to dynamically display the flow information in a cache using a different flow record than the cache was originally created from. Only the fields in the cache will be available for the aggregated flows.

Note The key and nonkey fields in the flows are defined in the flow record that you assigned to the flow monitor from which the cache data is being aggregated.

Aggregation helps you achieve a higher-level view of the traffic in your network by combining flow data from multiple flows based on the criteria that interest you, for example, displaying flow data for:

- All the HTTP traffic in your network.

- All the traffic being forwarded to a specific Border Gateway Protocol (BGP) next hop.

- Identifying a device that is sending several types of traffic to one or more hosts in your network, perhaps as part of a denial of service (DoS) attack.

Aggregation options Argument

The options that you can use for the *options* argument of the **show flow monitor cache aggregate** command are dependent on the fields that are used for the user-defined flow record that you configured for the flow monitor using the **record** command. To identify the options that you can use, use the **show flow record**record-name command in privileged EXEC mode, where *record-name* is the name of the record that you configured for the flow monitor.

For example, if you assigned the "NetFlow Original" predefined record to a flow monitor, you use the **show flow record netflow-original** command to display its key (match) and nonkey (collect) fields. The following is partial output from the **show flow record netflow-original** command:

```
flow record netflow-original:
  Description:       Traditional IPv4 input NetFlow with origin ASs
  No. of users:      2
  Total field space: 53 bytes
  Fields:
    match ipv4 tos
    match ipv4 protocol
    match ipv4 source address
    match ipv4 destination address
.
.
.
    collect counter packets
```

```
collect timestamp sys-uptime first
collect timestamp sys-uptime last
```

The fields from this partial output that you can use for the *option* argument follow the **match** (key fields) and **collect** (nonkey fields) words. For example, you can use the "ipv4 tos" field to aggregate the flows as shown in the first example in the "Examples section.

Cache Data Fields Displayed

By default the data fields from the cache that are shown in the display output of the **show flow monitor cache aggregate** command are limited to the field used for aggregation and the counter fields such as flows, number of bytes, and the number of packets. The following is partial output from the **show flow monitor FLOW-MONITOR-3 cache aggregate ipv4 destination address** command:

```
IPV4 DST ADDR        flows       bytes        pkts
===============   ==========  ==========  ==========
224.192.16.1             2       97340        4867
224.192.18.1             3       96080        4804
224.192.16.4             4       79760        3988
224.192.45.12            3       77480        3874
255.255.255.255          1          52           1
```

Notice that the data contains only the IPv4 destination addresses for which flows have been aggregated and the counter values.

The flow monitor (FLOW-MONITOR-3) referenced by the **show flow monitor FLOW-MONITOR-3 cache aggregate ipv4 destination address** command uses the "NetFlow Original" predefined record, which contains the following key and nonkey fields:

- match ipv4 tos

- match ipv4 protocol

- match ipv4 source address

- match ipv4 destination address

- match transport source-port

- match transport destination-port

- match interface input

- match flow sampler

- collect routing source as

- collect routing destination as

- collect routing next-hop address ipv4

- collect ipv4 source mask

- collect ipv4 destination mask

- collect transport tcp flags

- collect interface output

- collect counter bytes

- collect counter packets

- collect timestamp sys-uptime first

- collect timestamp sys-uptime last

The **collect** keyword is used to include additional cache data in the display output of the **show flow monitor cache aggregate** command. The following partial output from the **show flow monitor FLOW-MONITOR-3 cache aggregate ipv4 destination address collect transport tcp flags** command shows the transport TCP flags data from the cache:

```
IPV4 DST ADDR    tcp flags      flows       bytes       pkts
===============  =========  ==========  ==========  ==========
224.192.16.1     0x00                4      165280        8264
224.192.18.1     0x00                4      158660        7933
224.192.16.4     0x00                3      146740        7337
224.192.45.12    0x00                4      145620        7281
255.255.255.255  0x00                1          52           1
224.0.0.13       0x00                1          54           1
```

You can add cache data fields after the **collect** keyword to show additional data from the cache in the display output of the **show flow monitor cache aggregate** command.

Keywords and Descriptions for the *record* Argument

The table below describes the keywords for the *record* argument.

Table 10: Keywords and Descriptions for the Aggregate record Argument

Keyword	Description	IPv4 Support	IPv6 Support
as	Autonomous system record.	Yes	Yes
as-tos	Autonomous system and ToS record.	Yes	No
bgp-nexthop-tos	BGP next-hop and ToS record.	Yes	No
bgp-nexthop	BGP next-hop record.	No	Yes
destination-prefix	Destination prefix record. **Note** For IPv6, a minimum prefix mask length of 0 bits is assumed.	Yes	Yes
destination-prefix-tos	Destination prefix and ToS record.	Yes	No
original-input	Traditional IPv4 input NetFlow.	Yes	Yes
original-output	Traditional IPv4 output NetFlow.	Yes	Yes
prefix	Source and destination prefixes record. **Note** For IPv6, a minimum prefix mask length of 0 bits is assumed.	Yes	Yes
prefix-port	Prefix port record. **Note** The **peer** keyword is not available for this record.	Yes	No

