VYATTA, INC. | Vyatta System

QoS

REFERENCE GUIDE

QoS

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Quick List of Commands

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List of Examples

Use this list to help you locate examples you'd like to look at or try.

Example 3-1 "show incoming": Displaying all incoming packet actions. 25
Example 3-2 "show queueing": Displaying all outgoing QoS policies. 26
Example 3-3 "show queueing ethernet eth0": Displaying QoS policies on a specific interface. 27

Preface

This document describes the various deployment, installation, and upgrade options for Vyatta software.

This preface provides information about using this guide. The following topics are presented:

- Intended Audience
- Organization of This Guide
- Document Conventions
- Vyatta Publications

Intended Audience

This guide is intended for experienced system and network administrators. Depending on the functionality to be used, readers should have specific knowledge in the following areas:

- Networking and data communications
- TCP/IP protocols
- General router configuration
- Routing protocols
- Network administration
- Network security
- IP services

Organization of This Guide

This guide has the following aid to help you find the information you are looking for:

- Quick List of Commands

  Use this list to help you quickly locate commands.

- List of Examples

  Use this list to help you locate examples you'd like to try or look at.

This guide has the following chapters:

Chapter	Description	Page
Chapter 1: QoS Overview	This chapter provides a brief overview of quality of service (QoS) features on the Vyatta system.	1
Chapter 2: QoS Configuration Examples	This chapter provides configuration examples for implementing quality of service (QoS) on the Vyatta system.	6
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Document Conventions

This guide uses the following advisory paragraphs, as follows.

WARNING *Warnings alert you to situations that may pose a threat to personal safety.*

CAUTION *Cautions alert you to situations that might cause harm to your system or damage to equipment, or that may affect service.*

NOTE *Notes provide information you might need to avoid problems or configuration errors.*

This document uses the following typographic conventions.

`Monospace`	Examples, command-line output, and representations of configuration nodes.
`bold Monospace`	Your input: something you type at a command line.
bold	Commands, keywords, and file names, when mentioned inline. Objects in the user interface, such as tabs, buttons, screens, and panes.
italics	An argument or variable where you supply a value.
<key>	A key on your keyboard, such as <Enter>. Combinations of keys are joined by plus signs (“+”), as in <Ctrl>+c.
[key1 | key2]	Enumerated options for completing a syntax. An example is [enable | disable].
num1–numN	A inclusive range of numbers. An example is 1–65535, which means 1 through 65535, inclusive.
arg1..argN	A range of enumerated values. An example is eth0..eth3, which means eth0, eth1, eth2, or eth3.
arg[*arg*...] *arg*[,*arg*...]	A value that can optionally represent a list of elements (a space-separated list and a comma-separated list, respectively).

Vyatta Publications

Full product documentation is provided in the Vyatta technical library. To see what documentation is available for your release, see the *Guide to Vyatta Documentation*. This guide is posted with every release of Vyatta software and provides a great starting point for finding the information you need.

Additional information is available on www.vyatta.com and www.vyatta.org.

Chapter 1: QoS Overview

This chapter provides a brief overview of quality of service (QoS) features on the Vyatta system.

This chapter presents the following topics:

- QoS Mechanisms
- Default Traffic Prioritization
- Traffic Policies

QoS Mechanisms

Quality of Service (QoS) is a feature that allows network administrators to identify different traffic flows and then treat them according to their individual requirements, rather than simply using the default mechanism.

On the Vyatta system the default QoS mechanism is based on queue prioritization. In addition to the default queuing mechanism, the Vyatta system provides a variety of QoS mechanisms for identifying and treating the various traffic flows that pass through an interface. In general, these can be categorized as mechanisms that apply to outbound traffic and mechanisms that apply to inbound traffic.

The general workflow for non-default QoS mechanisms (traffic policies) is as follows:

1. Create a traffic policy (traffic-policy). The policy identifies traffic flows and specifies how each flow is to be treated.
2. Apply the policy to an interface.

Default Traffic Prioritization

By default, all traffic sent out by the Vyatta system is prioritized based on the value in its Type of Service (ToS) field into one of three priority queues. The packets on the highest priority queue are sent out first, followed by those on the next-highest priority queue, followed by those on the lowest priority queue. Within each queue, all packets are sent on a First In First Out (FIFO) basis and receive "best effort" delivery. If traffic arrives on a queue faster than it can be delivered (for example, because of bandwidth limitations) it is buffered within the system. If more data arrives than the system can buffer, the excess is dropped.

Data traffic is divided in this way because providing equal levels of service for all traffic is not always desirable. Some types of traffic, by their nature, should be treated differently than others. For example, voice traffic is very sensitive to delay and, if it is not processed accordingly, may be unintelligible. Data, on the other hand, is sensitive not to delay but to corruption.

Traffic Policies

The following table shows the traffic policies supported by the Vyatta system and whether they can be applied to inbound traffic or outbound traffic:

Traffic policy	Inbound	Outbound
Drop-Tail	-	Yes
Fair Queue	-	Yes
Round-Robin	-	Yes
Traffic Shaper	-	Yes
Rate Control	-	Yes
Random Detect	-	Yes
Network Emulator	-	Yes
Traffic Limiter	Yes	-

Drop-Tail

The **"traffic-policy drop-tail"** mechanism is a scheduling algorithm. It provides pure FIFO (First In First Out) queuing; in other words, data packets are transmitted in the same order that they arrive. If the queue fills up, then the "tail" of the queue (that is, the set of packets just arriving in the queue) is dropped. With drop-tail queuing, there is a single queue and all traffic is treated equally; traffic is not prioritized as it is in the default case.

