Cisco Performance Monitor Commands

action (policy react and policy inline react)

To configure which applications which will receive an alarm or notification, use the **action** command in policy react configuration mode and policy inline react configuration mode. To disable the sending alarms or notifications, use the **no** form of this command.

action {**syslog** | **snmp**}

no action {**syslog** | **snmp**}

Syntax Description

syslog	Sends an alarm or notification to the syslog.
snmp	Sends an alarm or notification to the SNMP MIB variables.

Command Default

Information is saved to syslog.

Command Modes

Policy react configuration (config-pmap-c-react)
Policy inline react configuration (config-spolicy-inline-react)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

You can configure multiple action commands to allow more than one recipients to receive an alarm or notification.

Examples

The following example shows how to specify that SNMP MIB variables will receive an alarm or notification, while configuring a policy-map:

```
Router(config)# policy-map type performance-monitor policy-4
Router(config-pmap)# class PM-CLASS-4
Router(config-pmap-c)# react 2000 rtp-jitter-average
Router(config-pmap-c-react)# action snmp
```

The following example shows how to specify that SNMP MIB variables will receive an alarm or notification, while associating a service-policy with an interface:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# react 2000 rtp-jitter-average
Router(config-spolicy-inline-react)# action snmp
```

Related Commands

Command	Description
policy-map type performance-monitor	Creates a policy for Performance Monitor.
service-policy type performance-monitor	Associates a policy with an interface.

alarm severity (policy react and policy inline react)

To configure the severity of alarms sent for a Performance Monitor policy, use the **alarm severity** command in policy react configuration mode and policy inline react configuration mode. To return to the default and send all alarms, use the **no** form of this command.

alarm severity {**alert** | **critical** | **emergency** | **error** | **info**}

no alarm severity {**alert** | **critical** | **emergency** | **error** | **info**}

Syntax Description

alert	Sends only alerts.
critical	Sends only critical alarms.
emergency	Sends only emergency alarms.
error	Sends only errors.
info	Sends only informational messages.

Command Default

Alarm severity is set to info.

Command Modes

Policy react configuration (config-pmap-c-react)
Policy inline react configuration (config-spolicy-inline-react)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

The definition of the alarms types are listed below in order of severity:

- Emergency—System unusable
- Alert—Immediate action needed
- Critical—Critical condition
- Error—Error condition

Examples

The following example shows how to specify that only emergency alarms will be sent, while configuring a policy-map:

```
Router(config)# policy-map type performance-monitor policy-4
Router(config-pmap)# class PM-CLASS-4
Router(config-pmap-c)# react 2000 rtp-jitter-average
Router(config-pmap-c-react)# alarm severity emergency
```

The following example shows how to specify that only emergency alarms will be sent, while associating a service-policy with an interface:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# react 2000 rtp-jitter-average
Router(config-spolicy-inline-react)# alarm severity emergency
```

Related Commands

Command	Description
policy-map type performance-monitor	Creates a policy for Performance Monitor.
service-policy type performance-monitor	Associates a policy with an interface.

alarm type (policy react and policy inline react)

To configure the types of alarms sent for a Performance Monitor policy, use the **alarm type** command in policy react configuration mode and policy inline react configuration mode. To return to the default and send all alarms, use the **no** form of this command.

alarm type {**discrete** | **grouped** {**count** *number* | **percent** *number*}

no alarm type {**discrete** | **grouped** {**count** *number* | **percent** *number*}

Syntax Description

discrete	Sends only individual alarms.
grouped	Sends only grouped alarms.
count *number*	Send alarms only when the count of the monitored event is above the specified number
percent *number*	Send alarms only when percentage of the monitored event is above the specified number.

Command Default

Alarm type is set to discrete.

Command Modes

Policy react configuration (config-pmap-c-react)
Policy inline react configuration (config-spolicy-inline-react)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

The monitored event is specified by the **react** command. You can group alarms by whether they exceed a specified percentage or count.

Examples

The following example shows how to specify that only percentage type alarms will be sent, while configuring a policy-map:

```
Router(config)# policy-map type performance-monitor policy-4
Router(config-pmap)# class PM-CLASS-4
Router(config-pmap-c)# react 2000 rtp-jitter-average
Router(config-pmap-c-react)# alarm type percent 80
```

The following example shows how to specify that only percentage type alarms will be sent, while associating a service-policy with an interface:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# react 2000 rtp-jitter-average
Router(config-spolicy-inline-react)# alarm type percent 80
```

Related Commands

Command	Description
policy-map type performance-monitor	Creates a policy for Performance Monitor.
service-policy type performance-monitor	Associates a policy with an interface.

class-map

To create a class map to be used for matching packets to a specified class, use the **class-map** command in global configuration mode. To remove an existing class map from the router, use the **no** form of this command. The **class-map** command enters class-map configuration mode in which you can enter one of the **match** commands to configure the match criteria for this class.

Cisco 2600, 3660, 3845, 6500, 7200, 7401, and 7500 Series Routers

class-map [**type** {**stack** | **access-control** | **port-filter** | **queue-threshold** | **logging** *log-class*}] [**match-all** | **match-any**] *class-map-name*

no class-map [**type** {**stack** | **access-control** | **port-filter** | **queue-threshold** | **logging** *log-class*}] [**match-all** | **match-any**] *class-map-name*

Cisco 7600 Series Routers

class-map *class-map-name* [**match-all** | **match-any**]

no class-map *class-map-name* [**match-all** | **match-any**]

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

class-map *class-map-name*

no class-map *class-map-name*

Syntax Description

type stack	(Optional) Enables flexible packet matching (FPM) functionality to determine the correct protocol stack to examine. If the appropriate protocol header description files (PHDFs) have been loaded onto the router (via the **load protocol** command), a stack of protocol headers can be defined so that the filter can determine which headers are present and in what order.
type access-control	(Optional) Determines the exact pattern to look for in the protocol stack of interest. **Note** You must specify a stack class map (via the **type stack** keywords) before you can specify an access-control class map (via the **type access-control** keywords).
type port-filter	(Optional) Creates a port-filter class map that enables the TCP/UDP port policing of control plane packets. When enabled, it provides filtering of traffic that is destined to specific ports on the control-plane host subinterface.
type queue-threshold	(Optional) Enables queue thresholding that limits the total number of packets for a specified protocol that are allowed in the control plane IP input queue. This feature applies only to the control-plane host subinterface.
type logging *log-class*	(Optional) Enables logging of packet traffic on the control plane. The *log-class* is the name of the log class.

match-all	(Optional) Determines how packets are evaluated when multiple match criteria exist. Matches statements under this class map based on the logical AND function. One statement and another are accepted. If you do not specify the **match-all** or **match-any** keyword, the default keyword is **match-all**.
match-any	(Optional) Determines how packets are evaluated when multiple match criteria exist. Matches statements under this class map based on the logical OR function. One statement or another is accepted. If you do not specify the **match-any** or **match-all** keyword, the default keyword is **match-all**.
class-map-name	Name of the class for the class map. The class name is used for both the class map and to configure a policy for the class in the policy map.

Command Default

No class map is configured by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.0(5)T	This command was introduced.
12.0(5)XE	This command was integrated into Cisco IOS Release 12.0(5)XE.
12.0(7)S	This command was integrated into Cisco IOS Release 12.0(7)S.
12.1(1)E	This command was integrated into Cisco IOS Release 12.1(1)E.
12.2(14)SX	This command was integrated into Cisco IOS Release 12.2(14)SX and implemented on the Cisco 7600 series routers.
12.2(17d)SXB	This command was integrated into Cisco IOS Release 12.2(17d)SXB and implemented on the Cisco 7600 series routers.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.4(4)T	This command was modified. The **type stack** and **type access-control** keywords were added to support FPM. The **type port-filter** and **type queue-threshold** keywords were added to support Control Plane Protection.
12.4(6)T	This command was modified. The **type logging** keyword was added to support control plane packet logging.
12.2(18)ZY	This command was modified. The **type stack** and **type access-control** keywords were integrated into Cisco IOS Release 12.2(18)ZY on the Catalyst 6500 series of switches equipped with the Programmable Intelligent Services Accelerator (PISA)
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1 and implemented on the Cisco ASR 1000 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 *class-map-name* argument.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE for Cisco Performance Monitor with only the *class-map-name* argument.

Usage Guidelines

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

Only the *class-map-name* argument is available.

Cisco 2600, 3660, 3845, 6500, 7200, 7401, 7500, and ASR 1000 Series Routers

Use the **class-map** command to specify the class that you will create or modify to meet the class-map match criteria. This command enters class-map configuration mode in which you can enter one of the **match** commands to configure the match criteria for this class. Packets that arrive at either the input interface or the output interface (determined by how the **service-policy** command is configured) are checked against the match criteria configured for a class map to determine if the packets belong to that class.

When configuring a class map, you can use one or more **match** commands to specify match criteria. For example, you can use the **match access-group** command, the **match protocol** command, or the **match input-interface** command. The **match** commands vary according to the Cisco IOS release. For more information about match criteria and **match** commands, see the "Modular Quality of Service Command-Line Interface (CLI) (MQC)" chapter of the *Cisco IOS Quality of Service Solutions Configuration Guide*.

Cisco 7600 Series Routers

You apply the **class-map** command and its commands on a per-interface basis to define packet classification, marking, aggregate, and flow policing as part of a globally named service policy.

You can attach a service policy to an EtherChannel. Do not attach a service policy to a port that is a member of an EtherChannel.

After the router is in class-map configuration mode, the following configuration commands are available:

- **exit**—Used to exit from class-map configuration mode.
- **no**—Used to remove a match statement from a class map.
- **match**—Used to configure classification criteria. The following optional **match** commands are available:
  - **access-group** {*acl-index* | *acl-name*}
  - **ip** {**dscp** | **precedence**} *value1 value2 ... value8*

The following commands appear in the CLI help but are not supported on LAN interfaces or WAN interfaces on the Optical Service Modules (OSMs):

- **input-interface** {*interface-type interface-number* | **null** *number* | **vlan** *vlan-id*}
- **protocol** *link-type*
- **destination-address mac** *mac-address*
- **source-address mac** *mac-address*

OSMs are not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 32.

Policy Feature Card (PFC) QoS does not support the following commands:

- **input-interface** {*interface-type interface-number* | **null** *number* | **vlan** *vlan-id*}
- **protocol** *link-type*
- **destination-address mac** *mac-address*
- **source-address mac** *mac-address*
- **qos-group** *group-value*

If you enter these commands, PFC QoS does not detect the unsupported keywords until you attach a policy map to an interface. When you try to attach the policy map to an interface, you get an error message. For additional information, see the *Cisco 7600 Series Router Cisco IOS Software Configuration Guide* and the Cisco IOS command references.

After you have configured the class-map name and are in class-map configuration mode, you can enter the **match access-group** and **match ip dscp** commands. The syntax for these commands is as follows:

match [[**access-group** {*acl-index* | *acl-name*}] | [**ip** {**dscp** | **precedence**} *value*]]

See Table 8 for a syntax description of the **match** commands.

Table 8 match command Syntax Description

Optional command	Description
access-group *acl-index* | *acl-name*	(Optional) Specifies the access list index or access list names; valid access list index values are from 1 to 2699.
access-group *acl-name*	(Optional) Specifies the named access list.
ip dscp *value1 value2 ... value8*	(Optional) Specifies the IP DSCP values to match; valid values are from 0 to 63. You can enter up to 8 DSCP values and separate each value with one white space.
ip precedence *value1 value2 ... value8*	(Optional) Specifies the IP precedence values to match; valid values are from 0 to 7. You can enter up to 8 precedence values and separate each value with one white space.

Examples

The following example specifies class101 as the name of a class, and it defines a class map for this class. The class named class101 specifies policy for traffic that matches access control list 101.

```
Router(config)# class-map class101
Router(config-cmap)# match access-group 101
```

The following example shows how to define FPM traffic classes for slammer and UDP packets. The match criteria defined within the class maps are for slammer and UDP packets with an IP length not to exceed 404 bytes, UDP port 1434, and pattern 0x4011010 at 224 bytes from the start of the IP header.

```
Router(config)# load protocol disk2:ip.phdf
Router(config)# load protocol disk2:udp.phdf

Router(config)# class-map type stack match-all ip-udp
Router(config-cmap)# description "match UDP over IP packets"
Router(config-cmap)# match field ip protocol eq 0x11 next udp

Router(config)# class-map type access-control match-all slammer
Router(config-cmap)# description "match on slammer packets"
Router(config-cmap)# match field udp dest-port eq 0x59A
Router(config-cmap)# match field ip length eq 0x194
Router(config-cmap)# match start 13-start offset 224 size 4 eq 0x4011010
```

The following example shows how to configure a port-filter policy to drop all traffic that is destined to closed or "nonlistened" ports except SNMP.

```
Router(config)# class-map type port-filter pf-class
Router(config-cmap)# match not port udp 123
Router(config-cmap)# match closed-ports
Router(config-cmap)# exit
Router(config)# policy-map type port-filter pf-policy
```

```
Router(config-pmap)# class pf-class
Router(config-pmap-c)# drop
Router(config-pmap-c)# end
```

The following example shows how to configure a class map named ipp5, and enter a match statement for IP precedence 5:

```
Router(config)# class-map ipp5
Router(config-cmap)# match ip precedence 5
```

Related Commands

Command	Description
class (policy-map)	Specifies the name of the class whose policy you want to create or change, and the default class (commonly known as the class-default class) before you configure its policy.
class class-default	Specifies the default class for a service policy map.
match (**class-map**)	Configures the match criteria for a class map on the basis of port filter and/or protocol queue policies.
match access-group	Configures the match criteria for a class map on the basis of the specified ACL.
match input-interface	Configures a class map to use the specified input interface as a match criterion.
match ip dscp	Identifies one or more DSCP, AF, and CS values as a match criterion
match mpls experimental	Configures a class map to use the specified EXP field value as a match criterion.
match protocol	Configures the match criteria for a class map on the basis of the specified protocol.
policy-map	Creates or modifies a policy map that can be attached to one or more interfaces to specify a service policy.
service-policy	Attaches a policy map to an input interface or virtual circuit (VC) or to an output interface or VC to be used as the service policy for that interface or VC.
show class-map	Displays class-map information.
show policy-map interface	Displays the statistics and the configurations of the input and output policies that are attached to an interface.

clock-rate (policy RTP)

To configure the rate for the RTP packet time-stamp clock, use the **clock-rate** command in policy RTP configuration mode. To remove the configuration, use the **no** form of this command.

clock-rate {*type-number* | *type-name*} *rate*

no clock-rate

Syntax Description

type-number	An integer between 0 and 34. This value is compared with the payload type field in the RTP header. Values between 0 and 23 are reserved for audio streams, and values between 24 and 34 are reserved for video streams.
type-name	The name of the payload type field in the RTP header.
rate	Clock rate in Hz. The range is from 9600 to 124000.

Command Default

Clock rate is 90000.

Command Modes

policy RTP configuration (config-pmap-c-mrtp)
policy inline RTP configuration (config-spolicy-inline-mrtp)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

For more information about how the clock rate for RTP packet time-stamp clock is used to calculate the packet arrival latency, see RFC 3550, *RTP, A Transport Protocol for Real-Time Applications*. The clock rate has to be synchronized with the routers along the path of the flow. Because the clock rate can vary depending on the payload codec type, a keyword is provided to set the expected clock rate.

The available values for *type-name and type-number* are celb (25), cn (13), dvi4 (5) (8000 Hz as described in RFC 3551, *RTP Profile for Audio and Video Conferences with Minimal Control*), dvi4-2 (6) (8000 Hz as described in RFC 3551), dvi4-3 (16) (DVI4 Dipol 11025 Hz), dvi4-4 (17) DVI4 Dipol 22050 Hz), g722 (9), g723 (4), g728 (15), g729 (18), gsm (3), h261 (31), h263 (34), jpeg (26), l16 (11) (L16 channel 1), l16-2 (10) (L16 channel 2), lpc (7), mp2t (33), mpa (14), mpv (32), nv (28), pcma (8), pcmu (0), qcelp (12).

Examples

The following example shows how to set the rate for the RTP packet time-stamp clock,while configuring a policy-map:

```
Router(config)# policy-map type performance-monitor policy-4
Router(config-pmap)# class PM-CLASS-4
Router(config-pmap-c)# monitor metric rtp
Router(config-pmap-c-mrtp)# clock-rate 8 9600
```

The following example shows how to set the rate for the RTP packet time-stamp clock, while associating a service-policy with an interface:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# monitor metric rtp
Router(config-spolicy-inline-mrtp)# clock-rate 8 9600
```

Related Commands

Command	Description
policy-map type performance-monitor	Creates a policy for Performance Monitor.
service-policy type performance-monitor	Associates a policy with an interface.

collect application media

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

collect application media {**bytes** {**rate** | **counter** [**long**]} | **packets** {**rate** [**variation**] | **counter** [**long**]}| **events**}

no collect application media {**bytes** | **packets** | **events**}

Syntax Description

bytes rate	Configures the field that counts the rate of bytes collected, in Bps, for all flows, as a nonkey field.
bytes counter	Configures the field that counts the total number of bytes collected, as a nonkey field.
long	Configures the field for the long count (byte or packet) as a nonkey field.
packets rate	Configures the field that counts the total number of application media packets collected, per second, for all flows, as a nonkey field.
variation	Configures the field for the variation in the rate application media packets collected, for all flows, as a nonkey field.
packets counter	Configures the filed that counts the total number of application media packets collected, for all flows, as a nonkey field.
events	Configures the field that indicates whether one of the media application thresholds configured for the flow was crossed at least once in the monitoring interval, field as a nonkey field.

Command Default

The application media field is not configured as a nonkey field for a user-defined flow record.

Command Modes

flow record configuration (config-flow-record)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

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 application media packet field as a nonkey field:

```
Router(config)# flow record type performance-monitor PM-RECORD-4
Router(config-flow-record)# collect application media packets
```

Related Commands

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

collect counter

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

collect counter {**bytes** [**long** | **rate**] | **packets** [**dropped** [**long**] | **long**]}

no collect counter {**bytes** [**long** | **rate**] | **packets** [**dropped** [**long**] | **long**]}

Syntax Description

bytes	Configures the byte counter field as a nonkey field.
long	Configures the counter for the number of long bytes or packets as a nonkey field.
rate	Configures the byte rate counter as a nonkey field.
packets	Configures the packet counter as a nonkey field.
dropped	Configures the dropped packet counter as a nonkey field.