Keyword	Description	IPv4 Support	IPv6 Support
prefix-tos	Prefix ToS record.	Yes	No
protocol-port	Protocol ports record. **Note** The **peer** keyword is not available for this record.	Yes	Yes
protocol-port-tos	Protocol port and ToS record. **Note** The **peer** keyword is not available for this record.	Yes	No
source-prefix	Source autonomous system and prefix record. **Note** For IPv6, a minimum prefix mask length of 0 bits is assumed.	Yes	Yes
source-prefix-tos	Source prefix and ToS record.	Yes	No

Examples

The following example aggregates the flow monitor cache data on the destination and source IPv4 addresses:

```
Router# show flow monitor FLOW-MONITOR-1 cache aggregate ipv4 destination address ipv4
source address

Processed 26 flows
Aggregated to 17 flows
IPV4 SRC ADDR    IPV4 DST ADDR       flows       bytes        pkts
===============  ===============  ==========  ==========  ==========
10.251.10.1      172.16.10.2               2     1400828        1364
192.168.67.6     172.16.10.200             1       19096         682
10.234.53.1      172.16.10.2               3       73656        2046
172.30.231.193   172.16.10.2               3       73616        2045
10.10.10.2       172.16.10.2               2       54560        1364
192.168.87.200   172.16.10.2               2       54560        1364
10.10.10.4       172.16.10.4               1       27280         682
10.10.11.1       172.16.10.5               1       27280         682
10.10.11.2       172.16.10.6               1       27280         682
10.10.11.3       172.16.10.7               1       27280         682
10.10.11.4       172.16.10.8               1       27280         682
10.1.1.1         172.16.10.9               1       27280         682
10.1.1.2         172.16.10.10              1       27280         682
10.1.1.3         172.16.10.11              1       27280         682
172.16.1.84      172.16.10.19              2       54520        1363
172.16.1.85      172.16.10.20              2       54520        1363
172.16.6.1       224.0.0.9                 1          52           1
```

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

Table 11: show flow monitor cache aggregate Field Descriptions

Field	Description
IPV4 SOURCE ADDRESS	IPv4 source address.

Field	Description
IPV4 DESTINATION ADDRESS	IPv4 destination address.
flows	Numbers of flows associated with the source/destination IP address combination
bytes	Number of bytes contained in the flows.
packets	Number of packets contained in the flows.

Related Commands

Command	Description
show flow monitor cache filter	Filters the display output of flow records from a flow monitor cache.
show flow monitor cache sort	Sorts the display output of flow records from a flow monitor cache.

show flow monitor cache filter

To filter the display output of statistics from the flows in a flow monitor cache, use the **show flow monitor cache filter** command in privileged EXEC mode.

show flow monitor [**name**] *monitor-name* **cache filter** *options* [**regexp** *regexp*] [**. . .** *options* [**regexp** *regexp*]] [**format** {**csv** | **record** | **table**}]

Syntax Description

name	(Optional) Specifies the name of a flow monitor.
monitor-name	Name of a flow monitor that was previously configured.
options	Fields upon which filtering is performed. You can specify multiple values for the *options* argument. See the "Usage Guidelines" section.
regexp *regexp*	(Optional) Match the field specified with the *options* argument against a regular expression. See the "Usage Guidelines" section.
format	(Optional) Specifies the use of one of the format options for formatting the display output.
csv	Displays the flow monitor cache contents in comma-separated variables (CSV) format.
record	Displays the flow monitor cache contents in record format.
table	Displays the flow monitor cache contents in table format.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(22)T	This command was introduced.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines

Flexible NetFlow—Top N Talkers Support

The **show flow monitor cache filter** command is one of a set of three commands that make up the Flexible NetFlow—Top N Talkers Support feature. The Flexible NetFlow—Top N Talkers Support feature is used to manipulate the display output from the Flexible NetFlow cache to facilitate the analysis of network traffic.

The other two commands that make up the Flexible NetFlow—Top N Talkers Support feature are **show flow monitor cache sort** and **show flow monitor cache aggregate**. The three commands can be used together or on their own, depending on your requirements. For more detailed information about these commands, see the **show flow monitor cache sort** command and the **show flow monitor cache aggregate** command. For

information about how the three commands are used together, refer to the "Configuring Cisco IOS Flexible NetFlow—Top N Talkers Support" module in the *Configuring Cisco IOS Flexible NetFlow Configuration Guide.*

Filter options Argument

The options that you can use for the *options* argument of the **show flow monitor cache filter** command are dependent on the fields that are used for the record that you configured for the flow monitor using the **record** command. To identify the options that you can use, use the **show flow record** *record-name* command in privileged EXEC mode, where *record-name* is the name of the record that you configured for the flow monitor.

For example, if you assigned the "NetFlow Original" predefined record to a flow monitor, you use the **show flow record netflow-original** command to display its key (match) and nonkey (collect) fields. The following is partial output from the **show** command:

```
flow record netflow-original:
  Description:        Traditional IPv4 input NetFlow with origin ASs
  No. of users:       2
  Total field space:  53 bytes
  Fields:
    match ipv4 tos
    match ipv4 protocol
    match ipv4 source address
    match ipv4 destination address
.
.
.
    collect counter packets
    collect timestamp sys-uptime first
    collect timestamp sys-uptime last
```

The fields from this partial output that you can use for the *option* argument follow the **match** (key fields) and **collect** (nonkey fields) words. For example, you can use the "ipv4 tos" field to filter the flows as shown in the first example in the "Examples" section.