Fair Queue

The **"traffic-policy fair-queue"** mechanism is a scheduling algorithm. It provides queuing based on the Stochastic Fairness Queuing algorithm. In this queuing algorithm, traffic flows are identified by IP protocol, source address, and/or destination address. Flows thus identified receive fair access to network resources such that no one flow is permitted to use the majority of the bandwidth.

Round-Robin

The **"traffic-policy round-robin"** mechanism is a simple scheduling algorithm. In round-robin queueing, classes of traffic are identified and bandwidth is divided equally among the defined classes.

Traffic Shaper

The **"traffic-policy shaper"** mechanism provides queuing based on the Token Bucket shaping algorithm. This algorithm allows for bursting if a "bucket" has tokens to "spend." The difference between the **shaper** and **round-robin** algorithms is that the **shaper** algorithm limits bandwidth usage by class and then allocates any leftover bandwidth. **Round-robin**, on the other hand, attempts to divide all available bandwidth equally between the defined classes.

Rate Control

The **"traffic-policy rate-control"** mechanism is a scheduling algorithm. It provides queuing based on the Token Bucket Filter algorithm. This algorithm only passes packets arriving at a rate which does not exceed an administratively set rate. It is possible, however, for short bursts of traffic to occur in excess of this rate.

Random Detect

The **"traffic-policy random-detect"** mechanism is a congestion avoidance mechanism that includes Random Early Detection (RED) and Weighted Random Early Detection (WRED).

Congestion occurs when output buffers are allowed to fill such that packets must be dropped. Congestion can cause global resyncronization of TCP hosts as multiple hosts reduce their transmission rates to try to clear the congestion; this can significantly affect network performance. As congestion clears, the network increases transmission rates again until the point where congestion reoccurs. This cycle of congestion and clearing does not make the best use of the available bandwidth.

RED reduces the chance that network congestion will occur by randomly dropping packets when the output interface begins to show signs of congestion. The packet-dropping as a signal to the source to decrease its transmission rate which, in turn, helps avoid conditions of congestion and reduces the chance of global synchronization, making better use of network bandwidth.

WRED takes RED one step further by providing a way to attach precedence to different traffic streams. Differential quality of service can then be provided to different traffic streams by dropping more packets from some streams than from others.

Network Emulator

The **"traffic-policy network-emulator"** mechanism provides a way to emulate WAN traffic. It is typically used for system testing.

Traffic Limiter

The **"traffic-policy limiter"** mechanism can be used to throttle (or "police") incoming traffic. The mechanism assigns each traffic flow a bandwidth limit. All incoming traffic within a flow in excess of the bandwidth limit is dropped. The advantages are that this policy does not incur queuing delay and it is the only policy that can be appied to inbound traffic. The disadvantage is that it is more likely to drop packets and cause retransmissions. **Shaper** or **rate-control** are typically used to throttle outgoing traffic where queuing delays can be tolerated. They will buffer traffic in excess of the bandwidth limit and will not drop packets unless the buffers overflow.

Chapter 2: QoS Configuration Examples

This chapter provides configuration examples for implementing quality of service (QoS) on the Vyatta system.

This chapter presents the following topics:

- Outbound Example - Traffic Shaping
- Inbound Example - Traffic Limiting
- Inbound Example - Controlling Bandwidth Across Multiple Interfaces

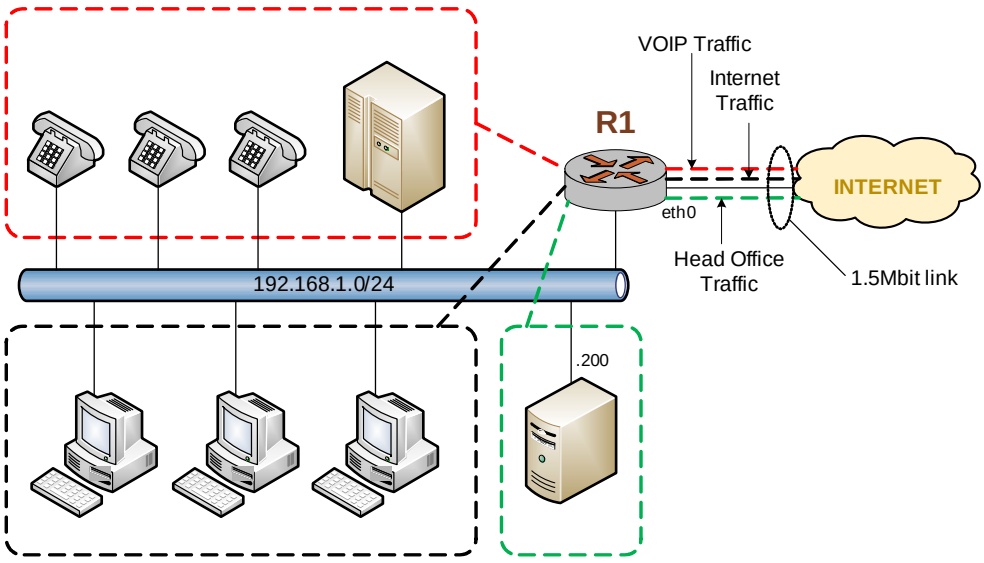
Outbound Example - Traffic Shaping

Figure 2-1 shows a simple site using QoS on the Vyatta system (R1) to treat three distinct traffic flows in different ways. This scenario represents a single branch office with a Voice over IP (VoIP) phone system, users that connect to the Internet, and a server that requires a relatively high-speed connection to head office. In this example:

- All traffic flows through a 1.5 Mbit link to the Internet Service Provider (ISP).
- A minimum 50% of this bandwidth is to be set aside for the VoIP traffic, 35% for the head office traffic, and 15% for all other traffic.
- All traffic flows will use available bandwidth beyond their minimum configured rates.
- In addition, the VoIP traffic is to be categorized into two distinct flows:
  - 5% of bandwidth is to be used for control traffic (in the example, Session Initiation Protocol [SIP] signals for setting up calls).
  - 45% of bandwidth is to be used for Real Time Protocol (RTP) media.