Command Default

The counter fields are not configured as a nonkey field for a user-defined flow record.

Command Modes

flow record configuration (config-flow-record)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

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 dropped packet counter field as a nonkey field:

```
Router(config)# flow record type performance-monitor PM-RECORD-4
Router(config-flow-record)# collect counter packets dropped
```

Related Commands

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

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 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.

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**}

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.

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 **flow record type performance-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 inpu
```

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 **collect ipv4** 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.

Release	Modification
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 **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 **collect ipv4** command are documented as separate commands. All of the keywords for the **collect ipv4** command that are documented separately start with **collect ipv4**. 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 **collect ipv4 ttl** 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 **flow record type performance-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
```

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 destination

To configure the IPv4 destination address as a nonkey field for a flow record, use the **collect ipv4 destination** 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*]}

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.
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.

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 **flow record type performance-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 source

To configure the IPv4 source address as a nonkey field for a flow record, use the **collect ipv4 source** 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*]}

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.
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.

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 **flow record type performance-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 ttl

To configure the IPv4 time-to-live (TTL) field as a nonkey field for a flow record, use the **collect ipv4 ttl** 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 **flow record type performance-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 **collect ipv4 ttl** 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 monitor event

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

collect monitor event

no collect monitor event

Syntax Description

This command has no arguments or keywords.

Command Default

The monitor event field is not configured as a nonkey field for a user-defined flow record.

Command Modes

flow record configuration (config-flow-record)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

Monitor events are recorded using two bits. Bit 1 is not used. Bit 2 indicates that no media application packets were seen, in other words, a Media Stop Event occured.

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 monitor event field as a nonkey field:

```
Router(config)# flow record type performance-monitor PM-RECORD-4
Router(config-flow-record)# collect monitor event
```

Related Commands

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

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**}

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

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**]

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.
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.

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** keywordwas 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 will provide the expected next network as opposed to the destination network.

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 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 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.

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
```

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 timestamp interval

To configure the start time of the monitoring interval as a nonkey field for a flow record, use the **collect timestamp interval** command in flow record configuration mode. To disable the use of the start time of the monitoring interval as a nonkey field for a flow record, use the **no** form of this command.

collect timestamp interval

no collect timestamp interval

Syntax Description

This command has no arguments or keywords.

Command Default

The start time of the monitoring interval is not configured as a nonkey field.

Command Modes

flow record configuration (config-flow-record)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

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 start time of the monitoring interval as a nonkey field:

```
Router(config)# flow record type performance-monitor PM-RECORD-4
Router(config-flow-record)# collect timestamp interval
```

Related Commands

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

collect transport event packet-loss counter

To configure the event packet-loss counter field as a nonkey field for a flow record, use the **collect transport event packet-loss counter** command in flow record configuration mode. To disable the use of the event packet-loss counter field as a nonkey field for a flow record, use the **no** form of this command.

collect transport event packet-loss counter

no collect transport event packet-loss counter

Syntax Description

This command has no arguments or keywords.

Command Default

The event packet-loss counter field is not configured as a nonkey field for a user-defined flow record.

Command Modes

flow record configuration (config-flow-record)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

The event packet-loss counter is incremented when a lost RTP packet is detected. However, the counter is also incremented when a reorder occurs, in other words, when packets are received out of order.

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 event packet-loss counter field as a nonkey field:

```
Router(config)# flow record type performance-monitor PM-RECORD-4
Router(config-flow-record)# collect transport event packet-loss counter
```

Related Commands

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

collect transport packets

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

collect transport packets{**lost counter** | **lost rate** | **expected counter** | **round-trip-time**}

no collect transport packets {**lost counter** | **lost rate** | **expected counter** | **round-trip-time**}

Syntax Description

lost counter	Configures the field that counts the number of lost packets as a nonkey field.
lost rate	Configures the field that counts the rate of lost packets as a nonkey field.
expected counter	Configures the field that counts the number of expected packets as a nonkey field.
round-trip-time	Configures the field for the packet round-trip-time as a nonkey field.

Command Default

The packet fields are not configured as a nonkey field for a user-defined flow record.

Command Modes

flow record configuration (config-flow-record)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

You can retrieve different transport packet counters for RTP and TCP. The following transport packet counters as available:

- rtp lost counter
- rtp lost rate
- rtp expected counter
- tcp transport round-trip-time

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 field that counts the number of lost packets as a nonkey field:

```
Router(config)# flow record type performance-monitor PM-RECORD-4
Router(config-flow-record)# collect transport packets lost counter
```

Related Commands

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

collect transport rtp jitter

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

collect transport rtp jitter {**mean** | **maximum** | **minimum**}

no collect transport rtp jitter {**mean** | **maximum** | **minimum**}

Syntax Description

jitter	Configures the RTP jitter field as a nonkey field.
mean	Configures the mean value of the RTP jitter field as a nonkey field.
maximum	Configures the maximun value of the RTP jitter field as a nonkey field.
minimum	Configures the minumum value of the RTP jitter field as a nonkey field.

Command Default

The RTP jitter field is not configured as a nonkey field for a user-defined flow record.

Command Modes

flow record configuration (config-flow-record)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

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 RTP jitter field as a nonkey field:

```
Router(config)# flow record type performance-monitor PM-RECORD-4
Router(config-flow-record)# collect transport rtp jitter
```

Related Commands

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

debug performance monitor

To enable debugging for performance monitor, use the **debug performance monitor** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

debug performance monitor {**database** | **dynamic** | **event** | **export** | **flow-monitor** | **metering** | **provision** | **sibling** | **snmp** | **tca** | **timer**}

no debug performance monitor {**database** | **dynamic** | **event** | **export** | **flow-monitor** | **metering** | **provision** | **sibling** | **snmp** | **tca** | **timer**}

Syntax Description

database	Enables debugging for the flow database.
dynamic	Enables debugging for dynamic monitoring.
event	Enables debugging for performance events.
export	Enables debugging for exporting.
flow-monitor	Enables debugging for flow monitors.
metering	Enables debugging for the metering layer.
provision	Enables debugging for provisioning.
sibling	Enables debugging for sibling management.
snmp	Enables debugging for SNMP.
tca	Enables debugging for Threshold Crossing Alarms (TCA).
timer	Enables debugging for timers.

Command Default

Debugging for performance monitor is disabled.

Command Modes

Privileged EXEC

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Examples

The following example shows how to enable debugging for dynamic monitoring:

```
Router# debug performance monitor dynamic
```

Related Commands

Command	Description
flow exporter	Creates a flow exporter.
flow monitor type performance-monitor	Creates a flow monitor.

description (Performance Monitor)

To configure a description for a flow exporter, flow record, flow monitor, or policy map use the **description** command in the appropriate configuration mode. To remove the description, use the **no** form of this command.

description *description*

no description

Syntax Description

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

Command Default

No description is configured.

Command Modes

Flow exporter configuration (config-flow-exporter)
Flow record configuration (config-flow-record)
Flow monitor configuration (config-flow-monitor)
Policy configuration (config-pmap)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

The description command is meant solely as a comment to be put in the configuration to help you remember information about the flow exporter, flow record, flow monitor, or policy map, such as which packets are included within the policy map.

Examples

The following example shows how to configuration a description for a flow record:

```
Router(config)# flow record type performance-monitor
Router(config-flow-record)# description collect the number of IPV4 packet dropped
Router(config-flow-record)# match ipv4 protocol
Router(config-flow-record)# collect counter packets dropped
```

Related Commands

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

Command	Description
flow monitor type performance-monitor	Creates a flow monitor.
policy-map type performance-monitor	Creates a policy map.

destination

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

destination {{*ip-address* | *hostname*} | **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

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 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.
Cisco IOS XE Release 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
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

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

When you configure a hostname instead of the IP address for the device, the hostname is resolved immediately and the 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 flow exporter datagrams, use the **dscp** command in flow exporter configuration mode. To remove a DSCP value for flow exporter datagrams, use the **no** form of this command.

dscp *dscp*

no dscp

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

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 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.

Examples

The following example sets 22 as 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.

export-protocol

To configure the export protocol for a flow exporter, use the **export-protocol** command in flow exporter configuration mode. To restore the use of the default export protocol for a flow exporter, use the **no** form of this command.

export-protocol {**netflow-v5** | **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.

Command Default

NetFlow Version 9 export is used as the export protocol for a flow exporter.

Command Modes

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 integrated into Cisco IOS Release 12.2(33)SRE for 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 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

The NetFlow Version 5 export protocol is supported only for flow monitors that use the Flexible NetFlow predefined records.

Examples

The following example configures NetFlow Version 5 export as the export protocol for a Flexible NetFlow or Performance Monitor flow 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

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 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.
Cisco IOS XE Release 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
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 configuration mode and policy monitor configuration configuration mode.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE for Cisco Performance Monitor.

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.

Examples

The following example configures an exporter for a flow monitor:

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

The following example shows one of the ways to configure a flow exporter for Performance Monitor:

```
Router(config)# policy-map type performance-monitor policy-4
Router(config-pmap)# class class-4
Router(config-pmap-c)# flow monitor monitor-4
Router(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.

flow monitor type performance-monitor

To configure a flow monitor for Performance Monitor, use the **flow monitor type performance-monitor** command in global configuration mode. To remove flow monitor, use the **no** form of this command.

flow monitor type performance-monitor *monitor-name*

no flow monitor type performance-monitor *monitor-name*

Syntax Description

monitor-name	Specifies which flow monitor is being configured.

Command Modes

Global configuration (config)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

.Before you configure flow monitor, you should first configure a flow record and an optional flow exporter.

Examples

The following example shows how to configure a flow monitor:

```
Router(config)# flow monitor type performance-monitor PM-MONITOR-4
```

Related Commands

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

flow record type performance-monitor

To configure a flow record for Performance Monitor, use the **flow record type performance-monitor** command in global configuration mode. To remove the flow record, use the **no** form of this command.

flow record type performance-monitor *record-name*

no flow record type performance-monitor *record-name*

Syntax Description

record-name	Specifies which flow record is being configured.

Command Modes

Global configuration (config)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

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 **collect** command.

Examples

The following example shows how to configure a flow record:

```
Router(config)# flow record type performance-monitor PM-RECORD-4
```

Related Commands

Command	Description
flow monitor type performance-monitor	Creates a flow monitor.

flows

To configure the maximum number of flows for each Performance Monitor cache, use the **flows** command in monitor parameters configuration mode. To remove the configuration, use the **no** form of this command.

flows *number*

no flows *number*

Syntax Description

number	Specifies the number of flows to collect for the policy.

Command Default

Number of flows to collect is 8000.

Command Modes

Monitor parameters configuration (config-pmap-c-mparam)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Examples

The following example shows how to set the number of flows to collect for a Performance Monitor policy to four:

```
Router(config)# policy-map type performance-monitor PM-POLICY-4
Router(config-pamp)# class class-6
Router(config-pmap-c)# monitor parameters
Router(config-pmap-c-mparam)# flows 4
```

Related Commands

Command	Description
policy-map type performance-monitor	Creates a policy for Performance Monitor.

history (monitor parameters)

To configure the number of historical collections to keep for a Performance Monitor policy, use the **history** command in monitor parameters configuration mode. To remove the configuration, use the **no** form of this command.

history *number*

no history

Syntax Description

number	Specifies the number of historical collections to keep for the policy.

Command Default

Number of historical collections to keep is 10.

Command Modes

Monitor parameters configuration (config-pmap-c-mparam)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Examples

The following example shows how to set the number of historical collections to keep for a Performance Monitor policy to four:

```
Router(config)# policy-map type performance-monitor PM-POLICY-4
Router(config-pamp)# class class-6
Router(config-pmap-c)# monitor parameters
Router(config-pmap-c-mparam)# history 4
```

Related Commands

Command	Description
policy-map type performance-monitor	Creates a policy for Performance Monitor.

interval duration

To configure the duration of the collection interval for a Performance Monitor policy, use the **interval duration** command in monitor parameters configuration mode. To remove the configuration, use the **no** form of this command.

interval duration *duration*

no interval duration

Syntax Description

duration	Specifies the duration of the collection interval for the policy.

Command Default

Duration of the collection interval is 30 seconds.

Command Modes

Monitor parameters configuration (config-pmap-c-mparam)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Examples

The following example shows how to set the collection interval for a Performance Monitor policy to twenty:

```
Router(config)# policy-map type performance-monitor PM-POLICY-4
Router(config-pamp)# class class-6
Router(config-pmap-c)# monitor parameters
Router(config-pmap-c-mparam)# interval duration 20
```

Related Commands

Command	Description
policy-map type performance-monitor	Creates a policy for Performance Monitor.

match access-group

To configure the match criteria for a class map on the basis of the specified access control list (ACL), use the **match access-group** command in class-map configuration or policy inline configuration mode. To remove ACL match criteria from a class map, use the **no** form of this command.

match access-group {*access-group* | **name** *access-group-name*}

no match access-group *access-group*

Syntax Description

access-group	Numbered ACL whose contents are used as the match criteria against which packets are checked to determine if they belong to this class. An ACL number can be a number from 1 to 2699.
name *access-group-name*	Named ACL whose contents are used as the match criteria against which packets are checked to determine if they belong to this class. The name can be a maximum of 40 alphanumeric characters.

Command Default

No match criteria are configured.

Command Modes

Class-map configuration (config-cmap)
Policy inline configuration (config-if-spolicy-inline)

Command History

Release	Modification
12.0(5)T	This command was introduced.
12.0(5)XE	This command was integrated into Cisco IOS Release 12.0(5)XE.
12.0(7)S	This command was integrated into Cisco IOS Release 12.0(7)S.
12.0(17)SL	This command was modified. This command was enhanced to include matching on access lists on the Cisco 10000 series routers.
12.1(1)E	This command was integrated into Cisco IOS Release 12.1(1)E.
12.4(6)T	This command was modified. This command was enhanced to support Zone-Based Policy Firewall.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB	This command was integrated into Cisco IOS Release 12.2(31)SB.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
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 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.

For class-based weighted fair queueing (CBWFQ), you define traffic classes based on match criteria including ACLs, protocols, input interfaces, quality of service (QoS) labels, and EXP field values. Packets satisfying the match criteria for a class constitute the traffic for that class.

Note For Zone-Based Policy Firewall, this command is not applicable to CBWFQ.

The **match access-group** command specifies a numbered or named ACL whose contents are used as the match criteria against which packets are checked to determine if they belong to the class specified by the class map.

When packets are matched to an access group, a traffic rate is generated for these packets. In a zone-based firewall policy, only the first packet that creates a session matches the policy. Subsequent packets in this flow do not match the filters in the configured policy, but instead match the session directly. The statistics related to subsequent packets are shown as part of the inspect action.

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

You must first enter the s**ervice-policy type performance-monitor inline** command.

Supported Platforms Other than Cisco 10000 Series Routers

To use the **match access-group** command, you must first enter the **class-map** command to specify the name of the class whose match criteria you want to establish. After you identify the class, you can use one of the following commands to configure its match criteria:

- **match access-group**
- **match input-interface**
- **match mpls experimental**
- **match protocol**

Note Zone-Based Policy Firewall supports only the **match access-group**, **match protocol**, and **match class-map** commands.

If you specify more than one command in a class map, only the last command entered applies. The last command overrides the previously entered commands.

Note The **match access-group** command specifies the numbered access list against whose contents packets are checked to determine if they match the criteria specified in the class map. Access lists configured with the optional **log** keyword of the **access-list** command are not supported when you configure match criteria. For more information about the **access-list** command, refer to the *Cisco IOS IP Application Services Command Reference*.

Cisco 10000 Series Routers

To use the **match access-group** command, you must first enter the **class-map** command to specify the name of the class whose match criteria you want to establish.

Note The **match access-group** command specifies the numbered access list against whose contents packets are checked to determine if they match the criteria specified in the class map. Access lists configured with the optional **log** keyword of the **access-list** command are not supported when you configure match criteria.

Examples

The following example specifies a class map named acl144 and configures the ACL numbered 144 to be used as the match criterion for that class:

```
Router(config)# class-map acl144
Router(config-cmap)# match access-group 144
```

The following example pertains to Zone-Based Policy Firewall. The example defines a class map named c1 and configures the ACL numbered 144 to be used as the match criterion for that class.

```
Router(config)# class-map type inspect match-all c1
Router(config-cmap)# match access-group 144
```

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

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 criteria specified the ACL numbered 144 will be monitored based on the parameters specified in the flow monitor configuration named **fm-2**

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-cmap)# match access-group 144
```

Related Commands

Command	Description
access-list (IP extended)	Defines an extended IP access list.
access-list (IP standard)	Defines a standard IP access list.
class-map	Creates a class map to be used for matching packets to a specified class.
service-policy type performance-monitor	Associates a Performance Monitor policy with an interface.
match input-interface	Configures a class map to use the specified input interface as a match criterion.
match mpls experimental	Configures a class map to use the specified EXP field value as a match criterion.
match protocol	Configures the match criteria for a class map on the basis of the specified protocol.

match any

To configure the match criteria for a class map to be successful match criteria for all packets, use the **match any** command in class-map configuration or policy inline configuration mode. To remove all criteria as successful match criteria, use the **no** form of this command.

match any

no match any

Syntax Description

This command has no arguments or keywords.

Command Default

No match criteria are specified.

Command Modes

Class-map configuration (config-cmap)
Policy inline configuration (config-if-spolicy-inline)

Command History

Release	Modification
12.0(5)XE	This command was introduced.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0(5)T.
12.1(1)E	This command was integrated into Cisco IOS Release 12.1(1)E.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB	This command was integrated into Cisco IOS Release 12.2(31)SB and implemented on the Cisco 10000 series routers.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
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 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.

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

You must first enter the s**ervice-policy type performance-monitor inline** command.

Examples

In the following configuration, all packets traversing Ethernet interface 1/1 will be policed based on the parameters specified in policy-map class configuration mode:

```
Router(config)# class-map matchany
Router(config-cmap)# match any
Router(config-cmap)# exit

Router(config)# policy-map policy1
Router(config-pmap)# class class4
Router(config-pmap-c)# police 8100 1500 2504 conform-action transmit exceed-action
set-qos-transmit 4
Router(config-pmap-c)# exit

Router(config)# interface ethernet1/1
Router(config-if)# service-policy output policy1
```

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

The following example shows how to use the policy inline configuration mode to configure a service policy for Performance Monitor. The policy specifies that all packets traversing Ethernet interface 0/0 will be matched and monitored based on the parameters specified in the flow monitor configuration named **fm-2**:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# match any
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.
service-policy type performance-monitor	Associates a Performance Monitor policy with an interface.
match input-interface	Configures a class map to use the specified input interface as a match criterion.
match protocol	Configures the match criteria for a class map on the basis of the specified protocol.

match cos

To match a packet on the basis of a Layer 2 class of service (CoS)/Inter-Switch Link (ISL) marking, use the **match cos** command in class-map configuration or policy inline configuration mode. To remove a specific Layer 2 CoS/ISL marking as a match criterion, use the **no** form of this command.

match cos *cos-value* [*cos-value* [*cos-value* [*cos-value*]]]

no match cos *cos-value* [*cos-value* [*cos-value* [*cos-value*]]]

Syntax Description

Supported Platforms Other Than the Cisco 10000 Series Routers	
cos-value	Specific IEEE 802.1Q/ISL CoS value. The *cos-value* is from 0 to 7; up to four CoS values, separated by a space, can be specified in one **match cos** statement.
Cisco 10000 Series Routers	
cos-value	Specific packet CoS bit value. Specifies that the packet CoS bit value must match the specified CoS value. The *cos-value* is from 0 to 7; up to four CoS values, separated by a space, can be specified in one **match cos** statement.

Command Default

Packets are not matched on the basis of a Layer 2 CoS/ISL marking.

Command Modes

Class-map configuration (config-cmap)
Policy inline configuration (config-if-spolicy-inline)

Command History

Release	Modification
12.1(5)T	This command was introduced.
12.0(25)S	This command was integrated into Cisco IOS Release 12.0(25)S.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB	This command was integrated into Cisco IOS Release 12.2(31)SB and implemented on the Cisco 10000 series routers.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
12.2(33)SRC	This command was integrated into Cisco IOS Release 12.2(33)SRC and support for the Cisco 7600 series routers was added.
12.4(15)T2	This command was integrated into Cisco IOS Release 12.4(15)T2.
12.2(33)SB	This command was integrated into Cisco IOS Release 12.2(33)SB and support for the Cisco 7300 series router was added.

Release	Modification
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 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.

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

You must first enter the s**ervice-policy type performance-monitor inline** command.

Examples

In the following example, the CoS values of 1, 2, and 3 are successful match criteria for the interface that contains the classification policy named cos:

```
Router(config)# class-map cos
Router(config-cmap)# match cos 1 2 3
```

In the following example, classes named voice and video-n-data are created to classify traffic based on the CoS values. QoS treatment is then given to the appropriate packets in the CoS-based-treatment policy map (in this case, the QoS treatment is priority 64 and bandwidth 512). The service policy configured in this example is attached to all packets leaving Fast Ethernet interface 0/0.1. The service policy can be attached to any interface that supports service policies.