Filtering Criteria

The following are examples of the types of filtering criteria available for the **show flow monitorcache filter** command:

- Perform an exact match on any numerical fields in either decimal or hexadecimal format. For example, these two commands match flows in the flow monitor cache that contain either "0xA001" or "1":

  - **show flow monitor FLOW-MONITOR-1 cache filter transport source-port 0xA001**
  - **show flow monitor FLOW-MONITOR-1 cache filter transport source-port 1**

- Perform a match on a range for any numerical fields in either decimal or hexadecimal format. For example, these two commands match flows in the flow monitor cache that contain either "0xA000 0xB000" or "1 1024":

  - **show flow monitor FLOW-MONITOR-1 cache filter transport source-port 0xA000 0xB000**
  - **show flow monitor FLOW-MONITOR-1 cache filter transport source-port 1 1024**

- Perform an exact match for any alphanumerical field. For example, this command matches flows in the flow monitor cache having a MAC address of ABCD:0012:01FE:

  - **show flow monitor FLOW-MONITOR-1 cache filter datalink mac source address ABCD:0012:01FE**

- Perform a regular-expression match on any alphanumerical field. For example, this command matches flows in the flow monitor cache having a MAC address that starts with ABCD:

  - **show flow monitor FLOW-MONITOR-1 cache filter datalink mac source address regexp ABCD:***

- Perform a match on flag fields with an implicit <and>. For example, this command matches flows in the flow monitor cache that contain the **urg** and **syn** TCP flags:

  - **show flow monitor FLOW-MONITOR-1 cache filter transport tcp flags urg syn**

- Perform a match against flags that are not present. For example, this command matches flows in the flow monitor cache that contain the **syn** and **rst** TCP flags and do not contain the **urg** and **fin** TCP flags:

  - **show flow monitor FLOW-MONITOR-1 cache filter transport tcp flags syn rst not urg fin**

- Perform an exact match on an IP address field. For example, this command matches flows in the flow monitor cache that contain the source IPv4 address "192.168.0.1":

  - **show flow monitor FLOW-MONITOR-1 cache filter ipv4 source address 192.168.0.1**

- Perform a prefix match on an IPv4 or IPv6 address field. For example, these two commands match flows in the flow monitor cache that contain either "192.168.0.0 255.255.0.0" or "7:20ac::/64":

  - **show flow monitor FLOW-MONITOR-1 cache filter ipv4 source address 192.168.0.0 255.255.0.0**
  - **show flow monitor FLOW-MONITOR-1 cache filter ipv6 source address 7:20ac::/64**

- Perform a match on a range of relative time stamps. For example, this command matches flows in the flow monitor cache that were created within the last "500" seconds:

  - **show flow monitor FLOW-MONITOR-1 cache filter timestamp sys-uptime first 0 500 seconds**

- Perform a match on range of the time stamp that is configured (uptime or absolute). For example, this command matches flows in the flow monitor cache that were created between 0800 and 0815, within the last 24 hours:

  - **show flow monitor FLOW-MONITOR-1 cache filter timestamp sys-uptime last 08:00:00 08:15:00 t**

- Perform an exact match on an interface. For example, this command matches flows in the flow monitor cache which are received on Ethernet interface 0/0.

  - **show flow monitor FLOW-MONITOR-1 cache filter interface input Ethernet0/0**

- Perform a regular-expression match on an interface. For example, this command matches flows in the flow monitor cache that begin with Ethernet0/ and have either 1, 2, or 3 as the port number:

  - **show flow monitor FLOW-MONITOR-1 cache filter interface input regexp Ethernet0/1**

Regular Expressions

The table below shows the syntax for regular expressions.

Table 12: Syntax for Regular Expressions

Option	Description
*	Match zero or more characters in this position.
?	Match any one character in this position.

Option	Description
|	Match any one character in this position.
(|)	Match one of a choice of characters in a range. For example, aa:(0033|4455):3456 matches either aa:0033:3456 or aa:4455:3456.
[]	Match any character in the range specified, or one of the special characters. For example, [0-9] is all of the digits. [*] is the "*" character, and [[] is the "[" character.