  The different flows are identified by their Differentiated Services Code Point (DSCP) values: SIP traffic is assigned a DSCP value of 26 and RTP traffic is assigned a DSCP value of 46.)
- The head office traffic arrives from a single server at IP address 192.168.1.200.

Figure 2-1 Example VoIP site using QoS



To configure this scenario, perform the following steps in configuration mode.

Example 2-1 Traffic shaping

Step	Command
Create the configuration node for the QoS policy.	vyatta@R1#**set traffic-policy shaper OFFICE**
Add a description.	vyatta@R1#**set traffic-policy shaper OFFICE description "QoS policy for office WAN"**
Set the overall link bandwidth.	vyatta@R1#**set traffic-policy shaper OFFICE bandwidth 1500kbit**
Add a description for the first traffic class - VOIP data traffic.	vyatta@R1#**set traffic-policy shaper OFFICE class 10 description "VOIP - RTP traffic"**
Assign bandwidth to the VOIP data traffic.	vyatta@R1#**set traffic-policy shaper OFFICE class 10 bandwidth 45%**
Allow the VOIP data traffic to use all available bandwidth.	vyatta@R1#**set traffic-policy shaper OFFICE class 10 ceiling 100%**
Identify the VOIP data traffic (DSCP=46).	vyatta@R1#**set traffic-policy shaper OFFICE class 10 match VOIP-RTP ip dscp 46**
Add a description for the second traffic class - VOIP control traffic.	vyatta@R1#**set traffic-policy shaper OFFICE class 20 description "VOIP -SIP traffic"**
Assign bandwidth to the VOIP control traffic.	vyatta@R1#**set traffic-policy shaper OFFICE class 20 bandwidth 5%**
Allow the VOIP control traffic to use all available bandwidth.	vyatta@R1#**set traffic-policy shaper OFFICE class 20 ceiling 100%**
Identify the VOIP control traffic (DSCP=26).	vyatta@R1#**set traffic-policy shaper OFFICE class 20 match VOIP-SIP ip dscp 26**
Add a description for the third traffic class - head office traffic.	vyatta@R1#**set traffic-policy shaper OFFICE class 30 description "Head office traffic"**
Assign bandwidth to the head office traffic.	vyatta@R1#**set traffic-policy shaper OFFICE class 30 bandwidth 35%**
Allow the head office traffic to use all available bandwidth.	vyatta@R1#**set traffic-policy shaper OFFICE class 30 ceiling 100%**
Identify the head office traffic (IP address=192.168.1.200/24).	vyatta@R1#**set traffic-policy shaper OFFICE class 30 match HO-TRAFFIC ip source address 192.168.1.200/24**
Assign bandwidth to the remainder of the traffic.	vyatta@R1#**set traffic-policy shaper OFFICE default bandwidth 15%**

Example 2-1 Traffic shaping

Allow the default traffic to use all available bandwidth.	vyatta@R1#**set traffic-policy shaper OFFICE default ceiling 100%**
Commit the change.	vyatta@R1#**commit**

Show the traffic-policy configuration.	vyatta@R1#**show traffic-policy**
	shaper OFFICE {
	bandwidth 1500kbit
	class 10 {
	bandwidth 45%
	ceiling 100%
	description “VOIP - RTP traffic”
	match VOIP-RTP {
	ip {
	dscp 46
	}
	}
	}
	class 20 {
	bandwidth 5%
	ceiling 100%
	description “VOIP - SIP traffic”
	match VOIP-SIP {
	ip {
	dscp 26
	}
	}
	}
	class 30 {
	bandwidth 35%
	ceiling 100%
	description “Head office traffic”
	match HO-TRAFFIC {
	ip {
	source {
	address 192.168.1.200/24
	}
	}
	}
	}
	default {
	bandwidth 15%
	ceiling 100%
	}
	description “QoS policy for office WAN”
	}

Example 2-1 Traffic shaping

Assign the QoS policy to the upstream interface.	`vyatta@R1#set interfaces ethernet eth0 traffic-policy out OFFICE`

Inbound Example - Traffic Limiting

In this example inbound mail traffic (port 25) on eth0 is limited to 300kbit/sec.

To configure this scenario, perform the following steps in configuration mode.

Example 2-2 Traffic limiting

Step	Command
Create the configuration node for the QoS policy.	`vyatta@R1#set traffic-policy limiter LIMIT-MAIL`
Add a description for the traffic class - Mail traffic.	`vyatta@R1#set traffic-policy limiter LIMIT-MAIL class 10 description “Limit inbound mail traffic”`
Assign bandwidth to the Mail data traffic.	`vyatta@R1#set traffic-policy limiter LIMIT-MAIL class 10 bandwidth 300kbit`
Identify the Mail data traffic (port=25).	`vyatta@R1#set traffic-policy limiter LIMIT-MAIL class 10 match MAIL-TRAFFIC ip destination port 25`
Commit the change.	`vyatta@R1#commit`

Show the traffic-policy configuration.	`vyatta@R1#show traffic-policy`
	`limiter LIMIT-MAIL {`
	`  class 10 {`
	`  bandwidth 300kbit`
	`  description “Limit inbound mail traffic”`
	`  match MAIL-TRAFFIC {`
	`  ip {`
	`  destination {`
	`  port 25`
	`  }`
	`  }`
	`  }`
	`  }`
	`}`

Assign the QoS policy to inbound traffic on eth0.	`vyatta@R1#set interfaces ethernet eth0 traffic-policy in LIMIT-MAIL`

Inbound Example - Controlling Bandwidth Across Multiple Interfaces

In this example the combined inbound traffic from eth0, eth1, and eth2 is not to exceed 1Gbit/sec. To do this, inbound traffic from these interfaces is redirected to Input interface ifb0. A rate control policy to limit traffic to 1Gbit/sec is created and is assigned to ifb0.