```
Router(config)# class-map voice
Router(config-cmap)# match cos 7

Router(config)# class-map video-n-data
Router(config-cmap)# match cos 5

Router(config)# policy-map cos-based-treatment
Router(config-pmap)# class voice
Router(config-pmap-c)# priority 64
Router(config-pmap-c)# exit
Router(config-pmap)# class video-n-data
Router(config-pmap-c)# bandwidth 512
Router(config-pmap-c)# exit
Router(config-pmap)# exit

Router(config)# interface fastethernet0/0.1
Router(config-if)# service-policy output cos-based-treatment
```

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

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 criteria of a CoS value of 2 will be monitored based on the parameters specified in the flow monitor configuration named **fm-2**:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# match cos 2
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.
service-policy type performance-monitor	Associates a Performance Monitor policy with an interface.
policy-map	Creates or modifies a policy map that can be attached to one or more interfaces to specify a service policy.
service-policy	Attaches a policy map to an input interface or VC, or an output interface or VC, to be used as the service policy for that interface or VC.
set cos	Sets the Layer 2 CoS value of an outgoing packet.
show class-map	Displays all class maps and their matching criteria.

match destination-address mac

To use the destination MAC address as a match criterion, use the **match destination-address mac** command in class-map configuration or policy inline configuration mode. To remove a previously specified destination MAC address as a match criterion, use the **no** form of this command.

match destination-address mac *address*

no match destination-address mac *address*

Syntax Description

address	Destination MAC address to be used as a match criterion.

Command Default

No destination MAC address is specified.

Command Modes

Class-map configuration (config-cmap)
Policy inline configuration (config-if-spolicy-inline)

Command History

Release	Modification
12.0(5)XE	This command was introduced.
12.1(1)E	This command was integrated into Cisco IOS Release 12.1(1)E.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB	This command was integrated into Cisco IOS Release 12.2(31)SB and implemented on the Cisco 10000 series.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
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 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.

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

You must first enter the s**ervice-policy type performance-monitor inline** command.

Examples

The following example specifies a class map named macaddress and specifies the destination MAC address to be used as the match criterion for this class:

```
Router(config)# class-map macaddress
Router(config-cmap)# match destination-address mac 00:00:00:00:00:00
```

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

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 specified destination MAC address will be monitored based on the parameters specified in the flow monitor configuration named **fm-2**:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# match destination-address mac 00:00:00:00:00:00
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.
service-policy type performance-monitor	Associates a Performance Monitor policy with an interface.

match discard-class

To specify a discard class as a match criterion, use the **match discard-class** command in class-map configuration or policy inline configuration mode. To remove a previously specified discard class as a match criterion, use the **no** form of this command.

match discard-class *class-number*

no match discard-class *class-number*

Syntax Description

class-number	Number of the discard class being matched. Valid values are 0 to 7.

Command Default

Packets will not be classified as expected.

Command Modes

Class-map configuration (config-cmap)
Policy inline configuration (config-if-spolicy-inline)

Command History

Release	Modification
12.2(13)T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB	This command was integrated into Cisco IOS Release 12.2(31)SB and implemented on the Cisco 10000 series routers.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
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 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.

A discard-class value has no mathematical significance. For example, the discard-class value 2 is not greater than 1. The value simply indicates that a packet marked with discard-class 2 should be treated differently than a packet marked with discard-class 1.

Packets that match the specified discard-class value are treated differently from packets marked with other discard-class values. The discard-class is a matching criterion only, used in defining per hop behavior (PHB) for dropping traffic.

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

You must first enter the s**ervice-policy type performance-monitor inline** command.

Examples

The following example shows that packets in discard class 2 are matched:

```
Router(config)# class-map d-class-2
Router(config-cmap)# match discard-class 2
```

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

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 criteria specified by discard-class 2 will be monitored based on the parameters specified in the flow monitor configuration named **fm-2**:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# match discard-class 2
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.
service-policy type performance-monitor	Associates a Performance Monitor policy with an interface.
set discard-class	Marks a packet with a discard-class value.

match dscp

To identify one or more differentiated service code point (DSCP), Assured Forwarding (AF), and Certificate Server (CS) values as a match criterion, use the **match dscp** command in class-map configuration or policy inline configuration mode. To remove a specific DSCP value from a class map, use the **no** form of this command.

match [**ip**] **dscp** *dscp-value* [*dscp-value dscp-value dscp-value dscp-value dscp-value dscp-value dscp-value*]

no match [**ip**] **dscp** *dscp-value*

Syntax Description

ip	(Optional) Specifies that the match is for IPv4 packets only. If not used, the match is on both IPv4 and IPv6 packets. **Note** For the Cisco 10000 series routers, the **ip** keyword is required.
dscp-value	The DSCP value used to identify a DSCP value. For valid values, see the "Usage Guidelines."

Command Default

No match criteria are configured.
If you do not enter the **ip** keyword, matching occurs on both IPv4 and IPv6 packets.

Command Modes

Class-map configuration (config-cmap)
Policy inline configuration (config-if-spolicy-inline)

Command History

Release	Modification
12.2(13)T	This command was introduced. This command replaces the **match ip dscp** command.
12.0(28)S	This command was integrated into Cisco IOS Release 12.0(28)S for support in IPv6.
12.0(17)SL	This command was integrated into Cisco IOS Release 12.0(17)SL and implemented on the Cisco 10000 series routers.
12.2(31)SB	This command was integrated into Cisco IOS Release 12.2(31)SB.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1 and introduced on Cisco ASR 1000 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 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.

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

You must first enter the s**ervice-policy type performance-monitor inline** command.

DSCP Values

You must enter one or more differentiated service code point (DSCP) values. The command may include any combination of the following:

- Numbers (0 to 63) representing differentiated services code point values
- AF numbers (for example, af11) identifying specific AF DSCPs
- CS numbers (for example, cs1) identifying specific CS DSCPs
- **default**—Matches packets with the default DSCP.
- **ef**—Matches packets with EF DSCP.

For example, if you wanted the DCSP values of 0, 1, 2, 3, 4, 5, 6, or 7 (note that only one of the IP DSCP values must be a successful match criterion, not all of the specified DSCP values), enter the **match dscp 0 1 2 3 4 5 6 7** command.

This command is used by the class map to identify a specific DSCP value marking on a packet. In this context, *dscp-value* arguments are used as markings only and have no mathematical significance. For instance, the *dscp-value* of 2 is not greater than 1. The value simply indicates that a packet marked with the *dscp-value* of 2 is different than a packet marked with the *dscp-value* of 1. The treatment of these marked packets is defined by the user through the setting of Quality of Service (QoS) policies in policy-map class configuration mode.

Match Packets on DSCP Values

To match DSCP values for IPv6 packets only, the **match protocol ipv6** command must also be used. Without that command, the DSCP match defaults to match both IPv4 and IPv6 packets.

To match DSCP values for IPv4 packets only, use the **ip** keyword. Without the **ip** keyword the match occurs on both IPv4 and IPv6 packets. Alternatively, the **match protocol ip** command may be used with **match dscp** to classify only IPv4 packets.

After the DSCP bit is set, other QoS features can then operate on the bit settings.

The network can give priority (or some type of expedited handling) to marked traffic. Typically, you set the precedence value at the edge of the network (or administrative domain); data is then queued according to the precedence. Weighted fair queueing (WFQ) can speed up handling for high-precedence traffic at congestion points. Weighted Random Early Detection (WRED) can ensure that high-precedence traffic has lower loss rates than other traffic during times of congestion.

Cisco 10000 Series Routers

The Cisco 10000 series routers support DSCP matching of IPv4 packets only. You must include the **ip** keyword when specifying the DSCP values to use as match criterion.

You cannot use the **set ip dscp** command with the **set ip precedence** command to mark the same packet. DSCP and precedence values are mutually exclusive. A packet can have one value or the other, but not both.

Examples

The following example shows how to set multiple match criteria. In this case, two IP DSCP value and one AF value.

```
Router(config)# class-map map1
Router(config-cmap)# match dscp 1 2 af11
```

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

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 criteria specified by DSCP value 2 will be monitored based on the parameters specified in the flow monitor configuration named **fm-2**:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# match dscp 2
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.
service-policy type performance-monitor	Associates a Performance Monitor policy with an interface.
match protocol ip	Matches DSCP values for packets.
match protocol ipv6	Matches DSCP values for IPv6 packets.
policy-map	Creates or modifies a policy map that can be attached to one or more interfaces to specify a service policy.
service-policy	Attaches a policy map to an input interface or VC, or an output interface or VC, to be used as the service policy for that interface or VC.
set dscp	Marks the DSCP value for packets within a traffic class.
show class-map	Displays all class maps and their matching criteria.

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 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**}

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.

Command Default

The use of the flow direction and the flow sampler ID number as key fields for a user-defined flow record is not enabled by default.

Command Modes

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 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. Support was added for policy inline configuration mode.
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.

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 s**ervice-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
```

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

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 **fm-2**:

```
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.
service-policy type performance-monitor	Associates a Performance Monitor policy with an interface.
flow exporter	Creates a flow exporter.
flow record	Creates a flow record for Flexible NetFlow.

match fr-de

To match packets on the basis of the Frame Relay discard eligibility (DE) bit setting, use the **match fr-de** command in class-map configuration or policy inline configuration mode. To remove the match criteria, use the **no** form of this command.

match fr-de

no match fr-de

Syntax Description

This command has no arguments or keywords.

Command Default

Packets are not matched on the basis of the Frame Relay DE bit setting.

Command Modes

Class-map configuration (config-cmap)
Policy inline configuration (config-if-spolicy-inline)

Command History

Release	Modification
12.0(25)S	This command was introduced for the Cisco 7500 series router.
12.0(26)S	This command was integrated into Cisco IOS Release 12.0(26)S and implemented on the Cisco 7200 series router.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRC	This command was integrated into Cisco IOS Release 12.2(33)SRC.
12.4(15)T2	This command was integrated into Cisco IOS Release 12.4(15)T2.
12.2(33)SB	This command was integrated into Cisco IOS Release 12.2(33)SB and implemented on the Cisco 7300 series router.
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 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.

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

You must first enter the s**ervice-policy type performance-monitor inline** command.

Examples

The following example creates a class named match-fr-de and matches packets on the basis of the Frame Relay DE bit setting.

```
Router(config)# class-map match-fr-de
```

```
Router(config-cmap)# match fr-de
```

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

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 Frame Relay DE bit setting will be monitored based on the parameters specified in the flow monitor configuration named **fm-2**:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# match fr-de
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.
service-policy type performance-monitor	Associates a Performance Monitor policy with an interface.
set fr-de	Changes the DE bit setting in the address field of a Frame Relay frame to 1 for all traffic leaving an interface.

match fr-dlci

To specify the Frame Relay data-link connection identifier (DLCI) number as a match criterion in a class map, use the **match fr-dlci** command in class-map configuration or policy inline configuration mode. To remove a previously specified DLCI number as a match criterion, use the **no** form of this command.

match fr-dlci *dlci-number*

no match fr-dlci *dlci-number*

Syntax Description

dlci-number	Number of the DLCI associated with the packet.

Command Default

No DLCI number is specified.

Command Modes

Class-map configuration (config-cmap)
Policy inline configuration (config-if-spolicy-inline)

Command History

Release	Modification
12.2(13)T	This command was introduced.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
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 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.

This match criterion can be used in main interfaces and point-to-multipoint subinterfaces in Frame Relay networks, and it can also be used in hierarchical policy maps.

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

You must first enter the s**ervice-policy type performance-monitor inline** command.

Examples

In the following example a class map named “class1” has been created and the Frame Relay DLCI number of 500 has been specified as a match criterion. Packets matching this criterion are placed in class1.

```
Router(config)# class-map class1
Router(config-cmap)# match fr-dlci 500
```

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

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 Frame Relay DLCI number of 500 will be monitored based on the parameters specified in the flow monitor configuration named **fm-2**:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# match fr-dlci 500
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.
service-policy type performance-monitor	Associates a Performance Monitor policy with an interface.
show class-map	Displays all class maps and their matching criteria.
show policy-map interface	Displays the packet statistics of all classes that are configured for all service policies either on the specified interface or subinterface or on a specific PVC on the interface.

match input-interface

To configure a class map to use the specified input interface as a match criterion, use the **match input-interface** command in class-map configuration or policy inline configuration mode. To remove the input interface match criterion from a class map, use the **no** form of this command.

match input-interface *interface-name*

no match input-interface *interface-name*

Syntax Description

interface-name	Name of the input interface to be used as match criteria.

Command Default

No match criteria are specified.

Command Modes

Class-map configuration (config-cmap)
Policy inline configuration (config-if-spolicy-inline)

Command History

Release	Modification
12.0(5)T	This command was introduced.
12.0(5)XE	This command was integrated into Cisco IOS Release 12.0(5)XE.
12.0(7)S	This command was integrated into Cisco IOS Release 12.0(7)S.
12.0(17)SL	This command was enhanced to include matching on the input interface.
12.1(1)E	This command was integrated into Cisco IOS Release 12.1(1)E.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB	This command was integrated into Cisco IOS Release 12.2(31)SB and implemented on the Cisco 10000 series routers.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
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 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.

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

You must first enter the s**ervice-policy type performance-monitor inline** command.

Supported Platforms Other Than Cisco 10000 Series Routers

For class-based weighted fair queueing (CBWFQ), you define traffic classes based on match criteria including input interfaces, access control lists (ACLs), protocols, quality of service (QoS) labels, and experimental (EXP) field values. Packets satisfying the match criteria for a class constitute the traffic for that class.

The **match input-interface** command specifies the name of an input interface to be used as the match criterion against which packets are checked to determine if they belong to the class specified by the class map.

To use the **match input-interface** command, you must first enter the **class-map** command to specify the name of the class whose match criteria you want to establish. After you identify the class, you can use one of the following commands to configure its match criteria:

- **match access-group**
- **match input-interface**
- **match mpls experimental**
- **match protocol**

If you specify more than one command in a class map, only the last command entered applies. The last command overrides the previously entered commands.

Cisco 10000 Series Routers

For CBWFQ, you define traffic classes based on match criteria including input interfaces, ACLs, protocols, QoS labels, and EXP field values. Packets satisfying the match criteria for a class constitute the traffic for that class.

To use the **match input-interface** command, you must first enter the **class-map** command to specify the name of the class whose match criteria you want to establish.

Examples

The following example specifies a class map named ethernet1 and configures the input interface named ethernet1 to be used as the match criterion for this class:

```
Router(config)# class-map ethernet1
Router(config-cmap)# match input-interface ethernet1
```

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

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 criteria of the input interface named ethernet1 will be monitored based on the parameters specified in the flow monitor configuration named **fm-2**:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# match input-interface ethernet 1
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.
service-policy type performance-monitor	Associates a Performance Monitor policy with an interface.

Command	Description
match access-group	Configures the match criteria for a class map based on the specified ACL.
match mpls experimental	Configures a class map to use the specified EXP field value as a match criterion.
match protocol	Configures the match criteria for a class map on the basis of the specified protocol.

match ip dscp

The **match ip dscp** command is replaced by the **match dscp** command. See the **match dscp** command for more information.

match ip precedence

The **match ip precedence** command is replaced by the **match precedence** command. See the **match precedence** command for more information.

match ip rtp

To configure a class map to use the Real-Time Protocol (RTP) port as the match criterion, use the **match ip rtp** command in class-map configuration or policy inline configuration mode. To remove the RTP port match criterion, use the **no** form of this command.

match ip rtp *starting-port-number port-range*

no match ip rtp

Syntax Description

starting-port-number	The starting RTP port number. Values range from 2000 to 65535.
port-range	The RTP port number range. Values range from 0 to 16383.

Command Default

No match criteria are specified.

Command Modes

Class-map configuration (config-cmap)
Policy inline configuration (config-if-spolicy-inline)

Command History

Release	Modification
12.1(2)T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB	This command was integrated into Cisco IOS Release 12.2(31)SB and implemented on the Cisco 10000 series routers.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
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 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.

This command is used to match IP RTP packets that fall within the specified port range. It matches packets destined to all even User Datagram Port (UDP) port numbers in the range from the *starting port number* argument to the *starting port number* plus the *port range* argument.

Use of an RTP port range as the match criterion is particularly effective for applications that use RTP, such as voice or video.

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

You must first enter the s**ervice-policy type performance-monitor inline** command.

Examples

The following example specifies a class map named ethernet1 and configures the RTP port number 2024 and range 1000 to be used as the match criteria for this class:

```
Router(config)# class-map ethernet1
Router(config-cmap)# match ip rtp 2024 1000
```

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

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 criteria of RTP port number 2024 and range 1000 will be monitored based on the parameters specified in the flow monitor configuration named **fm-2**:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# match ip rtp 2024 1000
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.
service-policy type performance-monitor	Associates a Performance Monitor policy with an interface.
ip rtp priority	Reserves a strict priority queue for a set of RTP packet flows belonging to a range of UDP destination ports.
match access-group	Configures the match criteria for a class map based on the specified ACL number.

match ipv4

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

match ipv4 {**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

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.
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.

Release	Modification
15.1(3)T	This command was integrated into Cisco IOS Release 15.1(3)T for Cisco Performance Monitor with only the **protocol** keyword.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE for Cisco Performance Monitor with only the **protocol** 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.

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
```

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

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 for Flexible NetFlow.
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 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*]}

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

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 integrated into Cisco IOS Release 12.0(33)S and implemented on the Gigabit Switch Router (GSR).
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 without the **mask** keyword.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE for Cisco Performance Monitor without the **mask** 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

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
```

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

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

match ipv4 source

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

match ipv4 source {**address** | {{**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*]}

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

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 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 without the **mask** keyword.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE for Cisco Performance Monitor without the **mask** 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

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
```

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

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

match mpls experimental topmost

To match the experimental (EXP) value in the topmost label header, use the **match mpls experimental topmost** command in class-map configuration or policy inline configuration mode. To remove the EXP match criterion, use the **no** form of this command.

match mpls experimental topmost *number*

no match mpls experimental topmost *number*

Syntax Description

number	Multiprotocol Label Switching (MPLS) EXP field in the topmost label header. Valid values are 0 to 7.