Examples

The following example filters the flow monitor cache data on the source IPv4 address of 10.234.53.1:

```
Router# show flow monitor FLOW-MONITOR-1 cache filter ipv4 source address 10.234.53.1

  Cache type:                       Normal
  Cache size:                         4096
  Current entries:                      26
  High Watermark:                       26
  Flows added:                          87
  Flows aged:                           61
    - Active timeout   (  1800 secs)     0
    - Inactive timeout (    15 secs)    61
    - Event aged                         0
    - Watermark aged                     0
    - Emergency aged                     0
IPV4 SOURCE ADDRESS:      10.234.53.1
IPV4 DESTINATION ADDRESS: 172.16.10.2
TRNS SOURCE PORT:         0
TRNS DESTINATION PORT:    2048
INTERFACE INPUT:          Et0/0.1
FLOW SAMPLER ID:          0
IP TOS:                   0x00
IP PROTOCOL:              1
ip source as:             0
ip destination as:        0
ipv4 next hop address:    172.16.7.2
ipv4 source mask:         /0
ipv4 destination mask:    /24
tcp flags:                0x00
interface output:         Et1/0.1
counter bytes:            24724
counter packets:          883
timestamp first:          16:03:56.007
timestamp last:           16:27:07.063
IPV4 SOURCE ADDRESS:      10.234.53.1
IPV4 DESTINATION ADDRESS: 172.16.10.2
TRNS SOURCE PORT:         20
TRNS DESTINATION PORT:    20
INTERFACE INPUT:          Et0/0.1
FLOW SAMPLER ID:          0
IP TOS:                   0x00
IP PROTOCOL:              6
ip source as:             0
ip destination as:        0
ipv4 next hop address:    172.16.7.2
ipv4 source mask:         /0
ipv4 destination mask:    /24
tcp flags:                0x00
interface output:         Et1/0.1
counter bytes:            35320
```

```
counter packets:          883
timestamp first:          16:03:56.267
timestamp last:           16:27:07.323
IPV4 SOURCE ADDRESS:      10.234.53.1
IPV4 DESTINATION ADDRESS: 172.16.10.2
TRNS SOURCE PORT:         21
TRNS DESTINATION PORT:    21
INTERFACE INPUT:          Et0/0.1
FLOW SAMPLER ID:          0
IP TOS:                   0x00
IP PROTOCOL:              6
ip source as:             0
ip destination as:        0
ipv4 next hop address:    172.16.7.2
ipv4 source mask:         /0
ipv4 destination mask:    /24
tcp flags:                0x00
interface output:         Et1/0.1
counter bytes:            35320
counter packets:          883
timestamp first:          16:03:56.327
timestamp last:           16:27:07.363
Matched 3 flows
```

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

Table 13: show flow monitor monitor-name cache filter Field Descriptions

Field	Description
Cache type	Flow monitor cache type. The possible values are: • Immediate—Flows are expired immediately. • Normal—Flows are expired normally. • Permanent—Flows are never expired.
Cache Size	Number of entries in the cache.
Current entries	Number of entries in the cache that are in use.
High Watermark	Highest number of cache entries seen.
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.
Event aged	Number of flows that have been aged by an event such as using the **force-export** option for the **clear flow monitor** command.
Watermark aged	Number of flows that have been aged because they exceeded the maximum high watermark value.

Field	Description
Emergency aged	Number of flows that have been aged because the cache size was exceeded.
IPV4 SOURCE ADDRESS	IPv4 source address.
IPV4 DESTINATION ADDRESS	IPv4 destination address.
TRNS SOURCE PORT	source port for the transport protocol.
TRNS DESTINATION PORT	Destination port for the transport protocol.
INTERFACE INPUT	Interface on which the input is received.
FLOW DIRECTION	Input or output.
FLOW SAMPLER ID	Flow sampler ID number.
IP PROTOCOL	IP protocol number.
IP TOS	IP ToS number.
ip source as	BGP source autonomous system number.
ip destination as	BGP destination autonomous system number.
ipv4 next hop address	IPv4 address of the next hop to which the packet is forwarded.
ipv4 source mask	IPv4 source address mask.
ipv4 destination mask	IPv4 destination address mask.
tcp flags	Value of the TCP flags.
interface output	Interface on which the input is transmitted.
counter bytes	Number of bytes that have been counted.
counter packets	Number of packets that have been counted.
timestamp first	Time stamp of the first packet in the flow.
timestamp last	Time stamp of the last packet in the flow.

Related Commands

Command	Description
show flow monitor cache aggregate	Displays aggregated flow records of flows in a flow monitor cache.
show flow monitor cache sort	Sorts the display output of flow records from a flow monitor cache.

show flow monitor cache sort

To sort the display output of statistics from the flows in a flow monitor cache, use the **show flow monitor cache sort** command in privileged EXEC mode.

show flow monitor [**name**] *monitor-name* **cache sort** *options* [**top** [*number*]] [**format** {**csv** | **record** | **table**}]

<table>
<tr><td rowspan="9" valign="top">Syntax Description</td><td>**name**</td><td>(Optional) Specifies the name of a flow monitor.</td></tr>
<tr><td>*monitor-name*</td><td>Name of a flow monitor that was previously configured.</td></tr>
<tr><td>options</td><td>Fields upon which aggregation can be performed. See the "Usage Guidelines" section.</td></tr>
<tr><td>**top**</td><td>(Optional) Limits the display output to the 20 highest volume flows (top talkers) unless overridden by the specification of a value for the *number* argument.</td></tr>
<tr><td>*number*</td><td>(Optional) Overrides the default value of top talkers to display.</td></tr>
<tr><td>**format**</td><td>(Optional) Specifies the use of one of the format options for formatting the display output.</td></tr>
<tr><td>**csv**</td><td>Displays the flow monitor cache contents in comma-separated variables (CSV) format.</td></tr>
<tr><td>**record**</td><td>Displays the flow monitor cache contents in record format.</td></tr>
<tr><td>**table**</td><td>Displays the flow monitor cache contents in table format.</td></tr>
</table>

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(22)T	This command was introduced.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7200 and Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines

Flexible NetFlowNetFlow—Top N Talkers Support

The **show flow monitor cache sort** command is one of a set of three commands that make up the Flexible NetFlow—Top N Talkers Support feature. The Flexible NetFlow—Top N Talkers Support feature is used to manipulate the display output from the Flexible NetFlow cache to facilitate the analysis of network traffic.