To configure this scenario, perform the following steps in configuration mode.

Example 2-3 Traffic limiting across multiple interfaces

Step	Command
Redirect eth0 traffic to input interface ifb0.	`vyatta@R1#set interfaces ethernet eth0 redirect ifb0`
Redirect eth1 traffic to input interface ifb0.	`vyatta@R1#set interfaces ethernet eth1 redirect ifb0`
Redirect eth2 traffic to input interface ifb0.	`vyatta@R1#set interfaces ethernet eth2 redirect ifb0`
Create the configuration node for the QoS policy.	`vyatta@R1#set traffic-policy rate-control LIMIT-1Gbit`
Add a description for the policy.	`vyatta@R1#set traffic-policy rate-control LIMIT-1Gbit description “Limit traffic to 1Gbit”`
Assign a bandwidth limit to the traffic.	`vyatta@R1#set traffic-policy rate-control LIMIT-1Gbit bandwidth 1gbit`
Commit the change.	`vyatta@R1#commit`

Show the traffic-policy configuration.	`vyatta@R1#show traffic-policy`
	` rate-control LIMIT-1Gbit {`
	`  bandwidth 1gbit`
	`  description “Limit traffic to 1Gbit”`
	` }`

Assign the QoS policy to outbound traffic on ifb0 (which will be the combined traffic from eth0, eth1, and eth2). Outbound traffic from an input interface is internal to the Vyatta device.	`vyatta@R1#set interfaces input ifb0 traffic-policy out LIMIT-1Gbit`

Chapter 3: QoS Commands

This chapter describes commands for QoS features supported by the Vyatta system.

This chapter contains the following commands.

Configuration Commands	
Applying QoS Policies to Interfaces	
interfaces <interface> traffic-policy	Applies a QoS policy to the specified interface.
Outbound - Drop Tail Policies	
traffic-policy drop-tail <policy-name>	Defines a drop tail (pure FIFO) QoS policy.
traffic-policy drop-tail <policy-name> description <desc>	Sets a description for a drop tail policy.
traffic-policy drop-tail <policy-name> queue-limit <limit>	Sets an upper bound for the number of packets allowed in the queue for a drop tail policy.
Outbound - Fair Queue Policies	
traffic-policy fair-queue <policy-name>	Defines a fair queue QoS policy.
traffic-policy fair-queue <policy-name> description <desc>	Sets a description for a fair queue policy.
traffic-policy fair-queue <policy-name> hash-interval <seconds>	Specifies the interval between flow hash function updates for a fair queue policy.
traffic-policy fair-queue <policy-name> queue-limit <limit>	Sets an upper bound for the number of packets allowed in the queue for a fair queue policy.
Inbound - Limiter Policies	
traffic-policy limiter <policy-name>	Defines a traffic limiter QoS policy.
traffic-policy limiter <policy-name> description <desc>	Specifies a description for a traffic limiter QoS policy.
Inbound - Limiter Policy Classes	
traffic-policy limiter <policy-name> class <class>	Defines a traffic class for a traffic limiter QoS policy.
traffic-policy limiter <policy-name> class <class> bandwidth	Specifies the bandwidth rate cap for a traffic class.
traffic-policy limiter <policy-name> class <class> burst	Sets the burst size for a traffic class.
traffic-policy limiter <policy-name> class <class> description <desc>	Sets a description for a traffic class.
traffic-policy limiter <policy-name> class <class> match <match-name>	Defines a traffic class matching rule.
traffic-policy limiter <policy-name> class <class> match <match-name> description <desc>	Sets a description for a match rule.

traffic-policy limiter <policy-name> class <class> match <match-name> ether destination <mac-addr>	Specifies a match criterion based on Ethernet destination (MAC) address.
traffic-policy limiter <policy-name> class <class> match <match-name> ether protocol <num>	Specifies a match criterion based on Ethernet packet type.
traffic-policy limiter <policy-name> class <class> match <match-name> ether source <mac-addr>	Specifies a match criterion based on Ethernet source (MAC) address.
traffic-policy limiter <policy-name> class <class> match <match-name> ip destination	Specifies a match criterion based on IP destination information.
traffic-policy limiter <policy-name> class <class> match <match-name> ip dscp <value>	Specifies a match criterion based on the value of the DSCP field.
traffic-policy limiter <policy-name> class <class> match <match-name> ip protocol <proto>	Specifies a match criterion based on the IP protocol.
traffic-policy limiter <policy-name> class <class> match <match-name> ip source	Specifies a match criterion based on source IP information.
traffic-policy limiter <policy-name> class <class> match <match-name> ipv6 destination	Specifies a match criterion based on IPv6 destination information.
traffic-policy limiter <policy-name> class <class> match <match-name> ipv6 dscp <value>	Specifies a match criterion based on the value of the DSCP field.
traffic-policy limiter <policy-name> class <class> match <match-name> ipv6 protocol <proto>	Specifies a match criterion based on the IPv6 protocol.
traffic-policy limiter <policy-name> class <class> match <match-name> ipv6 source	Specifies a match criterion based on source IPv6 information.
traffic-policy limiter <policy-name> class <class> match <match-name> vif <vlan-id>	Specifies a match criterion based on VLAN ID.
traffic-policy limiter <policy-name> class <class> priority <priority>	Specifies the order of evaluation of matching rules.
Inbound - Limiter Policy Default Class	
traffic-policy limiter <policy-name> default	Defines a default traffic class for a traffic limiter QoS policy.
traffic-policy limiter <policy-name> default bandwidth	Specifies the bandwidth rate cap for the default traffic class.
traffic-policy limiter <policy-name> default burst	Sets the burst size for the default traffic class.
traffic-policy limiter <policy-name> default priority <priority>	Specifies the order of evaluation of matching rules for the default traffic class.