Command Default

No EXP match criterion is configured for the topmost label header.

Command Modes

Class-map configuration (config-cmap)
Policy inline configuration (config-if-spolicy-inline)

Command History

Release	Modification
12.2(13)T	This command was introduced.
12.2(31)SB	This command was integrated into Cisco IOS Release 12.2(31)SB.
Cisco IOS XE Release 2.3	This command was integrated into Cisco IOS XE Release 2.3.
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 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.

You can enter this command on the input interfaces and the output interfaces. It will match only on MPLS packets.

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

You must first enter the s**ervice-policy type performance-monitor inline** command.

Examples

The following example shows that the EXP value 3 in the topmost label header is matched:

```
Router(config)# class-map mpls exp
Router(config-cmap)# match mpls experimental topmost 3
```

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

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 criteria of a EXP value of 3 in the topmost label header will be monitored based on the parameters specified in the flow monitor configuration named **fm-2**:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# match mpls experimental topmost 3
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.
service-policy type performance-monitor	Associates a Performance Monitor policy with an interface.
set mpls experimental topmost	Sets the MPLS EXP field value in the topmost MPLS label header at the input or output interfaces.

match not

To specify the single match criterion value to use as an unsuccessful match criterion, use the **match not** command in class-map configuration or policy inline configuration mode. To remove a previously specified source value to not use as a match criterion, use the **no** form of this command.

match not *match-criterion*

no match not *match-criterion*

Syntax Description

match-criterion	The match criterion value that is an unsuccessful match criterion. All other values of the specified match criterion will be considered successful match criteria.

Command Default

No unsuccessful match criterion is configured.

Command Modes

Class-map configuration (config-cmap)
Policy inline configuration (config-if-spolicy-inline)

Command History

Release	Modification
12.0(5)XE	This command was introduced.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0(5)T.
12.1(1)E	This command was integrated into Cisco IOS Release 12.1(1)E.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB	This command was integrated into Cisco IOS Release 12.2(31)SB and implemented on the Cisco 10000 series routers.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
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 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.

The **match not** command is used to specify a quality of service (QoS) policy value that is not used as a match criterion. When the **match not** command is used, all other values of that QoS policy become successful match criteria.

For instance, if the **match not qos-group 4** command is issued in QoS class-map configuration mode, the specified class will accept all QoS group values except 4 as successful match criteria.

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

You must first enter the s**ervice-policy type performance-monitor inline** command.

Examples

In the following traffic class, all protocols except IP are considered successful match criteria:

```
Router(config)# class-map noip
Router(config-cmap)# match not protocol ip
```

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

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 for all protocols except IP will be monitored based on the parameters specified in the flow monitor configuration named **fm-2**:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# match not protocol ip
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.
service-policy type performance-monitor	Associates a Performance Monitor policy with an interface.

match packet length (class-map)

To specify the Layer 3 packet length in the IP header as a match criterion in a class map, use the **match packet length** command in class-map configuration or policy inline configuration mode. To remove a previously specified Layer 3 packet length as a match criterion, use the **no** form of this command.

match packet length {**max** *maximum-length-value* [**min** *minimum-length-value*] | **min** *minimum-length-value* [**max** *maximum-length-value*]}

no match packet length {**max** *maximum-length-value* [**min** *minimum-length-value*] | **min** *minimum-length-value* [**max** *maximum-length-value*]}

Syntax Description

max	Indicates that a maximum value for the Layer 3 packet length is to be specified.
maximum-length-value	Maximum length value of the Layer 3 packet length, in bytes. The range is from 1 to 2000.
min	Indicates that a minimum value for the Layer 3 packet length is to be specified.
minimum-length-value	Minimum length value of the Layer 3 packet length, in bytes. The range is from 1 to 2000.

Command Default

The Layer 3 packet length in the IP header is not used as a match criterion.

Command Modes

Class-map configuration (config-cmap)
Policy inline configuration (config-if-spolicy-inline)

Command History

Release	Modification
12.2(13)T	This command was introduced.
12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
Cisco IOS XE Release 2.2	This command was integrated into Cisco IOS XE Release 2.2 and implemented on the Cisco ASR 1000 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 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.

This command considers only the Layer 3 packet length in the IP header. It does not consider the Layer 2 packet length in the IP header.

When using this command, you must at least specify the maximum or minimum value. However, you do have the option of entering both values.

If only the minimum value is specified, a packet with a Layer 3 length greater than the minimum is viewed as matching the criterion.

If only the maximum value is specified, a packet with a Layer 3 length less than the maximum is viewed as matching the criterion.

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

You must first enter the s**ervice-policy type performance-monitor inline** command.

Examples

In the following example a class map named "class 1" has been created, and the Layer 3 packet length has been specified as a match criterion. In this example, packets with a minimum Layer 3 packet length of 100 bytes and a maximum Layer 3 packet length of 300 bytes are viewed as meeting the match criteria.

```
Router(config)# class-map match-all class1
Router(config-cmap)# match packet length min 100 max 300
```

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

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 criteria of a minimum Layer 3 packet length of 100 bytes and a maximum Layer 3 packet length of 300 bytes will be monitored based on the parameters specified in the flow monitor configuration named **fm-2**:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# match packet length min 100 max 300
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.
service-policy type performance-monitor	Associates a Performance Monitor policy with an interface.
show class-map	Displays all class maps and their matching criteria.
show policy-map interface	Displays the packet statistics of all classes that are configured for all service policies either on the specified interface or subinterface or on a specific PVC on the interface.

match precedence

To identify IP precedence values to use as the match criterion, use the **match precedence** command in class-map configuration or policy inline configuration mode. To remove IP precedence values from a class map, use the **no** form of this command.

match [**ip**] **precedence** {*precedence-criteria1* | *precedence-criteria2* | *precedence-criteria3* | *precedence-criteria4*}

no match [**ip**] **precedence** {*precedence-criteria1* | *precedence-criteria2* | *precedence-criteria3* | *precedence-criteria4*}

Syntax Description

ip	(Optional) Specifies that the match is for IPv4 packets only. If not used, the match is on both IP and IPv6 packets. **Note** For the Cisco 10000 series routers, the **ip** keyword is required.
precedence-criteria1 *precedence-criteria2* *precedence-criteria3* *precedence-criteria4*	Identifies the precedence value. You can enter up to four different values, separated by a space. See the "Usage Guidelines" for valid values.

Command Default

No match criterion is configured.
If you do not enter the **ip** keyword, matching occurs on both IPv4 and IPv6 packets.

Command Modes

Class-map configuration (config-cmap)
Policy inline configuration (config-if-spolicy-inline)

Command History

Release	Modification
12.2(13)T	This command was introduced. This command replaces the **match ip precedence** command.
12.0(17)SL	This command was integrated into Cisco IOS Release 12.0(17)SL and implemented on the Cisco 10000 series routers.
12.0(28)S	This command was integrated into Cisco IOS Release 12.0(28)S for IPv6.
12.2(31)SB	This command was integrated into Cisco IOS Release 12.2(31)SB.
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 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.

You can enter up to four matching criteria, as number abbreviation (0 to 7) or criteria names (critical, flash, and so on), in a single match statement. For example, if you wanted the precedence values of 0, 1, 2, or 3 (note that only one of the precedence values must be a successful match criterion, not all of the specified precedence values), enter the **match ip precedence 0 1 2 3** command. The *precedence-criteria* numbers are not mathematically significant; that is, the *precedence-criteria* of 2 is not greater than 1. The way that these different packets are treated depends upon quality of service (QoS) policies, set in the policy-map configuration mode.

You can configure a QoS policy to include IP precedence marking for packets entering the network. Devices within your network can then use the newly marked IP precedence values to determine how to treat the packets. For example, class-based weighted random early detection (WRED) uses IP precedence values to determine the probability that a packet is dropped. You can also mark voice packets with a particular precedence. You can then configure low-latency queueing (LLQ) to place all packets of that precedence into the priority queue.

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

You must first enter the s**ervice-policy type performance-monitor inline** command.

Matching Precedence for IPv6 and IPv4 Packets on the Cisco 10000 and 7600 Series Routers

On the Cisco 7600 series and 10000 series routers, you set matching criteria based on precedence values for only IPv6 packets using the **match protocol** command with the **ipv6** keyword. Without that keyword, the precedence match defaults to match both IPv4 and IPv6 packets. You set matching criteria based on precedence values for IPv4 packets only, use the **ip** keyword. Without the **ip** keyword the match occurs on both IPv4 and IPv6 packets.

Precedence Values and Names

The following table lists all criteria conditions by value, name, binary value, and recommended use. You may enter up to four criteria, each separated by a space. Only one of the precedence values must be a successful match criterion. Table 9 lists the IP precedence values.

Table 9 IP Precedence Values

Precedence Value	Precedence Name	Binary Value	Recommended Use
0	routine	000	Default marking value
1	priority	001	Data applications
2	immediate	010	Data applications
3	flash	011	Call signaling
4	flash-override	100	Video conferencing and streaming video
5	critical	101	Voice
6	internet (control)	110	Network control traffic (such as routing, which is typically precedence 6)
7	network (control)	111	

Do not use IP precedence 6 or 7 to mark packets, unless you are marking control packets.

Examples

IPv4-Specific Traffic Match

The following example shows how to configure the service policy named priority50 and attach service policy priority50 to an interface, matching for IPv4 traffic only. In a network where both IPv4 and IPv6 are running, you might find it necessary to distinguish between the protocols for matching and traffic segregation. In this example, the class map named ipprec5 will evaluate all IPv4 packets entering Fast Ethernet interface 1/0/0 for a precedence value of 5. If the incoming IPv4 packet has been marked with the precedence value of 5, the packet will be treated as priority traffic and will be allocated with bandwidth of 50 kbps.

```
Router(config)# class-map ipprec5
Router(config-cmap)# match ip precedence 5
Router(config)# exit
Router(config)# policy-map priority50
Router(config-pmap)# class ipprec5
Router(config-pmap-c)# priority 50
Router(config-pmap-c)# exit
Router(config-pmap)# exit
Router(config)# interface fa1/0/0
Router(config-if)# service-policy input priority50
```

IPv6-Specific Traffic Match

The following example shows the same service policy matching on precedence for IPv6 traffic only. Notice that the **match protocol** command with the **ipv6** keyword precedes the **match precedence** command. The **match protocol** command is required to perform matches on IPv6 traffic alone.

```
Router(config)# class-map ipprec5
Router(config-cmap)# match protocol ipv6
Router(config-cmap)# match precedence 5
Router(config)# exit
Router(config)# policy-map priority50
Router(config-pmap)# class ipprec5
Router(config-pmap-c)# priority 50
Router(config-pmap-c)# exit
Router(config-pmap)# exit
Router(config)# interface fa1/0/0
Router(config-if)# service-policy input priority50
```

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

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 criteria of a match precedence of 4 will be monitored based on the parameters specified in the flow monitor configuration named **fm-2**:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# match precedence 4
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.
service-policy type performance-monitor	Associates a Performance Monitor policy with an interface.
match protocol	Configures the match criteria for a class map on the basis of a specified protocol.

Command	Description
policy-map	Creates or modifies a policy map that can be attached to one or more interfaces to specify a service policy.
service-policy	Attaches a policy map to an input interface or VC, or an output interface or VC, to be used as the service policy for that interface or VC.
set ip precedence	Sets the precedence value in the IP header.
show class-map	Displays all class maps and their matching criteria, or a specified class map and its matching criteria.

match protocol

To configure the match criterion for a class map on the basis of a specified protocol, use the **match protocol** command in class-map configuration or policy inline configuration mode. To remove the protocol-based match criterion from the class map, use the **no** form of this command.

match protocol *protocol-name*

no match protocol *protocol-name*

Syntax Description

protocol-name	Name of the protocol (for example, bgp) used as a matching criterion. See the "Usage Guidelines" for a list of protocols supported by most routers.

Command Default

No match criterion is configured.

Command Modes

Class-map configuration (config-cmap)
Policy inline configuration (config-if-spolicy-inline)

Command History

Release	Modification
12.0(5)T	This command was introduced.
12.0(5)XE	This command was integrated into Cisco IOS Release 12.0(5)XE.
12.0(7)S	This command was integrated into Cisco IOS Release 12.0(7)S.
12.1(1)E	This command was integrated into Cisco IOS Release 12.1(1)E.
12.1(13)E	This command was integrated into Cisco IOS Release 12.1(13)E and implemented on Catalyst 6000 family switches without FlexWAN modules.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T.
12.2(13)T	This command was modified to remove **apollo**, **vines**, and **xns** from the list of protocols used as matching criteria. These protocols were removed because Apollo Domain, Banyan VINES, and Xerox Network Systems (XNS) were removed in this release. The IPv6 protocol was added to support matching on IPv6 packets.
12.0(28)S	This command was integrated into Cisco IOS Release 12.0(28)S for IPv6.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.2(17a)SX1	This command was integrated into Cisco IOS Release 12.2(17a)SX1.
12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE and implemented on the Supervisor Engine 720.
12.4(6)T	This command was modified. The Napster protocol was removed because it is no longer supported.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2 and implemented on the Cisco 10000 series routers.

Release	Modification
12.2(18)ZY	This command was integrated into Cisco IOS Release 12.2(18)ZY. This command was modified to enhance Network-Based Application Recognition (NBAR) functionality on the Catalyst 6500 series switch that is equipped with the Supervisor 32/programmable intelligent services accelerator (PISA) engine.
12.4(15)XZ	This command was integrated into Cisco IOS Release 12.4(15)XZ.
12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T and implemented on the Cisco 1700, Cisco 1800, Cisco 2600, Cisco 2800, Cisco 3700, Cisco 3800, Cisco 7200, and Cisco 7300 series routers.
Cisco IOS XE Release 2.2	This command was integrated into Cisco IOS XE Release 2.2 and implemented on the Cisco ASR 1000 Series Routers.
Cisco IOS XE Release 3.1S	This command was modified. Support for more protocols was added.
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 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.

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

You must first enter the s**ervice-policy type performance-monitor inline** command.

Supported Platforms Other Than Cisco 7600 Routers and Cisco 10000 Series Routers

For class-based weighted fair queueing (CBWFQ), you define traffic classes based on match criteria protocols, access control lists (ACLs), input interfaces, quality of service (QoS) labels, and Experimental (EXP) field values. Packets satisfying the match criteria for a class constitute the traffic for that class.

The **match protocol** command specifies the name of a protocol to be used as the match criteria against which packets are checked to determine if they belong to the class specified by the class map.

The **match protocol ipx** command matches packets in the output direction only.

To use the **match protocol** command, you must first enter the **class-map** command to specify the name of the class whose match criteria you want to establish. After you identify the class, you can use one of the following commands to configure its match criteria:

- **match access-group**
- **match input-interface**
- **match mpls experimental**

If you specify more than one command in a class map, only the last command entered applies. The last command overrides the previously entered commands.

To configure NBAR to match protocol types that are supported by NBAR traffic, use the **match protocol** (NBAR) command.

Cisco 7600 Series Routers

The **match protocol** command in QoS class-map configuration configures NBAR and sends all traffic on the port, both ingress and egress, to be processed in the software on the Multilayer Switch Feature Card 2 (MSFC2).

For CBWFQ, you define traffic classes based on match criteria like protocols, ACLs, input interfaces, QoS labels, and Multiprotocol Label Switching (MPLS) EXP field values. Packets satisfying the match criteria for a class constitute the traffic for that class.

The **match protocol** command specifies the name of a protocol to be used as the match criteria against which packets are checked to determine if they belong to the class specified by the class map.

If you want to use the **match protocol** command, you must first enter the **class-map** command to specify the name of the class to which you want to establish the match criteria.

If you specify more than one command in a class map, only the last command entered applies. The last command overrides the previously entered commands.

This command can be used to match protocols that are known to the NBAR feature. For a list of protocols supported by NBAR, see the "Classification" part of the *Cisco IOS Quality of Service Solutions Configuration Guide*.

Cisco 10000 Series Routers

For CBWFQ, you define traffic classes based on match criteria including protocols, ACLs, input interfaces, QoS labels, and EXP field values. Packets satisfying the match criteria for a class constitute the traffic for that class.

The **match protocol** command specifies the name of a protocol to be used as the match criteria against which packets are checked to determine if they belong to the class specified by the class map.