The other two commands that make up the Flexible NetFlow—Top N Talkers Support feature are **show flow monitor cache filter** and **show flow monitor cache aggregate**. The three commands can be used together or on their own, depending on your requirements. For more detailed information about these commands, see

the **show flow monitor cache filter** command and the **show flow monitor cache aggregate** command. For information about how the three commands are used together, refer to the "Configuring Cisco IOS Flexible NetFlow—Top N Talkers Support" module in the *Configuring Cisco IOS Flexible NetFlow Configuration Guide.*

Flow Sorting

The flow sorting function of the Flexible NetFlow—Top N Talkers Support feature sorts flow data from the Flexible NetFlow cache based on the criteria that you specify, and displays the data. You can also use the flow sorting function of the Flexible NetFlow—Top N Talkers Support feature to limit the display output to a specific number of entries (Top N Talkers) by using the **top** keyword.

Sort options Argument

The options that you can use for the *options* argument of the **show flow monitor cache filter** command are dependent on the fields that are used for the record that you configured for the flow monitor using the **record** command. To identify the options that you can use, use the **show flow record** *record-name* command in privileged EXEC mode, where *record-name* is the name of the record that you configured for the flow monitor.

For example, if you assigned the "NetFlow Original" predefined record to a flow monitor, you use the **show flow record netflow-original** command to display its key (match) and nonkey (collect) fields. The following is partial output from the **show** command:

```
flow record netflow-original:
  Description:        Traditional IPv4 input NetFlow with origin ASs
  No. of users:       2
  Total field space:  53 bytes
  Fields:
    match ipv4 tos
    match ipv4 protocol
    match ipv4 source address
    match ipv4 destination address
.
.
.
    collect counter packets
    collect timestamp sys-uptime first
    collect timestamp sys-uptime last
```

The fields from this partial output that you can use for the *option* argument follow the **match** (key fields) and **collect** (nonkey fields) words. For example, you can use the "ipv4 tos" field to sort the flows as shown in the first example in the "Examples" section.

Examples

The following example sorts the flow monitor cache data on the IPv4 ToS value and limits the display output to the top two flows:

```
Router# show flow monitor FLOW-MONITOR-3 cache sort ipv4 tos top 2

Processed 17 flows
Aggregated to 17 flows
Showing the top 2 flows
IPV4 SOURCE ADDRESS:       10.1.1.1
IPV4 DESTINATION ADDRESS:  224.192.16.1
TRNS SOURCE PORT:          0
TRNS DESTINATION PORT:     3073
INTERFACE INPUT:           Et0/0
FLOW SAMPLER ID:           0
IP TOS:                    0x55
IP PROTOCOL:               1
```

```
ip source as:             0
ip destination as:        0
ipv4 next hop address:    0.0.0.0
ipv4 source mask:         /24
ipv4 destination mask:    /0
tcp flags:                0x00
interface output:         Null
counter bytes:            33680
counter packets:          1684
timestamp first:          18:39:27.563
timestamp last:           19:04:28.459

IPV4 SOURCE ADDRESS:      10.1.1.1
IPV4 DESTINATION ADDRESS: 224.192.16.1
TRNS SOURCE PORT:         0
TRNS DESTINATION PORT:    0
INTERFACE INPUT:          Et0/0
FLOW SAMPLER ID:          0
IP TOS:                   0x55
IP PROTOCOL:              1
ip source as:             0
ip destination as:        0
ipv4 next hop address:    0.0.0.0
ipv4 source mask:         /24
ipv4 destination mask:    /0
tcp flags:                0x00
interface output:         Et3/0.1
counter bytes:            145040
counter packets:          7252
timestamp first:          18:42:34.043
timestamp last:           19:04:28.459
```

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

Table 14: show flow monitor monitor-name cache sort Field Descriptions

Field	Description
IPV4 SOURCE ADDRESS	IPv4 source address.
IPV4 DESTINATION ADDRESS	IPv4 destination address.
TRNS SOURCE PORT	source port for the transport protocol.
TRNS DESTINATION PORT	Destination port for the transport protocol.
INTERFACE INPUT	Interface on which the input is received.
FLOW DIRECTION	Input or output.
FLOW SAMPLER ID	Flow sampler ID number.
IP PROTOCOL	IP protocol number.
IP TOS	IP ToS number.
ip source as	BGP source autonomous system number.
ip destination as	BGP destination autonomous system number.
ipv4 next hop address	IPv4 address of the next hop to which the packet is forwarded.

Field	Description
ipv4 source mask	IPv4 source address mask.
ipv4 destination mask	IPv4 destination address mask.
tcp flags	Value of the TCP flags.
interface output	Interface on which the input is transmitted.
counter bytes	Number of bytes that have been counted.
counter packets	Number of packets that have been counted.
timestamp first	Time stamp of the first packet in the flow.
timestamp last	Time stamp of the last packet in the flow.