Outbound - Network Emulator Policies	
traffic-policy network-emulator <policy-name>	Defines a network emulator QoS policy.
traffic-policy network-emulator <policy-name> bandwidth	Specifies the bandwidth limit for all combined traffic constrained by this policy.
traffic-policy network-emulator <policy-name> burst	Sets the burst size for a network emulation QoS policy.
traffic-policy network-emulator <policy-name> description <desc>	Sets a description for a network emulator policy.
traffic-policy network-emulator <policy-name> network-delay	Sets the amount of delay between packets for a network emulation QoS policy.
traffic-policy network-emulator <policy-name> packet-corruption <percent>	Sets the percentage of packets to corrupt in a network emulation QoS policy.
traffic-policy network-emulator <policy-name> packet-loss <percent>	Sets the percentage of packets to drop in a network emulation QoS policy.
traffic-policy network-emulator <policy-name> packet-reordering <percent>	Sets the percentage of packets to reorder in a network emulation QoS policy.
traffic-policy network-emulator <policy-name> queue-limit <limit>	Sets an upper bound for the number of packets allowed in the queue for a network emulation QoS policy.
Outbound - Random Detect Policies	
traffic-policy random-detect <policy-name>	Defines a Weighted Random Early Detection (WRED) QoS policy.
traffic-policy random-detect <policy-name> bandwidth	Specifies the bandwidth limit for all combined traffic constrained by this policy.
traffic-policy random-detect <policy-name> description <desc>	Sets a description for a random-detect policy.
traffic-policy random-detect <policy-name> precedence <precedence>	Sets parameters for dropping packets based on precedence for a random-detect policy.
Outbound - Rate Control Policies	
traffic-policy rate-control <policy-name>	Defines a rate controlling QoS policy.
traffic-policy rate-control <policy-name> bandwidth	Specifies the bandwidth limit for all combined traffic constrained by this policy.
traffic-policy rate-control <policy-name> burst	Sets the burst size for a rate controlling QoS policy.
traffic-policy rate-control <policy-name> description <desc>	Sets a description for a rate controlling policy.

traffic-policy rate-control <policy-name> latency	Sets the limit on queue size based on latency for a rate controlling QoS policy.
Outbound - Round Robin Policies	
traffic-policy round-robin <policy-name>	Defines a round robin QoS policy.
traffic-policy round-robin <policy-name> description <desc>	Specifies a description for a round-robin QoS policy.
Outbound - Round Robin Policy Classes	
traffic-policy round-robin <policy-name> class <class>	Defines a traffic class for a round robin QoS policy.
traffic-policy round-robin <policy-name> class <class> description <desc>	Sets a description for a traffic class.
traffic-policy round-robin <policy-name> class <class> match <match-name>	Defines a traffic class matching rule.
traffic-policy round-robin <policy-name> class <class> match <match-name> description <desc>	Sets a description for a match rule.
traffic-policy round-robin <policy-name> class <class> match <match-name> ether destination <mac-addr>	Specifies a match criterion based on Ethernet destination (MAC) address.
traffic-policy round-robin <policy-name> class <class> match <match-name> ether protocol <num>	Specifies a match criterion based on Ethernet packet type.
traffic-policy round-robin <policy-name> class <class> match <match-name> ether source <mac-addr>	Specifies a match criterion based on Ethernet source (MAC) address.
traffic-policy round-robin <policy-name> class <class> match <match-name> interface <interface>	Specifies a match criterion based on incoming interface.
traffic-policy round-robin <policy-name> class <class> match <match-name> ip destination	Specifies a match criterion based on IP destination information.
traffic-policy round-robin <policy-name> class <class> match <match-name> ip dscp <value>	Specifies a match criterion based on the value of the DSCP field.
traffic-policy round-robin <policy-name> class <class> match <match-name> ip protocol <proto>	Specifies a match criterion based on the IP protocol.
traffic-policy round-robin <policy-name> class <class> match <match-name> ip source	Specifies a match criterion based on source IP information.
traffic-policy round-robin <policy-name> class <class> match <match-name> ipv6 destination	Specifies a match criterion based on IPv6 destination information.
traffic-policy round-robin <policy-name> class <class> match <match-name> ipv6 dscp <value>	Specifies a match criterion based on the value of the DSCP field.