The **match protocol ipx** command matches packets in the output direction only.

To use the **match protocol** command, you must first enter the **class-map** command to specify the name of the class whose match criteria you want to establish.

If you are matching NBAR protocols, use the **match protocol** (NBAR) command.

Match Protocol Command Restrictions (Catalyst 6500 Series Switches Only)

Policy maps contain traffic classes. Traffic classes contain one or more **match** commands that can be used to match packets (and organize them into groups) on the basis of a protocol type or application. You can create as many traffic classes as needed.

Cisco IOS Release 12.2(18)ZY includes software intended for use on the Catalyst 6500 series switch that is equipped with a Supervisor 32/PISA engine. For this release and platform, note the following restrictions for using policy maps and **match protocol** commands:

- A single traffic class can be configured to match a maximum of 8 protocols or applications.
- Multiple traffic classes can be configured to match a cumulative maximum of 95 protocols or applications.

Supported Protocols

Table 10 lists the protocols supported by most routers. Some routers support a few additional protocols. For example, the Cisco 7600 router supports the AARP and DECnet protocols, while the Cisco 7200 router supports the directconnect and PPPOE protocols. For a complete list of supported protocols, see the online help for the **match protocol** command on the router that you are using.

Table 10 Supported Protocols

Protocol Name	Description
802-11-iapp	IEEE 802.11 Wireless Local Area Networks Working Group Internet Access Point Protocol
ace-svr	ACE Server/Propagation
aol	America-Online Instant Messenger
appleqtc	Apple QuickTime
arp*	IP Address Resolution Protocol (ARP)
bgp	Border Gateway Protocol
biff	Biff mail notification
bootpc	Bootstrap Protocol Client
bootps	Bootstrap Protocol Server
bridge*	bridging
cddbp	CD Database Protocol
cdp*	Cisco Discovery Protocol
cifs	CIFS
cisco-fna	Cisco FNATIVE
cisco-net-mgmt	cisco-net-mgmt
cisco-svcs	Cisco license/perf/GDP/X.25/ident svcs
cisco-sys	Cisco SYSMAINT
cisco-tdp	cisco-tdp
cisco-tna	Cisco TNATIVE
citrix	Citrix Systems Metaframe
citriximaclient	Citrix IMA Client
clns*	ISO Connectionless Network Service
clns_es*	ISO CLNS End System
clns_is*	ISO CLNS Intermediate System
clp	Cisco Line Protocol
cmns*	ISO Connection-Mode Network Service
cmp	Cluster Membership Protocol
compressedtcp*	Compressed TCP
creativepartnr	Creative Partner
creativeserver	Creative Server
cuseeme	CU-SeeMe desktop video conference
daytime	Daytime (RFC 867)
dbase	dBASE Unix
dbcontrol_agent	Oracle Database Control Agent
ddns-v3	Dynamic DNS Version 3

Table 10 Supported Protocols (continued)

Protocol Name	Description
dhcp	Dynamic Host Configuration
dhcp-failover	DHCP Failover
directconnect	Direct Connect
discard	Discard port
dns	Domain Name Server lookup
dnsix	DNSIX Security Attribute Token Map
echo	Echo port
edonkey	eDonkey
egp	Exterior Gateway Protocol
eigrp	Enhanced Interior Gateway Routing Protocol
entrust-svc-handler	Entrust KM/Admin Service Handler
entrust-svcs	Entrust sps/aaas/aams
exec	Remote Process Execution
exchange	Microsoft RPC for Exchange
fasttrack	FastTrack Traffic (KaZaA, Morpheus, Grokster, and so on)
fcip-port	FCIP
finger	Finger
ftp	File Transfer Protocol
ftps	FTP over TLS/SSL
gdoi	Group Domain of Interpretation
giop	Oracle GIOP/SSL
gnutella	Gnutella Version 2 Traffic (BearShare, Shareeza, Morpheus, and so on)
gopher	Gopher
gre	Generic Routing Encapsulation
gtpv0	GPRS Tunneling Protocol Version 0
gtpv1	GPRS Tunneling Protocol Version 1
h225ras	H225 RAS over Unicast
h323	H323 Protocol
h323callsigalt	H323 Call Signal Alternate
hp-alarm-mgr	HP Performance data alarm manager
hp-collector	HP Performance data collector
hp-managed-node	HP Performance data managed node
hsrp	Hot Standby Router Protocol
http	Hypertext Transfer Protocol
https	Secure Hypertext Transfer Protocol
ica	ica (Citrix)

Table 10 Supported Protocols (continued)

Protocol Name	Description
icabrowser	icabrowser (Citrix)
icmp	Internet Control Message Protocol
ident	Authentication Service
igmpv3lite	IGMP over UDP for SSM
imap	Internet Message Access Protocol
imap3	Interactive Mail Access Protocol 3
imaps	IMAP over TLS/SSL
ip*	IP (version 4)
ipass	IPASS
ipinip	IP in IP (encapsulation)
ipsec	IP Security Protocol (ESP/AH)
ipsec-msft	Microsoft IPsec NAT-T
ipv6*	IP (version 6)
ipx	IPX
irc	Internet Relay Chat
irc-serv	IRC-SERV
ircs	IRC over TLS/SSL
ircu	IRCU
isakmp	ISAKMP
iscsi	iSCSI
iscsi-target	iSCSI port
kazaa2	Kazaa Version 2
kerberos	Kerberos
l2tp	Layer 2 Tunnel Protocol
ldap	Lightweight Directory Access Protocol
ldap-admin	LDAP admin server port
ldaps	LDAP over TLS/SSL
llc2*	llc2
login	Remote login
lotusmtap	Lotus Mail Tracking Agent Protocol
lotusnote	Lotus Notes
mgcp	Media Gateway Control Protocol
microsoft-ds	Microsoft-DS
msexch-routing	Microsoft Exchange Routing
msnmsgr	MSN Instant Messenger
msrpc	Microsoft Remote Procedure Call

Table 10 Supported Protocols (continued)

Protocol Name	Description
ms-cluster-net	MS Cluster Net
ms-dotnetster	Microsoft .NETster Port
ms-sna	Microsoft SNA Server/Base
ms-sql	Microsoft SQL
ms-sql-m	Microsoft SQL Monitor
mysql	MySQL
n2h2server	N2H2 Filter Service Port
ncp	NCP (Novell)
net8-cman	Oracle Net8 Cman/Admin
netbios	Network Basic Input/Output System
netbios-dgm	NETBIOS Datagram Service
netbios-ns	NETBIOS Name Service
netbios-ssn	NETBIOS Session Service
netshow	Microsoft Netshow
netstat	Variant of systat
nfs	Network File System
nntp	Network News Transfer Protocol
novadigm	Novadigm Enterprise Desktop Manager (EDM)
ntp	Network Time Protocol
oem-agent	OEM Agent (Oracle)
oracle	Oracle
oracle-em-vp	Oracle EM/VP
oraclenames	Oracle Names
orasrv	Oracle SQL*Net v1/v2
ospf	Open Shortest Path First
pad*	Packet assembler/disassembler (PAD) links
pcanywhere	Symantec pcANYWHERE
pcanywheredata	pcANYWHEREdata
pcanywherestat	pcANYWHEREstat
pop3	Post Office Protocol
pop3s	POP3 over TLS/SSL
pppoe	Point-to-Point Protocol over Ethernet
pptp	Point-to-Point Tunneling Protocol
printer	Print spooler/ldp
pwdgen	Password Generator Protocol
qmtp	Quick Mail Transfer Protocol

Table 10 Supported Protocols (continued)

Protocol Name	Description
radius	RADIUS & Accounting
rcmd	Berkeley Software Distribution (BSD) r-commands (rsh, rlogin, rexec)
rdb-dbs-disp	Oracle RDB
realmedia	RealNetwork's Realmedia Protocol
realsecure	ISS Real Secure Console Service Port
rip	Routing Information Protocol
router	Local Routing Process
rsrb*	Remote Source-Route Bridging
rsvd	RSVD
rsvp	Resource Reservation Protocol
rsvp-encap	RSVP ENCAPSULATION-1/2
rsvp_tunnel	RSVP Tunnel
rtc-pm-port	Oracle RTC-PM port
rtelnet	Remote Telnet Service
rtp	Real-Time Protocol
rtsp	Real-Time Streaming Protocol
r-winsock	remote-winsock
secure-ftp	FTP over Transport Layer Security/Secure Sockets Layer (TLS/SSL)
secure-http	Secured HTTP
secure-imap	Internet Message Access Protocol over TLS/SSL
secure-irc	Internet Relay Chat over TLS/SSL
secure-ldap	Lightweight Directory Access Protocol over TLS/SSL
secure-nntp	Network News Transfer Protocol over TLS/SSL
secure-pop3	Post Office Protocol over TLS/SSL
secure-telnet	Telnet over TLS/SSL
send	SEND
shell	Remote command
sip	Session Initiation Protocol
sip-tls	Session Initiation Protocol-Transport Layer Security
skinny	Skinny Client Control Protocol
sms	SMS RCINFO/XFER/CHAT
smtp	Simple Mail Transfer Protocol
snapshot	Snapshot routing support
snmp	Simple Network Protocol
snmptrap	SNMP Trap
socks	Sockets network proxy protocol (SOCKS)

Table 10 Supported Protocols (continued)

Protocol Name	Description
sqlnet	Structured Query Language (SQL)*NET for Oracle
sqlserv	SQL Services
sqlsrv	SQL Service
sqlserver	Microsoft SQL Server
ssh	Secure shell
sshell	SSLshell
ssp	State Sync Protocol
streamwork	Xing Technology StreamWorks player
stun	cisco Serial Tunnel
sunrpc	Sun remote-procedure call (RPC)
syslog	System Logging Utility
syslog-conn	Reliable Syslog Service
tacacs	Login Host Protocol (TACACS)
tacacs-ds	TACACS-Database Service
tarantella	Tarantella
tcp	Transport Control Protocol
telnet	Telnet
telnets	Telnet over TLS/SSL
tftp	Trivial File Transfer Protocol
time	Time
timed	Time server
tr-rsrb	cisco RSRB
tto	Oracle TTC/SSL
udp	User Datagram Protocol
uucp	UUCPD/UUCP-RLOGIN
vdolive	VDOLive streaming video
vofr*	Voice over Frame Relay
vqp	VLAN Query Protocol
webster	Network Dictionary
who	Who's service
wins	Microsoft WINS
x11	X Window System
xdmcp	XDM Control Protocol
xwindows*	X-Windows remote access
ymsgr	Yahoo! Instant Messenger

* This protocol is not supported on the Catalyst 6500 series switch that is equipped with a Supervisor 32/PISA engine.

Examples

The following example specifies a class map named ftp and configures the FTP protocol as a match criterion:

```
Router(config)# class-map ftp
Router(config-cmap)# match protocol ftp
```

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

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 for the IP protocol will be monitored based on the parameters specified in the flow monitor configuration named **fm-2**:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# match protocol ip
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.
service-policy type performance-monitor	Associates a Performance Monitor policy with an interface.
match access-group	Configures the match criteria for a class map based on the specified ACL.
match input-interface	Configures a class map to use the specified input interface as a match criterion.
match mpls experimental	Configures a class map to use the specified value of the experimental field as a match criterion.
match precedence	Identifies IP precedence values as match criteria.
match protocol (NBAR)	Configures NBAR to match traffic by a protocol type known to NBAR.
match qos-group	Configures a class map to use the specified EXP field value as a match criterion.

match qos-group

To identify a specific quality of service (QoS) group value as a match criterion, use the **match qos-group** command in class-map configuration or policy inline configuration mode. To remove a specific QoS group value from a class map, use the **no** form of this command.

match qos-group *qos-group-value*

no match qos-group *qos-group-value*

Syntax Description

qos-group-value	The exact value from 0 to 99 used to identify a QoS group value.

Command Default

No match criterion is specified.

Command Modes

Class-map configuration (config-cmap)
Policy inline configuration (config-if-spolicy-inline)

Command History

Release	Modification
11.1CC	This command was introduced.
12.0(5)XE	This command was integrated into Cisco IOS Release 12.0(5)XE.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB	This command was integrated into Cisco IOS Release 12.2(31)SB and implemented on the Cisco 10000 series routers.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1 and implemented on Cisco ASR 1000 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 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.

The **match qos-group** command is used by the class map to identify a specific QoS group value marking on a packet. This command can also be used to convey the received Multiprotocol Label Switching (MPLS) experimental (EXP) field value to the output interface.

The *qos-group-value* argument is used as a marking only. The QoS group values have no mathematical significance. For instance, the *qos-group-value* of 2 is not greater than 1. The value simply indicates that a packet marked with the *qos-group-value* of 2 is different than a packet marked with the *qos-group-value* of 1. The treatment of these packets is defined by the user through the setting of QoS policies in QoS policy-map class configuration mode.

The QoS group value is local to the router, meaning that the QoS group value that is marked on a packet does not leave the router when the packet leaves the router. If you need a marking that resides in the packet, use IP precedence setting, IP differentiated services code point (DSCP) setting, or another method of packet marking.

This command can be used with the **random-detect discard-class-based** command.

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

You must first enter the s**ervice-policy type performance-monitor inline** command.

Examples

The following example shows how to configure the service policy named priority50 and attach service policy priority50 to an interface. In this example, the class map named qosgroup5 will evaluate all packets entering Fast Ethernet interface 1/0/0 for a QoS group value of 5. If the incoming packet has been marked with the QoS group value of 5, the packet will be treated with a priority level of 50.

```
Router(config)# class-map qosgroup5
Router(config-cmap)# match qos-group 5
Router(config)# exit
Router(config)# policy-map priority50
Router(config-pmap)# class qosgroup5
Router(config-pmap-c)# priority 50
Router(config-pmap-c)# exit
Router(config-pmap)# exit
Router(config)# interface fastethernet1/0/0
Router(config-if)# service-policy output priority50
```

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

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 criteria of a QoS value of 4 will be monitored based on the parameters specified in the flow monitor configuration named **fm-2**:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# match qosgroup 4
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.
service-policy type performance-monitor	Associates a Performance Monitor policy with an interface.
policy-map	Creates or modifies a policy map that can be attached to one or more interfaces to specify a service policy.
random-detect discard-class-based	Bases WRED on the discard class value of a packet.

Command	Description
service-policy	Attaches a policy map to an input interface or VC, or an output interface or VC, to be used as the service policy for that interface or VC.
set precedence	Specifies an IP precedence value for packets within a traffic class.
set qos-group	Sets a group ID that can be used later to classify packets.

match source-address mac

To use the source MAC address as a match criterion, use the **match source-address mac** command in class-map configuration or policy inline configuration mode. To remove a previously specified source MAC address as a match criterion, use the **no** form of this command.

match source-address mac *address-source*

no match source-address mac *address-source*

Syntax Description

address-source	The source source MAC address to be used as a match criterion.

Command Default

No match criterion is configured.

Command Modes

Class-map configuration (config-cmap)
Policy inline configuration (config-if-spolicy-inline)

Command History

Release	Modification
12.0(5)XE	This command was introduced.
12.1(1)E	This command was integrated into Cisco IOS Release 12.1(1)E.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB	This command was integrated into Cisco IOS Release 12.2(31)SB and implemented on the Cisco 10000 series.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
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 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.

This command can be used only on an input interface with a MAC address; for example, Fast Ethernet and Ethernet interfaces.

This command cannot be used on output interfaces with no MAC address, such as serial and ATM interfaces.

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

You must first enter the s**ervice-policy type performance-monitor inline** command.

Examples

The following example uses the MAC address mac 0.0.0 as a match criterion:

```
Router(config)# class-map matchsrcmac
Router(config-cmap)# match source-address mac 0.0.0
```

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

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 specified MAC source address will be monitored based on the parameters specified in the flow monitor configuration named **fm-2**:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# match source-address mac 0.0.0
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.
service-policy type performance-monitor	Associates a Performance Monitor policy with an interface.

match transport destination-port

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

match transport destination-port

no match transport destination-port

Syntax Description

This command has no arguments or keywords.

Command Default

The use of the destination port 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
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

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 destination port as a key field:

```
Router(config)# flow record type performance-monitor PM-RECORD-4
Router(config-flow-record)# match transport destination-port
```

Related CommandsC

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

match transport rtp ssrc

To configure the SSRC field in RTP packet header as a key field for a flow record, use the **match transport rtp ssrc** command in flow record configuration mode. To disable the use of the SSRC field as a key field for a flow record, use the **no** form of this command.

match transport rtp ssrc

no match transport rtp ssrc

Syntax Description

This command has no arguments or keywords.

Command Default

The use of the SSRC field in RTP packet header 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
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

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

The SSRC field in RTP packet header is used to identify a different stream source which is using the same protocol and source and destination IP address and port.

Examples

The following example configures the SSRC field in RTP packet header as a key field:

```
Router(config)# flow record type performance-monitor PM-RECORD-4
Router(config-flow-record)# match transport rtp ssrc
```

Related Commands

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

match transport source-port

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

match transport source-port

no match transport source-port

Syntax Description

This command has no arguments or keywords.

Command Default

The use of the source port 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
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

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 source port as a key field:

```
Router(config)# flow record type performance-monitor PM-RECORD-4
Router(config-flow-record)# match transport source-port
```

Related Commands

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

match vlan

To define the VLAN match criteria, use the **match vlan** command in class-map configuration or policy inline configuration mode. To remove the match criteria, use the **no** form of this command.

match vlan {*vlan-id* | *vlan-range* | *vlan-combination*}

no match vlan

Syntax Description

vlan-id	The VLAN identification number. Valid range is from 1 to 4094; do not enter leading zeros.
vlan-range	A VLAN range. For example, 1 - 3.
vlan-combination	A combination of VLANs. For example, 1 - 3 5 - 7.

Command Default

No match criterion is configured.

Command Modes

Class-map configuration (config-cmap)
Policy inline configuration (config-if-spolicy-inline)

Command History

Release	Modification
12.2(4)JA	This command was introduced.
12.4(2)T	This command was integrated into Cisco IOS Release 12.4(2)T.
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 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.

Use the **match vlan** command to specify which fields in the incoming packets are examined to classify the packets. Only the IP access group or the MAC access group matching the Ether Type/Len field are supported.

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

You must first enter the s**ervice-policy type performance-monitor inline** command.