Related Commands

Command	Description
show flow monitor cache aggregate	Displays aggregated flow records of flows in a flow monitor cache.
show flow monitor cache filter	Filters the display output of flow records from a flow monitor cache.

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 [{[**name**] *record-name* | **netflow-original** | **netflow** {**ipv4** | **ipv6**} *record* [**peer**]}]

Cisco Catalyst 6500 Switches in Cisco IOS Release 12.2(50)SY
show flow record [{[**name**] *record-name* | **platform-original** {**ipv4** | **ipv6**} *record*}]

Cisco IOS XE Release 3.2SE
show flow record [{[**name**] *record-name*}]

Syntax Description

name	(Optional) Specifies the name of a flow record.
record-name	(Optional) Name of a user-defined flow record that was previously configured.
netflow-original	(Optional) Specifies the Flexible NetFlow implementation of original NetFlow with origin autonomous systems.
netflow ipv4	(Optional) Configures the flow monitor to use one of the IPv4 predefined records.
netflow ipv6	(Optional) Configures the flow monitor to use one of the IPv6 predefined records.
record	(Optional) Name of the predefined record. See the first table below for a listing of the available records and their definitions.
peer	(Optional) Configures the flow monitor to use one of the predefined records with peer autonomous systems. The **peer** keyword is not supported for every type of Flexible NetFlow predefined record. See the first table below.
platform-original ipv4	Configures the flow monitor to use one of the predefined IPv4 records.
platform-original ipv6	Configures the flow monitor to use one of the predefined IPv6 records.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.4(20)T	This command was modified. The **ipv6** keyword was added.

Release	Modification
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was modified. The **netflow-original**, **netflow ipv4**, and **netflow ipv6** keywords were removed. The **platform-originalipv4** and **platform-originalipv6** keywords were added.
Cisco IOS XE Release 3.2SE	This command was modified. The **netflow-original**, **netflow ipv4**, and **netflow ipv6** keywords were removed.

Usage Guidelines   The table below describes the keywords and descriptions for the *record* argument.

Table 15: Keywords and Descriptions for the record Argument

Keyword	Description	IPv4 Support	IPv6 Support
as	Autonomous system record.	Yes	Yes
as-tos	Autonomous system and Type of Service (ToS) record.	Yes	—
bgp-nexthop-tos	BGP next-hop and ToS record.	Yes	—
bgp-nexthop	BGP next-hop record.	—	Yes
destination	Original platform IPv4/IPv6 destination record.	Yes	Yes
destination-prefix	Destination prefix record. **Note** For IPv6, a minimum prefix mask length of 0 bits is assumed.	Yes	Yes
destination-prefix-tos	Destination prefix and ToS record.	Yes	—
destination-source	Original platform IPv4/IPv6 destination-source record.	Yes	Yes
full	Original platform IPv4/IPv6 full record.	Yes	Yes
interface-destination	Original platform IPv4/IPv6 interface-destination record.	Yes	Yes
interface-destination-source	Original platform IPv4/IPv6 interface-destination-source record.	Yes	Yes
interface-full	Original platform IPv4/IPv6 interface-full record.	Yes	Yes
interface-source	Original platform IPv4/IPv6 interface-source only record.	Yes	Yes
original-input	Traditional IPv4 input NetFlow.	Yes	Yes

Keyword	Description	IPv4 Support	IPv6 Support
original-output	Traditional IPv4 output NetFlow.	Yes	Yes
prefix	Source and destination prefixes record. **Note** For IPv6, a minimum prefix mask length of 0 bits is assumed.	Yes	Yes
prefix-port	Prefix port record. **Note** The **peer** keyword is not available for this record.	Yes	—
prefix-tos	Prefix ToS record.	Yes	
protocol-port	Protocol ports record. **Note** The **peer** keyword is not available for this record.	Yes	Yes
protocol-port-tos	Protocol port and ToS record. **Note** The **peer** keyword is not available for this record.	Yes	—
source	Original platform IPv4/IPv6 source only record.	Yes	Yes
source-prefix	Source autonomous system and prefix record. **Note** For IPv6, a minimum prefix mask length of 0 bits is assumed.	Yes	Yes
source-prefix-tos	Source prefix and ToS record.	Yes	—

Examples

The following example displays the status and statistics for the original Flexible NetFlow record:

```
Router# show flow record FLOW-RECORD-1 platform-original ipv4 destination

flow record FLOW_RECORD-1:
  Description: Flow Record for IPv4 traffic
  No. of users:        3
  Total field space:  53 bytes
  Fields:
    match interface input
    match transport destination-port
    match transport source-port
    match ipv4 destination address
    match ipv4 source address
    match ipv4 protocol
    match ipv4 tos
    collect counter bytes
    collect counter packets
    collect timestamp sys-uptime last
    collect timestamp sys-uptime first
```

```
collect ipv4 destination mask
collect ipv4 source mask
collect routing destination as
collect routing source as
collect transport tcp flags
collect routing next-hop address ipv4
collect interface output
```

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

Table 16: show flow record netflow-original Field Descriptions

Field	Description
Description	Description that you configured for the record, or the default description "User defined."
No. of users	Number of monitors in the configuration that use the flow record.
Total field space	Number of bytes required to store these fields for one flow.
Fields	The fields that are included in this record. For more information about the fields, refer to the **match** and **collect** commands.