traffic-policy round-robin <policy-name> class <class> match <match-name> ipv6 protocol <proto>	Specifies a match criterion based on the IPv6 protocol.
traffic-policy round-robin <policy-name> class <class> match <match-name> ipv6 source	Specifies a match criterion based on source IPv6 information.
traffic-policy round-robin <policy-name> class <class> match <match-name> vif <vlan-id>	Specifies a a match criterion based on VLAN ID.
traffic-policy round-robin <policy-name> class <class> quantum <packets>	Specifies the number of packets that can be sent per scheduling quantum for a traffic class.
traffic-policy round-robin <policy-name> class <class> queue-limit <limit>	Specifies the maximum queue size for a traffic class.
traffic-policy round-robin <policy-name> class <class> queue-type <type>	Specifies the type of queuing to use for a traffic class.
Outbound - Round Robin Policy Default Class	
traffic-policy round-robin <policy-name> default	Defines a default round robin QoS policy.
traffic-policy round-robin <policy-name> default quantum <packets>	Specifies the number of packets that can be sent per scheduling quantum.
traffic-policy round-robin <policy-name> default queue-limit <limit>	Specifies the maximum queue size for the default traffic class.
traffic-policy round-robin <policy-name> default queue-type <type>	Specifies the type of queuing to use for the default traffic class.
Outbound - Shaper Policies	
traffic-policy shaper <policy-name>	Defines a traffic shaping QoS policy.
traffic-policy shaper <policy-name> bandwidth	Specifies the bandwidth available for all combined traffic constrained by this policy.
traffic-policy shaper <policy-name> description <desc>	Specifies a description for a traffic shaper QoS policy.
Outbound - Shaper Policy Classes	
traffic-policy shaper <policy-name> class <class>	Defines a traffic class for a traffic shaper QoS policy.
traffic-policy shaper <policy-name> class <class> bandwidth	Specifies the base guaranteed bandwidth rate for a traffic class.
traffic-policy shaper <policy-name> class <class> burst	Sets the burst size for a traffic class.
traffic-policy shaper <policy-name> class <class> ceiling	Sets a bandwidth ceiling for a traffic class.
traffic-policy shaper <policy-name> class <class> description <desc>	Sets a description for a traffic class.

traffic-policy shaper <policy-name> class <class> match <match-name>	Defines a traffic class matching rule.
traffic-policy shaper <policy-name> class <class> match <match-name> description <desc>	Sets a description for a match rule.
traffic-policy shaper <policy-name> class <class> match <match-name> ether destination <mac-addr>	Specifies a match criterion based on Ethernet destination (MAC) address.
traffic-policy shaper <policy-name> class <class> match <match-name> ether protocol <num>	Specifies a match criterion based on Ethernet packet type.
traffic-policy shaper <policy-name> class <class> match <match-name> ether source <mac-addr>	Specifies a match criterion based on Ethernet source (MAC) address.
traffic-policy shaper <policy-name> class <class> match <match-name> interface <interface>	Specifies a match criterion based on incoming interface.
traffic-policy shaper <policy-name> class <class> match <match-name> ip destination	Specifies a match criterion based on IP destination information.
traffic-policy shaper <policy-name> class <class> match <match-name> ip dscp <value>	Specifies a match criterion based on the value of the DSCP field.
traffic-policy shaper <policy-name> class <class> match <match-name> ip protocol <proto>	Specifies a match criterion based on the IP protocol.
traffic-policy shaper <policy-name> class <class> match <match-name> ip source	Specifies a match criterion based on source IP information.
traffic-policy shaper <policy-name> class <class> match <match-name> ipv6 destination	Specifies a match criterion based on IPv6 destination information.
traffic-policy shaper <policy-name> class <class> match <match-name> ipv6 dscp <value>	Specifies a match criterion based on the value of the DSCP field.
traffic-policy shaper <policy-name> class <class> match <match-name> ipv6 protocol <proto>	Specifies a match criterion based on the IPv6 protocol.
traffic-policy shaper <policy-name> class <class> match <match-name> ipv6 source	Specifies a match criterion based on source IPv6 information.
traffic-policy shaper <policy-name> class <class> match <match-name> vif <vlan-id>	Specifies a a match criterion based on VLAN ID.
traffic-policy shaper <policy-name> class <class> priority <priority>	Specifies the priority of a traffic class for allocation of extra bandwidth.
traffic-policy shaper <policy-name> class <class> queue-limit <limit>	Specifies the maximum queue size for a traffic class.
traffic-policy shaper <policy-name> class <class> queue-type <type>	Specifies the type of queuing to use for a traffic class.

traffic-policy shaper <policy-name> class <class> set-dscp <value>	Rewrites the DSCP field in packets in this traffic class to the specified value.
Outbound - Shaper Policy Default Class	
traffic-policy shaper <policy-name> default	Defines a default traffic shaper QoS policy.
traffic-policy shaper <policy-name> default bandwidth	Specifies the base guaranteed bandwidth rate for the default traffic class.
traffic-policy shaper <policy-name> default burst	Sets the burst size for the default traffic class.
traffic-policy shaper <policy-name> default ceiling	Sets a bandwidth ceiling for the default traffic class.
traffic-policy shaper <policy-name> default priority <priority>	Specifies the priority of the default traffic class for allocation of extra bandwidth.
traffic-policy shaper <policy-name> default queue-limit <limit>	Specifies the maximum queue size for the default traffic class.
traffic-policy shaper <policy-name> default queue-type <type>	Specifies the type of queuing to use for the default traffic class.
traffic-policy shaper <policy-name> default set-dscp <value>	Rewrites the DSCP field in packets in the default traffic class to the specified value.
Operational Commands	
show incoming	Displays incoming packet actions.
show queueing	Displays outgoing packet actions.

interfaces <interface> traffic-policy

Applies a QoS policy to the specified interface.