Examples

The following example uses the VLAN ID as a match criterion:

```
Router(config)# class-map matchsrcmac
Router(config-cmap)# match vlan 2
```

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

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 criteria of a VLAN ID of 2 will be monitored based on the parameters specified in the flow monitor configuration named **fm-2**:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# match vlan 2
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.
service-policy type performance-monitor	Associates a Performance Monitor policy with an interface.

max-dropout (policy RTP)

To configure the maximum dropout metric for a Performance Monitor policy, use the **max-dropout** command in policy RTP configuration mode. To remove the configuration, use the **no** form of this command.

max-dropout *number*

no max-dropout *number*

Syntax Description

number	Specifies the maximum number of packets to ignore ahead of the current packet in terms of sequence number.

Command Default

Maximum number of dropouts is 5.

Command Modes

policy RTP configuration (config-pmap-c-mrtp)
policy inline RTP configuration (config-spolicy-inline-mrtp)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Examples

The following example shows how to set the maximum RTP dropout, while configuring a policy-map:

```
Router(config)# policy-map type performance-monitor policy-4
Router(config-pmap)# class PM-CLASS-4
Router(config-pmap-c)# monitor metric rtp
Router(config-pmap-c-mrtp)# max-dropout 20
```

The following example shows how to set the maximum RTP dropout, while associating a service-policy with an interface:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# monitor metric rtp
Router(config-spolicy-inline-mrtp)# max-dropout 20
```

Related Commands

Command	Description
policy-map type performance-monitor	Creates a policy for Performance Monitor.
service-policy type performance-monitor	Associates a policy with an interface.

max-reorder (policy RTP)

To configure the maximum reorder metric for a Performance Monitor policy, use the **max-reorder** command in policy RTP configuration mode. To remove the configuration, use the **no** form of this command.

max-reorder *number*

no max-reorder *number*

Syntax Description

number	Specifies the maximum number of packets to ignore ahead of the current packet in terms of sequence number.

Command Default

Maximum number of reorders is 5.

Command Modes

policy RTP configuration (config-pmap-c-mrtp)
policy inline RTP configuration (config-spolicy-inline-mrtp)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Examples

The following example shows how to set the maximum RTP reorder, while configuring a policy-map:

```
Router(config)# policy-map type performance-monitor policy-4
Router(config-pmap)# class PM-CLASS-4
Router(config-pmap-c)# monitor metric rtp
Router(config-pmap-c-mrtp)# max-reorder 20
```

The following example shows how to set the maximum RTP reorder, while associating a service-policy with an interface:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# monitor metric rtp
Router(config-spolicy-inline-mrtp)# max-reorder 20
```

Related Commands

Command	Description
policy-map type performance-monitor	Creates a policy for Performance Monitor.
service-policy type performance-monitor	Associates a policy with an interface.

min-sequential (policy RTP)

To configure the mimimum number of packets in a sequence used to classify an RTP flow, use the **min-sequential** command in policy RTP configuration mode. To remove the configuration, use the **no** form of this command.

min-sequential *number*

no min-sequential *number*

Syntax Description

number	Specifies the mimimum number of sequental packets required to identify a stream as being an RTP flow.

Command Default

min-sequential is 5.

Command Modes

policy RTP configuration (config-pmap-c-mrtp)
policy inline RTP configuration (config-spolicy-inline-mrtp)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Examples

The following example shows how to set the mimimum number of packets in a sequence used to classify an RTP flow, while configuring a policy-map:

```
Router(config)# policy-map type performance-monitor policy-4
Router(config-pmap)# class PM-CLASS-4
Router(config-pmap-c)# monitor metric rtp
Router(config-pmap-c-mrtp)# min-sequential 20
```

The following example shows how to set the mimimum number of packets in a sequence used to classify an RTP flow, while associating a service-policy with an interface:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# monitor metric rtp
Router(config-spolicy-inline-mrtp)# min-sequential 20
```

Related Commands

Command	Description
policy-map type performance-monitor	Creates a policy for Performance Monitor.
service-policy type performance-monitor	Associates a policy with an interface.

monitor metric ip-cbr

To configure IP-CBR monitor metrics for a Performance Monitor policy, use the **monitor metric ip-cbr** command in policy configuration mode. To remove the configuration, use the **no** form of this command.

monitor metric ip-cbr

no monitor metric ip-cbr

Syntax Description

This command has no arguments or keywords.

Command Modes

policy RTP configuration (config-pmap-c)
policy inline RTP configuration (config-if-spolicy-inline)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Examples

The following example shows how to set the layer 3 transmission rate to 10 gbps, while configuring a policy-map:

```
Router(config)# policy-map type performance-monitor policy-4
Router(config-pmap)# class PM-CLASS-4
Router(config-pmap-c)# monitor metric ip-cbr
Router(config-pmap-c-mipcbr)# rate layer3 10 gbps
```

The following example shows how to set the layer 3 transmission rate to 10 gbps, while associating a service-policy with an interface:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# monitor metric ip-cbr
Router(config-spolicy-inline-mipcbr)# rate layer3 10 gbps
```

Related Commands

Command	Description
policy-map type performance-monitor	Creates a policy for Performance Monitor.
service-policy type performance-monitor	Associates a policy with an interface.

monitor metric rtp

To configure RTP monitor metrics for a Performance Monitor policy, use the **monitor metric rtp** command in policy configuration mode. To remove the configuration, use the **no** form of this command.

monitor metric rtp

no monitor metric rtp

Syntax Description

This command has no arguments or keywords.

Command Modes

policy configuration (config-pmap-c)
policy inline configuration (config-if-spolicy-inline)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Examples

The following example shows how to set the RTP monitor metrics, while configuring a policy-map:

```
Router(config)# policy-map type performance-monitor policy-4
Router(config-pmap)# class PM-CLASS-4
Router(config-pmap-c)# monitor metric rtp
```

The following example shows how to set the RTP monitor metrics, while associating a service-policy with an interface:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# monitor metric rtp
```

Related Commands

Command	Description
policy-map type performance-monitor	Creates a policy for Performance Monitor.
service-policy type performance-monitor	Associates a policy with an interface.

monitor parameters

To configure monitor parameters for a Performance Monitor policy, use the **monitor parameters** command in policy configuration mode. To remove the configuration, use the **no** form of this command.

monitor parameters

no monitor parameters

Syntax Description

This command has no arguments or keywords.

Command Modes

Policy configuration (config-pmap-c)
Policy inline configuration (config-if-spolicy-inline))

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Examples

The following example shows how to set the amount of time wait for a response when collecting data to 20 seconds, while configuring a policy-map:

```
Router(config)# policy-map type performance-monitor policy-4
Router(config-pmap)# class PM-CLASS-4
Router(config-pmap-c)# monitor parameters
Router(config-pmap-c-mparam)# timeout 20
```

The following example shows how to set the amount of time wait for a response when collecting data to 20 seconds, while associating a service-policy with an interface:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# monitor parameters
Router(config-spolicy-inline-mparam)# timeout 20
```

Related Commands

Command	Description
policy-map type performance-monitor	Creates a policy for Performance Monitor.
service-policy type performance-monitor	Associates a policy with an interface.

option (Flexible NetFlow)

To configure options data parameters for a flow exporter for Flexible NetFlow or Performance Monitor, use the **option** command in flow exporter configuration mode. To remove options for a flow exporter, use the **no** form of this command.

option {**application-table | exporter-stats | interface-table | sampler-table | vrf-table**} [**timeout** *seconds*]

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

Syntax Description

application-table	Configures the application table option for flow exporters.
exporter-stats	Configures the exporter statistics option for flow exporters.
interface-table	Configures the interface table option for flow exporters.
sampler-table	Configures the export sampler information 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. Range: 1 to 86400. Default 600.

Command Default

The timeout is 600 seconds. All other options 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 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.
15.0(1)M	This command was modified. The **application-table** and **vrf-table** keywords were added in Cisco IOS Release 15.0(1)M.
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 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
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.

option application-table

This command causes the periodic sending of an options table, which will allow the collector to map the Network Based Application Recognition (NBAR) application IDs provided in the flow records to application names. The optional timeout can alter the frequency at which the reports are sent.

option exporter-stats

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

option interface-table

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

option sampler-table

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

option vrf-table

This command causes the periodic sending of an options table, which will allow the collector to map the VRF IDs provided in the flow records to VRF names. The optional timeout can alter the frequency at which the reports are sent.

Examples

The following example causes the periodic sending of the exporter statistics, including the number of records, bytes, and packets sent:

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

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

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

The following example causes the periodic sending of an options table, which details the configuration of each sampler and allows the collector to map the sampler ID provided in any flow record to a configuration that it can use to scale up the flow statistics:

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

The following example causes the periodic sending of an options table, which allows the collector to map the NBAR application IDs provided in the flow records to application names:

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

The following example causes the periodic sending of an options table, which allows the collector to map the VRF IDs provided in the flow records to VRF names:

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

policy-map type performance-monitor

To configure a policy for Performance Monitor, use the **policy-map type performance-monitor** command in global configuration mode. To remove the policy, use the **no** form of this command.

policy-map type performance-monitor *policy-name*

no policy-map type performance-monitor *policy-name*

Syntax Description

policy-name	Specifies the name of the Performance Monitor policy to create or edit.

Command Modes

Global configuration (config)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

If you do not have an existing flow monitor, you can still configure a flow policy by using the **flow monitor inline** command to create a new flow monitor.

Examples

The following example shows how to configure a Performance Monitor policy.

```
Router(config)# policy-map type performance-monitor PM-POLICY-4
```

Related Commands

Command	Description
flow monitor type performance-monitor	Creates a flow monitor.
flow record type performance-monitor	Creates a flow record for Performance Monitor.
service-policy type performance-monitor	Associates a policy with an interface.

rate layer3

To configure a Layer 3 transmission rate for a Performance Monitor policy, use the **rate layer3** command in policy IP-CBR configuration mode. To remove the configuration, use the **no** form of this command.

rate layer3 {*rate-byte* {**bps** | **kbps** | **mbps** | **gbps**} | **packet**}

no rate layer3 {*rate-byte* {**bps** | **kbps** | **mbps** | **gbps**} | **packet**}

Syntax Description

rate-byte	Rate in Bps, kBps, mBps, or gBps. The range is from 1 to 65535.
bps	Specifies that the rate is in bytes per second.
kbps	Specifies that the rate is in kilobytes per second.
mbps	Specifies that the rate is in megabytes per second. The default is 100.
gbps	Specifies that the rate is in gigabytes per second.
packet	Use the rate specified in the packet.

Command Default

The Layer 3 transmission rate is 100 mbps.

Command Modes

Policy IP-CBR configuration (config-pmap-c-mipcbr)
Policy inline IP-CBR configuration (config-spolicy-inline-mipcbr)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Examples

The following example shows how to set the Layer 3 transmission rate to 10 gbps, while configuring a policy-map:

```
Router(config)# policy-map type performance-monitor policy-4
Router(config-pmap)# class PM-CLASS-4
Router(config-pmap-c)# monitor metric ip-cbr
Router(config-pmap-c-mipcbr)# rate layer3 10 gbps
```

The following example shows how to set the Layer 3 transmission rate to 10 gbps, while associating a service-policy with an interface:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# monitor metric ip-cbr
Router(config-spolicy-inline-mipcbr)# rate layer3 10 gbps
```

Related CommandsR

Command	Description
policy-map type performance-monitor	Creates a policy for Performance Monitor.
service-policy type performance-monitor	Associates a policy with an interface.

react (policy)

To configure threshold parameters for a Performance Monitor policy, use the **react** command in policy configuration mode. To disable all threshold monitoring or to disable individual monitored elements, use the **no** form of this command.

react *ID* {**media-stop** | **mrv** | **rtp-jitter-average** | **transport-packets-lost-rate**}

no react *ID* {**media-stop** | **mrv** | **rtp-jitter-average** | **transport-packets-lost-rate**}

Syntax Description

ID	ID for react configuration. The range is 1 to 65535.
media-stop	A reaction occurs when no traffic is found for the flow.
mrv	A reaction occurs when the MRV value violates the threshold. MRV is a fixed-point percentage, calculated by dividing the difference between the actual rate and the expected rate, by the expected rate.
rtp-jitter-average	A reaction occurs when the average jitter value violates the threshold.
transport-packets-lost-rate	A reaction occurs when the rate at which transport packets are lost violates the threshold. This rate is calculated by dividing the number of lost packets by the expected packet count.

Command Default

Service policy threshold monitoring is disabled.

Command Modes

policy configuration (config-pmap-c)
policy inline configuration (config-if-spolicy-inline)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

You can configure multiple **react** commands for a Performance Monitor policy.

Examples

The following example shows how to specify that SNMP MIB variables will receive an alarm or notification, while configuring a policy-map:

```
Router(config)# policy-map type performance-monitor policy-4
Router(config-pmap)# class PM-CLASS-4
Router(config-pmap-c)# react 2000 rtp-jitter-average
Router(config-pmap-c-react)# action snmp
```

The following example shows how to specify that SNMP MIB variables will receive an alarm or notification, while associating a service-policy with an interface:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# react 2000 rtp-jitter-average
Router(config-spolicy-inline-react)# action snmp
```

Related Commands

Command	Description
policy-map type performance-monitor	Creates a policy for Performance Monitor.
service-policy type performance-monitor	Associates a policy with an interface.

record (Performance Monitor)

To associate a flow record with a flow monitor for Performance Monitor, use the **record** command in the appropriate Performance Monitor configuration mode. To remove the association, use the **no** form of this command.

record {*record-name* | **default-rtp** | **default-tcp**}

no record {*record-name* | **default-rtp** | **default-tcp**}

Syntax Description

record-name	Specifies which flow record is being associated.
default-rtp	Specifies that the default RTP flow record is being associated.
default-tcp	Specifies that the default TCP flow record is being associated.

Command Modes

Flow monitor configuration (config-flow-monitor)
Monitor configuration (config-pmap)
Policy monitor configuration (config-pmap-c-flowmon)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

You can associate a flow record with a flow monitor for Performance Monitor while configuring either a flow monitor, policy map, or service policy.

Examples

The following example shows how to configure a flow record:

```
Router(config)# policy-map type performance-monitor policy-4
Router(config-pmap)# class class-4
Router(config-pmap-c)# flow monitor inline
Router(config-pmap-c-flowmon)# record record-4
```

Related Commands

Command	Description
flow monitor type performance-monitor	Creates a flow monitor.
policy-map type performance-monitor	Creates a policy map.
service-policy type performance-monitor	Associates policy map with an interface.

rename (policy)

To rename a policy for Performance Monitor, use the **rename** command in the policy configuration mode.

rename *policy-name*

Syntax Description

policy-name	The new name for the policy.

Command Modes

Policy configuration (config-pmap)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Examples

The following example shows how to rename a policy:

```
Router(config)# policy-map type performance-monitor policy-4
Router(config-pmap)# rename policy-20
```

Related Commands

Command	Description
policy-map type performance-monitor	Creates a policy map.

service-policy type performance-monitor

To configure the association of a Performance Monitor policy to an interface, use the **service-policy type performance-monitor** command in interface configuration mode. To remove the association, use the **no** form of this command.

service-policy type performance-monitor {{**input** | **output**} *policy-name* | **inline** {**input** | **output**}}

no service-policy type performance-monitor {{**input** | **output**} *policy-name* | **inline** {**input** | **output**}}

Syntax Description

input	Assocate the Performance Monitor policy to the incoming interface.
output	Assocate the Performance Monitor policy to the outgoing interface.
policy-name	Specifies which Performance Monitor policy to assocate to an interface.
inline	Enters inline mode to configure a new flow monitor for the Performance Monitor policy.

Command Modes

interface configuration (config-if)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

If you do not have an existing flow policy, you can still association a flow policy to an interface by using the **inline** option to create a new flow policy.

Examples

The following example shows how to configure an association of a Performance Monitor policy to an interface for the input direction.

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor input PM-POLICY-4
```

Related Commands

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

show performance monitor cache

To display the contnet of the cache for Performance Monitor, use the **show performance monitor cache** command in privileged EXEC mode.

show performance monitor cache [**policy** *policy map name* **class** *class map name*] [**interface** *interface name*]

Syntax Description

policy *policy map name*	Show statistics only for the specified policy.
class *class map name*	Show statistics only for the specified class.
interface *interface name*	Show statistics for the specified interface.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

If no flow policy or interface is specified, all for all flow policies and interfaces are shown.

Examples

The following example shows the output for this command:

```
Router # show performance monitor cache

MMON Metering Layer Stats:
  static pkt cnt: 3049
  static cce sb cnt: 57
  dynamic pkt cnt: 0

  Cache type:                               Permanent
  Cache size:                                    2000
  Current entries:                                  8
  High Watermark:                                   9

  Flows added:                                      9
  Updates sent            (  1800 secs)             0

IPV4 SRC ADDR    IPV4 DST ADDR    IP PROT  TRNS SRC PORT  TRNS DST PORT

ipv4 ttl ipv4 ttl min ipv4 ttl max  ipv4 dscp bytes long perm pktslong perm  user space vm

==============================================================================================
10.1.1.1         10.1.2.3              17           4000           1967
0             0             0  0x00                          80
1 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
```

```
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000

10.1.1.1         10.1.2.3              17           6000           1967
0             0             0  0x00                          80
1  0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000

10.1.1.1         10.1.2.3              17           4000           2000
0             0             0  0x00                          44
1  0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000
10.1.1.1         10.1.2.3               6           6000           3000
0             0             0  0x00                          84
2  0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000
10.1.1.1         10.1.2.3              17           1967           6001
0             0             0  0x00                          36
1  0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000
10.1.1.1         10.1.2.3              17           1967           4001
0             0             0  0x00                          36
1  0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000
10.1.1.1         10.1.2.3               6           3001           6001
0             0             0  0x00                         124
3  0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000
10.1.1.1         10.1.2.3              17           2001           4001
0             0             0  0x00                          44
1  0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
```