Related Commands

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

show platform flow

To display information for Flexible NetFlow platform parameters. use the **showplatformflow**command in privileged EXEC mode.

show platform flow [{**aging** | {**export** | **usage** | **table-contention** {**aggregate** | **detailed** | **summary**}} [{*instancemodule*}] | {**ip** | **ipv6**} [{*countdestinationinstancemodulemulticastprotocolsource*}] | {**layer2** | **mpls**} [{*countinstancemodule*}]}]

Syntax Description

aging	(Optional) Displays the Flexible NetFlow parameter aging information.
export	(Optional) Displays the Flexible NetFlow parameter export information.
usage	(Optional) Displays the Flexible NetFlow table usage information.
table-contention	(Optional) Displays the Flexible NetFlow table contention information.
aggregate	(Optional) Displays the Flexible NetFlow table contention aggregate information.
detailed	(Optional) Displays the Flexible NetFlow table contention detailed information.
summary	(Optional) Displays theFlexible NetFlow table contention summary information.
ip	(Optional) Displays the Flexible NetFlow IP entry information.
ipv6	(Optional) Displays the Flexible NetFlow IPv6 entry information.
count	Total number of entries.
destination	(Optional) Information on entries with destination address.
instance	(Optional) Platform instance information.
module	(Optional) Platform module information.
multicast	(Optional) Flexible NetFlow multicast entry information.
protocol	(Optional) Flexible NetFlow Layer 4 protocol information.
source	(Optional) Information on entries with source address.
layer2	(Optional) Displays the Flexible NetFlow Layer 2 entry information.
mpls	(Optional) Displays the Flexible NetFlow MPLS entry information.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(50)SY	This command was introduced.

Examples

The following example displays Flexible NetFlow parameter export information:

```
Router# show platform flow export
Yielding NDE is enabled.
Supervisor CPU threshold = 25
Linecard CPU threshold   = 25

Module  3:
----------
No of flows read and exported = 0
No of flows discarded        = 0
No of capture+purge requests  = 1695104
No of purge-only requests     = 19

Module  5:
----------
No of flows read and exported = 0
No of flows discarded        = 0
No of capture+purge requests  = 1695158
No of purge-only requests     = 0
lionel#
```

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

Table 17: show platform flow export Field Descriptions

Field	Description
Supervisor CPU threshold	The platform (supervisor) CPU utilization threshold (in percent) up to which NetFlow export is permitted. The number and complexity of flow records to be exported is the prime cause of CPU use in NetFlow. The CPU Friendly NetFlow Export feature (also known as Yielding NetFlow Data Export, or Yielding NDE) monitors CPU use for both the supervisor and line cards according to user-configured thresholds and dynamically adjusts the rate of export as needed.
Linecard CPU threshold	The line-card CPU utilization threshold (in percent) up to which NetFlow export is permitted. The number and complexity of flow records to be exported is the prime cause of CPU use in NetFlow. The CPU Friendly NetFlow Export feature (also known as Yielding NetFlow Data Export, or Yielding NDE) monitors CPU use for both the supervisor and line cards according to user-configured thresholds and dynamically adjusts the rate of export as needed.
No of flows read and exported	Number of Flexible NetFlow flows processed and exported.
No of flows discarded	Number of Flexible NetFlow flows discarded.
No of capture+purge requests	Number of Flexible NetFlow flow capture and purge requests.
No of purge-only requests	Number of Flexible NetFlow flow purge requests.

Related Commands

Command	Description
flow hardware	Configures Flexible NetFlow hardware parameters.
flow platform	Configures Flexible NetFlow platform parameters.

show sampler

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

show sampler [[**name**] *sampler-name*]

Syntax Description

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

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Examples

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

```
Router# show sampler

Sampler SAMPLER-1:
  ID:           1
  Description:   User defined
  Type:          random
  Rate:          1 out of 3
  Samples:       189
  Requests:      23243
  Users (2):
    flow monitor FLOW-MONITOR-1 (ip,Et0/0,Input) 65 out of 10786
    flow monitor FLOW-MONITOR-2 (ipv6,Et0/0, Input) 124 out of 12457
Sampler sampler-2:
  ID:           2
  Description:   User defined
  Type:          deterministic
  Rate:          1 out of 100
```

```
Samples:          1
Requests:       124
Users (1):
   flow monitor FLOW-MONITOR-1 (ip,Et0/0,Input) 1 out of 124
```

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

Table 18: show sampler Field Descriptions

Field	Description
ID	ID number of the flow sampler. This is used to identify the sampler at the collector.
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. • deterministic—Deterministic mode of sampling. • random—Random mode of sampling.
Rate	Window size (for packet selection) that you configured for the flow sampler. Range: 2 to 32768.
Samples	Number of packets sampled since the flow sampler was configured or the router 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. Refer to the explanation of the "Requests" field in this table.
Requests	Number of times the flow sampler was queried to determine if the traffic needed to be sampled.
Users	Interfaces on which the flow sampler is configured.