Syntax

set interfaces *interface* **traffic-policy** [**in** | **out**] *policy-name*

delete interfaces *interface* **traffic-policy** [**in** | **out**] *policy-name*

show interfaces *interface* **traffic-policy** [**in** | **out**] *policy-name*

Command Mode

Configuration mode.

Configuration Statement

```
interfaces interface {
   traffic-policy {
      [in | out] policy-name
   }
}
```

Parameters

interface	Mandatory. The type of interface. For detailed keywords and arguments that can be specified as interface types, see the table in the Usage Guidelines below.
in	Apply the QoS policy to inbound traffic on this interface. Note that inbound QoS policies cannot be applied to vif interfaces.
out	Apply the QoS policy to outbound traffic on this interface.
policy-name	The name of the QoS policy to apply to this interface.

Default

None.

Usage Guidelines

Use this command to apply a QoS policy to an interface.

The following table shows the syntax and parameters for supported interface types.

Interface Type	Syntax	Parameters
ADSL Bridged Ethernet	adsl *adslx* pvc *pvc-id* bridged-ethernet	*adslx* The name of a Bridged Ethernet- encapsulated DSL interface. *pvc-id* The identifier for the PVC. It can either be the *vpi*/*vci* pair or the keyword **auto**, where *vpi* is a Virtual Path Index from 0 to 255, *vci* is a Virtual Circuit Index from from 0 to 65535, and **auto** directs the system to detect the Virtual Path Index and Virtual Circuit Index automatically.
ADSL Classical IPOA	adsl *adslx* pvc *pvc-id* classical-ipoa	*adslx* The name of a Classical IPoA- encapsulated DSL interface. *pvc-id* The identifier for the PVC. It can either be the *vpi*/*vci* pair or the keyword **auto**, where *vpi* is a Virtual Path Index from 0 to 255, *vci* is a Virtual Circuit Index from from 0 to 65535, and **auto** directs the system to detect the Virtual Path Index and Virtual Circuit Index automatically.
ADSL PPPoA	adsl *adslx* pvc *pvc-id* pppoa *num*	*adslx* The name of a Classical IPoA- encapsulated DSL interface. *pvc-id* The identifier for the PVC. It can either be the *vpi*/*vci* pair or the keyword **auto**, where *vpi* is a Virtual Path Index from 0 to 255, *vci* is a Virtual Circuit Index from from 0 to 65535, and **auto** directs the system to detect the Virtual Path Index and Virtual Circuit Index automatically. *num* The PPPoA unit number. This number must be unique across all PPPoA interfaces. In addition, only one PPPoA instance can be configured on a PVC. PPPoA units range from 0 to 15 and the resulting interfaces are named pppoa0 to pppoa15.
ADSL PPPoE	adsl *adslx* pvc *pvc-id* pppoe *num*	*adslx* The name of a Classical IPoA- encapsulated DSL interface. *pvc-id* The identifier for the PVC. It can either be the *vpi*/*vci* pair or the keyword **auto**, where *vpi* is a Virtual Path Index from 0 to 255, *vci* is a Virtual Circuit Index from from 0 to 65535, and **auto** directs the system to detect the Virtual Path Index and Virtual Circuit Index automatically. *num* The name of a defined PPPoE unit. The range is 0 to 15.
Bonding	bonding *bondx*	*bondx* The identifier for the bonding interface. Supported values are **bond0** through **bond99**.

Interface Type	Syntax	Parameters
Bonding Vif	bonding *bondx* vif *vlan-id*	*bondx* The identifier for the bonding interface. Supported values are **bond0** through **bond99**. *vlan-id* The VLAN ID for the vif. The range is 0 to 4094.
Bridge	bridge *brx*	*brx* The name of a Bridge group. The range is **br0** through **br999**.
Ethernet	ethernet *ethx*	*ethx* The name of an Ethernet interface. The range is **eth0** through **eth23**, depending on the physical interfaces available on your system.
Ethernet PPPoE	ethernet *ethx* pppoe *num*	*ethx* The name of an Ethernet interface. The range is **eth0** through **eth23**, depending on the physical interfaces available on your system. *num* The name of a defined PPPoE unit. The range is 0 to 15.
Ethernet Vif	ethernet *ethx* vif *vlan-id*	*ethx* The name of an Ethernet interface. The range is **eth0** through **eth23**, depending on the physical interfaces available on your system. *vlan-id* The VLAN ID for the vif. The range is 0 to 4094.
Ethernet Vif PPPoE	ethernet *ethx* vif *vlan-id* pppoe *num*	*ethx* The name of an Ethernet interface. The range is **eth0** through **eth23**, depending on the physical interfaces available on your system. *vlan-id* The VLAN ID for the vif. The range is 0 to 4094. *num* The name of a defined PPPoE unit. The range is 0 to 15.
Loopback	loopback *lo*	*lo* The name of the loopback interface.
Multilink	multilink *mlx* vif *1*	*mlx* The identifier of the multilink bundle. You can create up to two multilink bundles. Supported values are **ml0** (“em ell zero”) through **ml23** (“em ell twenty-three”). *1* The identifier of the virtual interface. Currently, only one vif is supported for multilink interfaces, and the identifier must be 1. The vif must already have been defined.
OpenVPN	openvpn *vtunx*	*vtunx* The identifier for the OpenVPN interface. This may be **vtun0** to **vtun*x***, where ***x*** is a non-negative integer.
Pseudo-Ethernet	pseudo-ethernet *pethx*	*pethx* The name of a pseudo-Ethernet interface. The range is **peth0** through **peth999**.