```
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000
```

Table 11 describes the significant fields shown in the display.

Table 11 show performance monitor cache Field Descriptions

Field	Description
static pkt cnt	Number static packets collected in this cache.
static cce sb cnt	Number of CCE SBs.
dynamic pkt cnt	Number of dynamic packets in this cache
Cache type	Type fo cache.
Cache size	Maximum number of entries that can be collected in this cache.
Current entries	Current number of entries collected in this cache.
High Watermark	Highest number of entries collected in this cache.
Flows added	Number of flows added for this cache.
Updates sent	Number of updates sent for this cahe.
IPV4 SRC ADDR	IP address of the source of the flow.
IPV4 DST ADDR	IP addres of the destiation of the flow.
IP PROT	IP protocil used by the flow.
TRNS SRC PORT	Port number used by the source of the flow.
TRNS DST PORT	Port number used by the destiantion of flow.
ipv4 ttl	IPv4 time-to-live (TTL).
ipv4 ttl min	Miniumum IPv4 time-to-live (TTL).
ipv4 ttl max	Maximum IPv4 time-to-live (TTL).
ipv4 dscp	IPv4 differentiated services code point (DCSP).
bytes long perm	Number of long perm bytes.
pkts long perm	Number of long perm packets.
user space vm	User space VM.

Related CommandsR

Command	Description
show performance monitor historical	Displays historical sets of statistics collected by Performance Monitor.

show performance monitor clock rate

To display information about clock rates for performance monitor classes, use the **show performance monitor clock rate** command in privileged EXEC mode.

show performance monitor clock rate [**policy** *policy map name* **class** *class map name*]

Syntax Description

policy *policy map name*	Show statistics only for the specified policy.
class *class map name*	Show statistics only for the specified class.

Command Modes

privileged EXEC

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

You must have at least one active session before clock information can be displayed.

Examples

The following example displays performance monitor clock rate information:

```
Router# show performance monitor clock rate

Load for five secs: 6%/2%; one minute: 5%; five minutes: 5% Time source is NTP,
17:41:35.508 EST Wed Feb 16 2011

RTP clock rate for Policy: all-apps-w-mask, Class: IPTV
     Payload type     Clock rate(Hz)

     pcmu    (0  )     8000
     gsm     (3  )     8000
     g723    (4  )     8000
     dvi4    (5  )     8000
     dvi4-2  (6  )     16000
     lpc     (7  )     8000
     pcma    (8  )     8000
     g722    (9  )     8000
     l16-2   (10 )     44100
     l16     (11 )     44100
     qcelp   (12 )     8000
     cn      (13 )     8000
     mpa     (14 )     90000
     g728    (15 )     8000
     dvi4-3  (16 )     11025
     dvi4-4  (17 )     22050
     g729    (18 )     8000
     celb    (25 )     90000
     jpeg    (26 )     90000
     nv      (28 )     90000
     h261    (31 )     90000
```

```
     mpv     (32 )     90000
     mp2t    (33 )     90000
     h263    (34 )     90000
     default           90000

RTP clock rate for Policy: all-apps, Class: telepresence-CS4
     Payload type     Clock rate(Hz)

     pcmu    (0  )     8000
     gsm     (3  )     8000
     g723    (4  )     8000
     dvi4    (5  )     8000
     dvi4-2  (6  )     16000
     lpc     (7  )     8000
     pcma    (8  )     8000
     g722    (9  )     8000
     l16-2   (10 )     44100
     l16     (11 )     44100
     qcelp   (12 )     8000
     cn      (13 )     8000
     mpa     (14 )     90000
     g728    (15 )     8000
     dvi4-3  (16 )     11025
     dvi4-4  (17 )     22050
     g729    (18 )     8000
     celb    (25 )     90000
     jpeg    (26 )     90000
     nv      (28 )     90000
     h261    (31 )     90000
     mpv     (32 )     90000
     mp2t    (33 )     90000
     h263    (34 )     90000
             (96 )     48000
             (112)     90000
     default           90000


RTP clock rate for Policy: all-apps, Class: IPVS-traffic-rtp
     Payload type     Clock rate(Hz)

     pcmu    (0  )     8000
     gsm     (3  )     8000
     g723    (4  )     8000
     dvi4    (5  )     8000
     dvi4-2  (6  )     16000
     lpc     (7  )     8000
     pcma    (8  )     8000
     g722    (9  )     8000
     l16-2   (10 )     44100
     l16     (11 )     44100
     qcelp   (12 )     8000
     cn      (13 )     8000
     mpa     (14 )     90000
     g728    (15 )     8000
     dvi4-3  (16 )     11025
     dvi4-4  (17 )     22050
     g729    (18 )     8000
     celb    (25 )     90000
     jpeg    (26 )     90000
     nv      (28 )     90000
     h261    (31 )     90000
     mpv     (32 )     90000
     mp2t    (33 )     90000
     h263    (34 )     90000
```

```
            (96 )      30000
    default            90000
```

Table 12 describes the significant fields shown in the display.

Table 12 show performance monitor clock Field Descriptions

Field	Description
Payload type	The values for the payload type and their associated type numbers are celb (25), cn (13), dvi4 (5) (8000 Hz as described in RFC 3551, *RTP Profile for Audio and Video Conferences with Minimal Control*), dvi4-2 (6) (8000 Hz as described in RFC 3551), dvi4-3 (16) (DVI4 Dipol 11025 Hz), dvi4-4 (17) DVI4 Dipol 22050 Hz), g722 (9), g723 (4), g728 (15), g729 (18), gsm (3), h261 (31), h263 (34), jpeg (26), l16 (11) (L16 channel 1), l16-2 (10) (L16 channel 2), lpc (7), mp2t (33), mpa (14), mpv (32), nv (28), pcma (8), pcmu (0), qcelp (12).
Clock rate(Hz)	Clock rate in cycles per sec (Hz).

Related Commands

Command	Description
clock-rate	Configure the rate for the RTP packet time-stamp clock.

show performance monitor clients

To display information about clients for performance monitor, use the **show performance monitor clients** command in privileged EXEC mode.

show performance monitor clients {**detail** {*client-ID* | **all**} | **list**}

Syntax Description

detail *client-ID*	Show detailed information for the specified clients.
detail all	Show detailed information for all clients.
list	Show a list of clients.

Command Modes

privileged EXEC

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

You must have Cisco Mediatrace configured and at least one active session before client information can be displayed.

Examples

The following example displays a list of performance monitor clients:

```
Router# show performance monitor clients list

Dynamic Video Monitor Client database list:
Total number of active clients: 1
ID name age(secs) flow(src,dst,src-port, dst-port)

1 Mediatrace-158244661 7498 10.10.10.1 1000 10.10.12.2 2000 17
```

Table 13 describes the significant fields shown in the display.

The following example displays details for all performance monitor clients:

```
Router# show performance monitor clients detail all

Client name for ID 1 : Mediatrace-131419052
   Type: Mediatrace
   Age: 443 seconds
   Monitor Object: _MMON_DYN_-class-map-69
        Flow spec: (dvmc-acl#47) 10.10.130.2 1000 10.10.132.2 2000 17
        monitor parameters
                interval duration 60
                timeout 2
                history 1
                flows 100
        monitor metric rtp
                min-sequential 10
```

```
        max-dropout 5
        max-reorder 5
        clock-rate 112 90000
        clock-rate default 90000
        ssrc maximum 20
monitor metric ip-cbr
        rate layer3 packet 20
Flow record: dvmc_fnf_fdef_47
        Key fields:
                ipv4 source address
                ipv4 destination address
                transport source-port
                transport destination-port
                ip protocol
        Non-key fields:
                monitor event
                application media event
                routing forwarding-status
                ip dscp
                ip ttl
                counter bytes rate
                application media bytes rate
                transport rtp jitter mean
                transport packets lost counter
                transport packets expected counter
                transport event packet-loss counter
                transport packets lost rate
                timestamp interval
                counter packets dropped
                counter bytes
                counter packets
                application media bytes counter
                application media packets counter
Monitor point: _MMON_DYN_-policy-map-70 GigabitEthernet0/3 output
Classification Statistic:
        matched packet: 545790
        matched byte: 64403220
```

Table 14 describes the significant fields shown in the display.

Table 13 show performance monitor clients list Field Descriptions

Field	Description
Total number of active clients	Number of active clients.
ID	ID of the client.
Name	Name of the client.
Age(secs)	Number seconds the client has been active.
Flow (src)	IP address of the source of the flow.
Flow(dst)	IP address of the destination of the flow.
Flow(src-port)	Port number of the source of the flow.
Flow(dst-port)	Port number of the destination of the flow.

Table 14 show performance monitor clients detail all Field Descriptions

Field	Description
Client name for ID *number*	Name and ID of the client.
Type	Type of client
Age	Number seconds the client has been active.
Monitor Object: _MMON_DYN_-class-map-69	Name of flow monitor and class map used by this client.
Flow spec: (dvmc-acl#47) 10.10.130.2 1000 10.10.132.2 2000 17	Source and destination IP addresses and ports of the flow and the code for flow protocol.
monitor parameters	Settings for the monitor parameters.
monitor metric rtp	Settings for the monitor metric RTP parameters.
monitor metric ip-cbr	Settings for the monitor metric IP-CBR parameters.
Flow record: dvmc_fnf_fdef_47	Name of the flow used by the client.
Key fields:	Key fields defined for the flow used by the client.
Non-key fields:	Non-key fields defined for the flow used by the client.
Monitor point: _MMON_DYN_-policy-map-70 GigabitEthernet0/3 output	Name of the policy map and interface used by this client.
Matched packet:	Number of packets matched to criteria defined by the flow record for the client.
Matched byte:	Number of bytes matched to criteria defined by the flow record for the client.

Related Commands

Command	Description
show performance monitor historical	Displays historical sets of statistics collected by Performance Monitor.

show performance monitor history

To display the statistics collected by Performance Monitor during the current or past intervals, use the **flow performance monitor history** command in privileged EXEC mode.

show performance monitor history [**interval** {**all** | *number* [**start** *number*]} | **interface** *interface name* [*filter*] | **policy** *policy map name* **class** *class map name* [*filter*]} | *filter*]

where *filter* = {**ip** {*source-addr source-prefix* | **any**} {*dst-addr dst-prefix* | **any**} | {**tcp** | **udp**} {*source-addr source-prefix* | **any**} {[**eq** | **lt** | **gt** *number* | **range** *min max* | **ssrc** {*ssrc-number* | **any**} | {{*dst-addr dst-prefix* | **any**} **eq** | **lt** | **gt** *number* | **range** *min max* | **ssrc** {*ssrc-number* | **any**}}

Syntax Description

interval	Show statistics only for the specified intervals.
all	Show statistics for all intervals.
number	Show statistics only for the specified number of intervals.
start *number*	Show statistics starting at the specified interval number.
interface *interface name*	Show statistics for the specified interface. If no interface is specified, show statistics for all interfaces associated with a performance-monitor policy-map.
policy *policy map name*	Show statistics only for the specified policy.
class *class map name*	Show statistics only for the specified class.
ip	Show statistics for an IP flow.
tcp	Show statistics for a TCP flow.
udp	Show statistics for a UDP flow.
source-addr source-prefix	Show statistics for the specified flow source.
any	Show statistics for any flow source.
dst-addr dst-prefix	Show statistics for the specified flow destination.
any	Show statistics for any flow destination.
eq	Show statistics only for the specified source port number.
lt	Show statistics only for source port numbers less than the specified number.
gt	Show statistics only for source port numbers greater than the specified number.
range	Show statistics only for source port number. within the specified range.
min	Minimum value for the range for which to show statistics.
max	Maximum value for the range for which to show statistics.
any	Show statistics for any destination IP address.
ssrc *ssrc-number*	Show statistics for the specified Synchronization Source.
ssrc any	Show statistics for all Synchronization Sources (SSRCs).

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

You can display the statistics collected by Performance Monitor during any or all intervals, including the current one. The duration of collection intervals is specified by the **interval duration** command.

If no flow policy or interface is specified, statistics for all flow policies and interfaces are shown.

Examples

The following example shows the output for this command:

```
Router # show performance monitor history

Codes: *   - field is not configurable under flow record
       NA  - field is not applicable for configured parameters

Match: ipv4 src addr = 1.1.1.1, ipv4 dst addr = 7.7.7.2, ipv4 prot = udp, trns src port =
20001, trns dst port = 10000, SSRC = 4294967291
 Policy: RTP_POL, Class: RTP_CLASS, Interface: GigabitEthernet0/4, Direction: input

  start time                                              14:57:34
                                                          ============
 *history bucket number                                 : 1
 *counter flow                                          : 1
  counter bytes                                         : 0
  counter bytes rate                              (Bps) : NA
 *counter bytes rate per flow                     (Bps) : NA
 *counter bytes rate per flow min                 (Bps) : NA
 *counter bytes rate per flow max                 (Bps) : NA
  counter packets                                       : 0
 *counter packets rate per flow                         : 0
  counter packets dropped                               : 0
  routing forwarding-status reason                      : Unknown
  interface input                                       : NA
  interface output                                      : NA
  monitor event                                         : true
  ipv4 dscp                                             : 0
  ipv4 ttl                                              : 57
  application media bytes counter                       : 0
  application media packets counter                     : 0
  application media bytes rate                    (Bps) : NA
 *application media bytes rate per flow           (Bps) : NA
 *application media bytes rate per flow min       (Bps) : NA
 *application media bytes rate per flow max       (Bps) : NA
  application media packets rate                  (pps) : 0
  application media event                               : Stop
 *transport rtp flow count                              : 0
  transport rtp jitter mean                      (usec) : NA
  transport rtp jitter minimum                   (usec) : NA
  transport rtp jitter maximum                   (usec) : NA
 *transport rtp payload type                            : 0
  transport event packet-loss counter                   : NA
 *transport event packet-loss counter min               : NA
 *transport event packet-loss counter max               : NA
  transport packets expected counter                    : NA
  transport packets lost counter                        : NA
 *transport packets lost counter minimum                : NA
 *transport packets lost counter maximum                : NA
```

```
 transport packets lost rate                    ( % ) : NA
*transport packets lost rate min                ( % ) : NA
*transport packets lost rate max                ( % ) : NA
*transport tcp flow count                             : 1
*transport round-trip-time sum                 (msec) : 32
*transport round-trip-time samples                    : 1
 transport round-trip-time                     (msec) : 32
*transport round-trip-time min                 (msec) : 32
*transport round-trip-time max                 (msec) : 32
```

Table 15 describes the significant fields shown in the display.

Table 15 show performance monitor history Field Descriptions

Field	Description
history bucket number	Number of the bucket of historical data collected.
counter flow	Number of flows collected.
counter bytes	Total number of bytes collected for all flows.
counter bytes rate	Average number of packets or bits (as configured) processed by the monitoring system per second during the monitoring interval for all flows.
counter bytes rate per flow	Average number of packets or bits (as configured) processed by the monitoring system per second during the monitoring interval for each flow.
counter bytes rate per flow min	Minimum threshold for the average number of packets or bits processed per second for each flow.
counter bytes rate per flow max	Maximum threshold for the average number of packets or bits processed per second for each flow.
counter packets	Total number of IP packets sent for all flows.
counter packets rate per flow	Number of IP packets sent for each flow.
counter packets dropped	IP packet drops by any intermediate system in any of the mionitored flows.

Table 15 show performance monitor history Field Descriptions (continued)

Field	Description
routing forwarding-status reason	Forwarding status is encoded using eight bits with the two most significant bits giving the status and the six remaining bits giving the reason code. Status is either unknown (00), Forwarded (10), Dropped (10) or Consumed (11). The following list shows the forwarding status values for each status category. **Unknown** • 0 **Forwarded** • Unknown 64 • Forwarded Fragmented 65 • Forwarded not Fragmented 66 **Dropped** • Unknown 128, • Drop ACL Deny 129, • Drop ACL drop 130, • Drop Unroutable 131, • Drop Adjacency 132, • Drop Fragmentation & DF set 133, • Drop Bad header checksum 134, • Drop Bad total Length 135, • Drop Bad Header Length 136, • Drop bad TTL 137, • Drop Policer 138, • Drop WRED 139, • Drop RPF 140, • Drop For us 141, • Drop Bad output interface 142, • Drop Hardware 143, **Consumed** • Unknown 192, • Terminate Punt Adjacency 193, • Terminate Incomplete Adjacency 194, • Terminate For us 195
interface out	Outgoing interface index.

Table 15 show performance monitor history Field Descriptions (continued)

Field	Description
interface in	Incoming interface index.
monitor event	Bit 1 indicates that one of the thresholds specified by a react statement for the flow was crossed at least once in the monitoring interval. Bit 2 indicates that there was a loss-of-confidence in measurement.
ipv4 dscp	IPv4 differentiated services code point (DCSP).
ipv4 ttl	IPv4 time-to-live (TTL).
application media bytes counter	Number of IP bytes from by media applications received for a specific media stream.
application media packets counter	Number of IP packets produced from media applications received for a specific media stream.
application media bytes rate	Average media bit rate (bps) for all flows during the monitoring interval.
application media bytes rate per flow	Average media bit rate (bps) for each flow during the monitoring interval.
application media bytes rate per flow min	Minimum threshold for the rate of application media bytes, in Bps, collected per flow.
application media bytes rate per flow max	Maximum threshold for the rate of application media bytes, in Bps, collected per flow.
application media event	Bit 1 is not used. Bit 2 indicates that no media application packets were seen, in other words, a Media Stop Event occured.
transport rtp flow count	Number of RTP flows collected.
transport rtp jitter mean	Mean deviation of the difference in packet spacing at the receiver compared to the sender for a pair of packets.
transport rtp jitter minimum	Minimum threshold for the deviation of the difference in packet spacing at the receiver compared to the sender for a pair of packets.
transport rtp jitter maximum	Maximum threshold for the deviation of the difference in packet spacing at the receiver compared to the sender for a pair of packets.
transport rtp payload type	Code for the payload format. Payload type codes can be defined dynamically or codes for default audio and video format can be used as defined in RFC 3551. An RTP source can change the payload type during a session, but a receiver MUST ignore packets with payload types that it does not understand. Therefore, some measurements taken during monitoring may not be accurate.
transport event packet-loss counter	Number of loss events (number of contiguous sets of lost packets).
transport event packet-loss counter min	Minimum threshold for the number of packet loss events.
transport event packet-loss counter max	Maximum threshold for the number of packet loss events.
transport packets expected counter	Number of packets expected.

Table 15 show performance monitor history Field Descriptions (continued)

Field	Description
transport packets lost counter	Number of packets lost.
transport packets lost counter minimum	Minimum threshold for the number of packets lost.
transport packets lost counter maximum	Maximum threshold for the number of packets lost.
transport packets lost rate	Rate of packets lost, in percent.
transport packets lost rate min	Minimum threshold for the percent of packets lost.
transport packets lost rate max	Maximum threshold for the percent of packets lost.
transport tcp flow count	Number of the flow collected.
transport round-trip-time sum	Total of all round-trip-times.
transport round-trip-time samples	Number of round-trip-time samples
transport round-trip-time	Average of all round-trip-times.
transport round-trip-time min	Smallest of all round-trip-times.
transport round-trip-time max	Largest of all round-trip-times.

Related Commands

Command	Description
show performance monitor status	Displays statistics collected by Performance Monitor.

show performance monitor status

To display the cumulative statistics collected by Performance Monitor during the specified number of most recent intervals, use the **show performance monitor status** command in privileged EXEC mode.

show performance monitor status [**interface** *interface name* [*filter*] | **policy** *policy map name* **class** *class map name* [*filter*]} | *filter* | **sort** {*bitrate-max* | *loss-event* | *rtt-max*}]

where *filter* = {**ip** {*source-addr source-prefix* | **any**} {*dst-addr dst-prefix* | **any**} | {**tcp** | **udp**} {*source-addr source-prefix* | **any**} {[**eq** | **lt** | **gt** *number* | **range** *min max* | **ssrc** {*ssrc-number* | **any**} | {{*dst-addr dst-prefix* | **any**} **eq** | **lt** | **gt** *number* | **range** *min max* | **ssrc** {*ssrc-number* | **any**}}

Syntax Description

interface *interface name*	Show statistics for the specified interface. If no interface is specified, show statistics for all interfaces associated with a performance-monitor policy-map.
policy *policy map name*	Show statistics only for the specified policy.
class *class map name*	Show statistics only for the specified class.
sort	Sort the statistics output.
bitrate-max	Sort the statistics output by the maximum bite rate.
loss-event	Sort the statistics output by the loss event count.
rtt-max	Sort the statistics output by the maximum Round Trip Time (RRT).
ip	Show statistics for an IP flow.
tcp	Show statistics for a TCP flow.
udp	Show statistics for a UDP flow.
source-addr source-prefix	Show statistics for the specified flow source.
any	Show statistics for any flow source.
dst-addr dst-prefix	Show statistics for the specified flow destination.
any	Show statistics for any flow destination.
eq	Show statistics only for the specified source port number.
lt	Show statistics only for source port numbers less than the specified number.
gt	Show statistics only for source port numbers greater than the specified number.
range	Show statistics only for source port number. within the specified range.
min	Minimum value for the range for which to show statistics.
max	Maximum value for the range for which to show statistics.
any	Show statistics for any destination IP address.
ssrc *ssrc-number*	Show statistics for the specified Synchronization Source.
ssrc any	Show statistics for all Synchronization Sources (SSRCs).
network *mask*	Show statistics for the specified network.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

This command displays the cumulative statistics for the specified number of most recent intervals. The number of intervals is configured using the **history** command. The default settings for this commands is 10 of the most recent collection intervals. The duration of collection intervals is specified by the **interval duration** command.

If no flow policy or interface is specified, statistics for all flow policies and interfaces are shown.

Examples

The following example shows the output for this command:

```
Router # show performance monitor status
Codes: *   - field is not configurable under flow record
       NA  - field is not applicable for configured parameters

Match: ipv4 src addr = 1.1.1.1, ipv4 dst addr = 7.7.7.2, ipv4 prot = udp, trns src port =
20001, trns dst port = 10000, SSRC = 4294967291
 Policy: RTP_POL, Class: RTP_CLASS, Interface: GigabitEthernet0/4, Direction: input


 *counter flow                                    : 7
  counter bytes                                   : 43560
  counter bytes rate                       (Bps)  : 311
 *counter bytes rate per flow              (Bps)  : 44
 *counter bytes rate per flow min          (Bps)  : 0
 *counter bytes rate per flow max          (Bps)  : 442
  counter packets                                 : 990
 *counter packets rate per flow                   : 1
  counter packets dropped                         : 0
  routing forwarding-status reason                : NA
  interface input                                 : NA
  interface output                                : NA
  monitor event                                   : NA
  ipv4 dscp                                       : NA
  ipv4 ttl                                        : NA
  application media bytes counter                 : 0
  application media packets counter               : 0
  application media bytes rate             (Bps)  : 169
 *application media bytes rate per flow    (Bps)  : 24
 *application media bytes rate per flow min (Bps)  : 0
 *application media bytes rate per flow max (Bps)  : 241
  application media packets rate           (pps)  : 7
  application media event                         : Stop
 *transport rtp flow count                        : 6
  transport rtp jitter mean                (usec) : 457
  transport rtp jitter minimum             (usec) : 3
  transport rtp jitter maximum             (usec) : 2031
 *transport rtp payload type                      : 31
  transport event packet-loss counter             : 0
 *transport event packet-loss counter min         : 0
 *transport event packet-loss counter max         : 0
  transport packets expected counter              : 990
  transport packets lost counter                  : 0
 *transport packets lost counter minimum          : 0
 *transport packets lost counter maximum          : 0
  transport packets lost rate               ( % ) : 0.00
```

```
*transport packets lost rate min              ( % ) : 0.00
*transport packets lost rate max              ( % ) : 0.00
*transport tcp flow count                           : 1
*transport round-trip-time sum               (msec) : 32
*transport round-trip-time samples                  : 1
 transport round-trip-time                   (msec) : 32
*transport round-trip-time min               (msec) : 32
*transport round-trip-time max               (msec) : 32
```

Table 16 describes the significant fields shown in the display.

Table 16 show performance monitor status Field Descriptions

Field	Description
counter flow	Number of flows collected.
counter bytes	Total number of bytes collected for all flows.
counter bytes rate	Average number of packets or bits (as configured) processed by the monitoring system per second during the monitoring interval for all flows.
counter bytes rate per flow	Average number of packets or bits (as configured) processed by the monitoring system per second during the monitoring interval for each flow.
counter bytes rate per flow min	Minimum threshold for the average number of packets or bits processed per second for each flow.
counter bytes rate per flow max	Maximum threshold for the average number of packets or bits processed per second for each flow.
counter packets	Total number of IP packets sent for all flows.
counter packets rate per flow	Number of IP packets sent for each flow.
counter packets dropped	IP packet drops by any intermediate system in any of the mionitored flows.

Table 16 show performance monitor status Field Descriptions (continued)

Field	Description
routing forwarding-status reason	Forwarding status is encoded using eight bits with the two most significant bits giving the status and the six remaining bits giving the reason code. Status is either unknown (00), Forwarded (10), Dropped (10) or Consumed (11). The following list shows the forwarding status values for each status category. **Unknown** • 0 **Forwarded** • Unknown 64 • Forwarded Fragmented 65 • Forwarded not Fragmented 66 **Dropped** • Unknown 128, • Drop ACL Deny 129, • Drop ACL drop 130, • Drop Unroutable 131, • Drop Adjacency 132, • Drop Fragmentation & DF set 133, • Drop Bad header checksum 134, • Drop Bad total Length 135, • Drop Bad Header Length 136, • Drop bad TTL 137, • Drop Policer 138, • Drop WRED 139, • Drop RPF 140, • Drop For us 141, • Drop Bad output interface 142, • Drop Hardware 143, **Consumed** • Unknown 192, • Terminate Punt Adjacency 193, • Terminate Incomplete Adjacency 194, • Terminate For us 195
interface out	Outgoing interface index.

Table 16 show performance monitor status Field Descriptions (continued)

Field	Description
interface in	Incoming interface index.
monitor event	Bit 1 indicates that one of the thresholds specified by a react statement for the flow was crossed at least once in the monitoring interval. Bit 2 indicates that there was a loss-of-confidence in measurement.
ipv4 dscp	IPv4 differentiated services code point (DCSP).
ipv4 ttl	IPv4 time-to-live (TTL).
application media bytes counter	Number of IP bytes from by media applications received for a specific media stream.
application media packets counter	Number of IP packets produced from media applications received for a specific media stream.
application media bytes rate	Average media bit rate (bps) for all flows during the monitoring interval.
application media bytes rate per flow	Average media bit rate (bps) for each flow during the monitoring interval.
application media bytes rate per flow min	Minimum threshold for the rate of application media bytes, in Bps, collected per flow.
application media bytes rate per flow max	Maximum threshold for the rate of application media bytes, in Bps, collected per flow.
application media event	Bit 1 is not used. Bit 2 indicates that no media application packets were seen, in other words, a Media Stop Event occured.
transport rtp flow count	Number of RTP flows collected.
transport rtp jitter mean	Mean deviation of the difference in packet spacing at the receiver compared to the sender for a pair of packets.
transport rtp jitter minimum	Minimum threshold for the deviation of the difference in packet spacing at the receiver compared to the sender for a pair of packets.
transport rtp jitter maximum	Maximum threshold for the deviation of the difference in packet spacing at the receiver compared to the sender for a pair of packets.
transport rtp payload type	Code for the payload format. Payload type codes can be defined dynamically or codes for default audio and video format can be used as defined in RFC 3551. An RTP source can change the payload type during a session, but a receiver MUST ignore packets with payload types that it does not understand. Therefore, some measurements taken during monitoring may not be accurate.
transport event packet-loss counter	Number of loss events (number of contiguous sets of lost packets).
transport event packet-loss counter min	Minimum threshold for the number of packet loss events.
transport event packet-loss counter max	Maximum threshold for the number of packet loss events.
transport packets expected counter	Number of packets expected.

Table 16 show performance monitor status Field Descriptions (continued)

Field	Description
transport packets lost counter	Number of packets lost.
transport packets lost counter minimum	Minimum threshold for the number of packets lost.
transport packets lost counter maximum	Maximum threshold for the number of packets lost.
transport packets lost rate	Rate of packets lost, in percent .
transport packets lost rate min	Minimum threshold for the percent of packets lost.
transport packets lost rate max	Maximum threshold for the percent of packets lost.
transport tcp flow count	Number of the flow collected.
transport round-trip-time sum	Total of all round-trip-times.
transport round-trip-time samples	Number of round-trip-time samples
transport round-trip-time	Average of all round-trip-times.
transport round-trip-time min	Smallest of all round-trip-times.
transport round-trip-time max	Largest of all round-trip-times.

Related Commands

Command	Description
show performance monitor history	Displays historical sets of statistics collected by Performance Monitor.

show policy-map type performance-monitor

To display policy-map statistics for Performance Monitor, use the **show policy-map type performance-monitor** command in privileged EXEC mode.

show policy-map type performance-monitor[**interface** *interface-name*] [**class** *class-name*] [**input** | **output**]

Syntax Description

interface *interface-name*	Show statistics for the specified interface. If no interface is specified, show statistics for all interface associated with a performance-monitor policy-map.
class *class-name*	Show statistics only for the specified class.
input	Show input statistics for the interface.
output	Show output statistics for the interface.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

If no interface or class is specified, statistics for all interfaces and classes associated with a performance-monitor policy-map are shown.

Examples

The following example shows the output for this command for one Flow Policy::

```
Router # show policy-map type performance-monitor
Policy Map type performance-monitor PM-POLICY-4
    Class PM-CLASS-4
      flow monitor PM-MONITOR-4
        record PM-RECORD-4
        exporter PM-EXPORTER-4
      monitor parameters
        interval duration 30
        timeout 10
        history 10
        flows 8000
      monitor metric rtp
        min-sequential 5
        max-dropout 5
        max-reorder 5
        clock-rate default 90000
        ssrc maximum 5
```

Table 17 describes the significant fields shown in the display.

Table 17 show policy-map type performance-monitor Field Descriptions

Field	Description
Policy Map type performance-monitor	Name of the Performance Monitor Flow Policy.
flow monitor	Name of the Performance Monitor Flow Monitor.
record	Name of the Performance Monitor Flow Record.
exporter	Name of the Performance Monitor Flow Exporter.
monitor parameter	Parameters for the Flow Policy.
interval duration	The configured duration of the collection interval for the policy.
timeout	The configured amount of time wait for a response when collecting data for the policy.
history	The configured number of historical collections to keep for the policy.
flows	The configured number of flows to collect for the policy.
monitor metric rtp	RTP metrics for the Flow Policy.
min-sequential	The configured mimimum number of packets in a sequence used to classify an RTP flow.
max-dropout	The configured maximum number of packets to ignore ahead of the current packet in terms of sequence number.
max-reorder	The configured maximum number of packets to ignore behind the current packet in terms of sequence number.
clock-rate default	The configured clock rate for the RTP packet timestamp clock that is used to calculate the packet arrival latency.
ssrc maximum	The configured maximum number of SSRCs that can be monitored within same flow (as defined by the protocol, source/destination address, source/destination port). The range is from 1 to 50.

Related Commands

Command	Description
policy-map type performance-monitor	Creates a policy for Performance Monitor.

source (Flexible NetFlow)

To configure the source IP address interface for all of the packets sent by a flow exporter for Flexible NetFlow or Performance Monitor, use the **source** command in flow exporter configuration mode. To remove the source IP address interface for all of the packets sent by a 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 flow exporter.
interface-number	Interface number whose IP address you want to use for the source IP address of the packets sent by a flow exporter.

Command Default

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

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 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.
Cisco IOS XE Release 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
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.

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 or Performance Monitor is used by the destination system to determine from which router the Flexible NetFlow or Performance Monitor data is arriving. If your network has two or more paths that can be used to send Flexible

NetFlow or Performance Monitor 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 or Performance Monitor datagrams from the same router, but with different source IP addresses. When the destination system receives Flexible NetFlow or Performance Monitor datagrams from the same router with different source IP addresses, the destination system treats the datagrams as if they were being sent from different routers. To avoid having the destination system treat the datagrams as if they were being sent from different routers, you must configure the destination system to aggregate the datagrams it receives from all of the possible source IP addresses in the router into a single 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 or Performance Monitor 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 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 or Performance Monitor 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 or Performance Monitor 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.

ssrc maximum

To configure the SSRC maximum metrics for a Performance Monitor policy, use the **ssrc maximum** command in policy RTP configuration mode. To remove the configuration, use the **no** form of this command.

ssrc maximum *number*

no monitor ssrc maximum *number*

Syntax Description

number	Specifies the maximum number of SSRCs that can be monitored within same flow (as defined by the protocol, source/destination address, source/destination port). The range is from 1 to 50.

Command Default

Maximum number of SSRC sessions is 10.

Command Modes

Policy RTP configuration (config-pmap-c-mrtp)
Policy inline RTP configuration (config-spolicy-inline-mrtp)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Usage Guidelines

It is not recommended that you limit the maximum number of SSRCs that can be monitored within same flow by using the **ssrc maximum** keyword**.** The flow engine will not learn new SSRC sessions once the maximum number is meet until a discovered flow is removed. Setting the value high will help to avoid the unexpected denial-of-service attacks.

Examples

The following example shows how to set the SSRC maximum, while configuring a policy-map:

```
Router(config)# policy-map type performance-monitor policy-4
Router(config-pmap)# class PM-CLASS-4
Router(config-pmap-c)# monitor metric rtp
Router(config-pmap-c-mrtp)# ssrc maximum 40
```

The following example shows how to set the SSRC maximum, while associating a service-policy with an interface:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# monitor metric rtp
Router(config-spolicy-inline-mrtp)# ssrc maximum 40
```

Related Commands

Command	Description
policy-map type performance-monitor	Creates a policy for Performance Monitor.
service-policy type performance-monitor	Associates a policy with an interface.

template data timeout

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

template data timeout *seconds*

no template data timeout

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

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 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 Release 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
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.

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.

threshold value (policy react and policy inline react)

To configure the threshold that determines whether alarms are sent for a Performance Monitor policy, use the **threshold value** command in policy configuration mode and policy inline react configuration mode. To remove the threshold setting, use the **no** form of this command.

threshold value {**ge** *number* | **gt** *number* | **le** *number* | **lt** *number* | **range** *rng-start rng-end*}

no threshold value {**ge** *number* | **gt** *number* | **le** *number* | **lt** *number* | **range** *rng-start rng-end*}

Syntax Description

ge *number*	Send alarms if the value is greater than or equal to threshold.
gt *number*	Send alarms if the value is greater than threshold.
le *number*	Send alarms if the value is less than or equal to threshold.
lt *number*	Send alarms if the value is less than threshold.
range *rng-start rng-end*	Send alarms if the value is within the specified range of the threshold.

Command Default

no thresholds are set.

Command Modes

Policy react configuration (config-pmap-c-react)
Policy inline react configuration (config-spolicy-inline-react)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Examples

The following example shows how to specify that alarms are sent if a value exceeds a threshold of 20, while configuring a policy-map:

```
Router(config)# policy-map type performance-monitor policy-4
Router(config-pmap)# class PM-CLASS-4
Router(config-pmap-c)# react 2000 rtp-jitter-average
Router(config-pmap-c-react)# threshold gt 20
```

The following example shows how to specify that alarms are sent if a value exceeds a threshold of 20, while associating a service-policy with an interface:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# react 2000 rtp-jitter-average
Router(config-spolicy-inline-react)# threshold gt 20
```

Related Commands

Command	Description
policy-map type performance-monitor	Creates a policy for Performance Monitor.
service-policy type performance-monitor	Associates a policy with an interface.

timeout (monitor parameters)

To configure the amount of time to wait before a stopped flow is removed from the Performance Monitor database, use the **monitor parameters** command in monitor parameters configuration mode. To remove the configuration, use the **no** form of this command.

timeout *number*

no timeout

Syntax Description

timeout *number*	Specifies the number of intervals before a stopped flow is removed from the database.

Command Default

Timeout is 10 intervals.

Command Modes

Monitor parameters configuration (config-pmap-c-mparam)
Inline monitor parameters configuration (config-spolicy-inline-mparam)

Command History

Release	Modification
15.1(3)T	This command was introduced.
12.2(58)SE	This command was integrated into Cisco IOS Release 12.2(58)SE.

Examples

The following example shows how to set the amount of time wait for a response when collecting data to 20 intervals, while configuring a policy-map:

```
Router(config)# policy-map type performance-monitor policy-4
Router(config-pmap)# class PM-CLASS-4
Router(config-pmap-c)# monitor parameters
Router(config-pmap-c-mparam)# timeout 20
```

The following example shows how to set the amount of time wait for a response when collecting data to 20 intervals, while associating a service-policy with an interface:

```
Router(config)# interface ethernet 0/0
Router(config-if)# service-policy type performance-monitor inline input
Router(config-if-spolicy-inline)# monitor parameters
Router(config-spolicy-inline-mparam)# timeout 20
```

Related Commands

Command	Description
policy-map type performance-monitor	Creates a policy for Performance Monitor.
policy-map type performance-monitor	Creates a policy for Performance Monitor.

transport (Flexible NetFlow)

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

transport udp *udp-port*

no transport

Syntax Description

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

Command Default

Flow exporters use UDP on port 9995.

Command Modes

flow exporter configuration (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 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.
Cisco IOS XE Release 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
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.

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 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

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 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.
Cisco IOS XE Release 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
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.

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.