Related Commands

Command	Description
clear sampler	Clears the flow sampler statistics.
debug sampler	Enables debugging output for flow samplers.
sampler	Creates a flow sampler.

source (Flexible NetFlow)

To configure the source IP address interface for all of the packets sent by a Flexible NetFlow flow exporter, use the **source** command in Flexible NetFlow 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

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

Command History	Release	Modification
	12.4(9)T	This command was introduced.
	12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
	12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
	12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.
	12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
	Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines

The benefits of using a consistent IP source address for the datagrams that 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 router 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 router to the destination system and you do not specify the source interface from which the source IP address is to be obtained, the router 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 router, but with different source IP addresses. When the destination system receives Flexible NetFlow datagrams from the same router with different source IP addresses, the destination system treats the Flexible NetFlow datagrams as if they were being sent from different routers. To avoid having the

destination system treat the Flexible NetFlow datagrams as if they were being sent from different routers, you must configure the destination system to aggregate the Flexible NetFlow datagrams it receives from all of the possible source IP addresses in the router into a single Flexible NetFlow flow.

• If your router 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 router 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.

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

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

Related Commands

Command	Description
flow exporter	Creates a flow exporter.

statistics packet

To collect protocol distribution statistics and size distribution statistics for a Flexible NetFlow flow monitor, use the **statisticspacket** command in Flexible NetFlow flow monitor configuration mode. To disable collecting protocol distribution statistics and size distribution statistics for a Flexible NetFlow flow monitor, use the **no** form of this command.

statistics packet {**protocol** | **size**}
no statistics packet {**protocol** | **size**}

Syntax Description

protocol	Collects packet protocol distribution statistics.
size	Collects packet size distribution statistic.

Command Default

The collection of protocol distribution statistics and size distribution statistics for a Flexible NetFlow flow monitor is not enabled by default.

Command Modes

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

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	Support for this command was added for Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE for the Cisco 7300 Network Processing Engine (NPE) series routers.
Cisco IOS XE 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.

Examples

The following example enables the collection of protocol distribution statistics for flow monitors:

```
Router(config)# flow monitor FLOW-MONITOR-1
Router(config-flow-monitor)# statistics packet protocol
```

The following example enables the collection of size distribution statistics for flow monitors:

```
Router(config)# flow monitor FLOW-MONITOR-1
Router(config-flow-monitor)# statistics packet size
```

Related Commands

Command	Description
flow monitor	Creates a flow monitor.

template data timeout

To configure the template resend timeout for a flow exporter, use the **template data timeout** command in Flexible NetFlow 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

Syntax Description

seconds	Configures resending of templates based on the timeout value in seconds, that you enter. Range: 1 to 86400. Default: 600.

Command Default

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

Command Modes

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

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
Cisco IOS XE Release 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
15.1(3)T	This command was modified. Support for the Cisco Performance Monitor was added.
12.2(58)SE	This command was modified. Support for the Cisco Performance Monitor was added.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor.

Examples

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

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

```
Router(config-flow-exporter)# template data timeout 1000
```

Related Commands

Command	Description
flow exporter	Creates a flow exporter.

transport (Flexible NetFlow)

To configure the transport protocol for a flow exporter for Flexible NetFlow or Performance Monitor, use the **transport** command in Flexible NetFlow 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

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

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

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
Cisco IOS XE Release 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
15.1(3)T	This command was modified. Support for the Cisco Performance Monitor was added.
12.2(58)SE	This command was modified. Support for the Cisco Performance Monitor was added.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines
This command can be used with both Flexible NetFlow and Performance Monitor.

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

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

Related Commands

Command	Description
flow exporter	Creates a flow exporter.

ttl (Flexible NetFlow)

To configure the time-to-live (TTL) value for a flow exporter for Flexible NetFlow or Performance Monitor, use the **ttl** command in Flexible NetFlow flow exporter configuration mode. To remove the TTL value for a flow exporter, use the **no** form of this command.

ttl *ttl*
no ttl

Syntax Description

ttl	Time-to-live (TTL) value for exported datagrams. Range: 1 to 255. Default: 255.

Command Default

Flow exporters use a TTL of 255.

Command Modes

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

Command History

Release	Modification
12.4(9)T	This command was introduced.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.0(33)S	This command was modified. Support for this command was implemented on the Cisco 12000 series routers.
12.2(33)SRC	This command was modified. Support for this command was implemented on the Cisco 7200 series routers.
12.2(33)SRE	This command was modified. Support for this command was implemented on the Cisco 7300 Network Processing Engine (NPE) series routers.
Cisco IOS XE Release 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
15.1(3)T	This command was modified. Support for the Cisco Performance Monitor was added.
12.2(58)SE	This command was modified. Support for the Cisco Performance Monitor was added.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
Cisco IOS XE Release 3.2SE	This command was integrated into Cisco IOS XE Release 3.2SE.

Usage Guidelines

This command can be used with both Flexible NetFlow and Performance Monitor.

Examples

The following example specifies a TTL of 15:

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

Related Commands

Command	Description
flow exporter	Creates a flow exporter.