Interface Type	Syntax	Parameters
Serial Cisco HDLC	serial *wanx* cisco-hdlc vif *1*	*wanx* The serial interface you are configuring: one of **wan0** through **wan23**. The interface must already have been defined. *1* The identifier of the virtual interface. Currently, only one vif is supported for Cisco HDLC interfaces, and the identifier must be 1. The vif must already have been defined.
Serial Frame Relay	serial *wanx* frame-relay vif *dlci*	*wanx* The serial interface you are configuring: one of **wan0** through **wan23**. The interface must already have been defined. *dlci* The identifier of the virtual interface. For Frame Relay interfaces, this is the DLCI number for the interface. the range is 16 to 991. The vif must already have been defined.
Serial PPP	serial *wanx* ppp vif *1*	*wanx* The serial interface you are configuring: one of **wan0** through **wan23**. The interface must already have been defined. *1* The identifier of the virtual interface. Currently, only one vif is supported for point-to-point interfaces, and the identifier must be 1. The vif must already have been defined.
Tunnel	tunnel *tunx*	*tunx* An identifier for the tunnel interface you are defining. The range is **tun0** to **tun23**.
VRRP	interface *parent-if* vrrp vrrp-group *group* interface	*parent-if* The type and identifier of the parent interface; for example, **ethernet eth0** or **bonding bond0**. *group* The VRRP group identifier. The name of the VRRP interface is not specified. The system internally constructs the interface name from the parent interface identifier plus the VRRP group number—for example, **eth0v99**, **eth0.15v99**, **bond0v99**, ot **bond0.15v99**. Note that VRRP interfaces support the same feature set as the parent interface does.
Wireless	wireless *wlanx*	*wlanx* The identifier for the wireless interface you are using. This may be **wlan0** to **wlan999**.
Wireless Modem	wirelessmodem *wlmx*	*wlmx* The identifier for the wireless modem interface you are using. This may be **wlm0** to **wlm999**.

Use the **set** form of this command to apply the QoS policy to the interface.

Use the **delete** form of this command to remove the QoS policy from the interface.

Use the **show** form of this command to display QoS policy configuration for an interface.

show incoming

Displays incoming packet actions.

Syntax

show incoming [*interface-type* [*interface*]]

Command Mode

Operational mode.

Parameters

interface-type	Optional. The type of interface whose incoming policies you wish to see. Possible values include **adsl**, **bonding**, **ethernet**, **input**, **pppoe**, **pseudo-ethernet**, **serial**, **tunnel**, and **wireless**.
interface	Optional. The specific interface (e.g. eth0).

Default

None.

Usage Guidelines

Use this command to display incoming packet actions.

Examples

Example 3-1 shows all incoming packet actions.

Example 3-1 "show incoming": Displaying all incoming packet actions.

```
vyatta@vyatta:~$ show incoming
Interface  Action     Received   Dropped   Overlimit
eth0       limiter    32         10        0
eth2       redirect   64         0         0
vyatta@vyatta:~$
```

show queueing

Displays outgoing packet actions.

Syntax

show queueing [*interface-type* [*interface*]]

Command Mode

Operational mode.

Parameters

interface-type	Optional. The type of interface whose QoS policies you wish to see. Possible values include **adsl**, **bonding**, **ethernet**, **input**, **pppoe**, **pseudo-ethernet**, **serial**, **tunnel**, and **wireless**.
interface	Optional. The specific interface (e.g. eth0).

Default

None.

Usage Guidelines

Use this command to display outgoing packet actions.

Examples

Example 3-2 shows all outgoing QoS policies.

Example 3-2 "show queueing": Displaying all outgoing QoS policies.

```
vyatta@vyatta:~$ show queueing
Interface  Policy                 Sent    Dropped  Overlimit
eth0       weighted-random           0          0          0
eth1       default               36888          0          0
eth2       default                 408          0          0
ifb0       shaper                   92          0          0
vyatta@vyatta:~$
```

Example 3-3 shows specific QoS policies.

Example 3-3 "show queueing ethernet eth0": Displaying QoS policies on a specific interface.

```
vyatta@vyatta:~$ show queueing ethernet eth0
eth0 Output queue:
Class      Policy                 Sent    Dropped   Overlimit
     1     shaper               106384          0          0
  8001     fair-queue            48286          0          0
  8002     fair-queue            58098          0          0
  8003     drop-tail                 0          0          0
vyatta@vyatta:~$
```

traffic-policy drop-tail <policy-name>

Defines a drop tail (pure FIFO) QoS policy.

Syntax

set traffic-policy drop-tail *policy-name*

delete traffic-policy drop-tail *policy-name*

show traffic-policy drop-tail *policy-name*

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    drop-tail policy-name {
    }
}
```

Parameters

policy-name	Mandatory. The name of the drop tail policy.

Default

None.

Usage Guidelines

Use this command to define a drop tail QoS policy. The drop tail policy acts on outbound traffic only. The policy name must be unique and not used with other QoS policy commands.

The drop tail policy provides a pure First In First Out (FIFO) queueing mechanism.

Use the **set** form of this command to create a drop tail policy.

Use the **delete** form of this command to remove a drop tail policy.

Use the **show** form of this command to display drop tail policy configuration.

traffic-policy drop-tail <policy-name> description <desc>

Sets a description for a drop tail policy.

Syntax

set traffic-policy drop-tail *policy-name* **description** *desc*

delete traffic-policy drop-tail *policy-name* **description**

show traffic-policy drop-tail *policy-name* **description**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    drop-tail policy-name {
        description desc
    }
}
```

Parameters

policy-name	Mandatory. The name of the drop tail policy.
desc	Mandatory. The description for this drop tail policy.

Default

None.

Usage Guidelines

Use this command to record a description for a drop tail policy.

Use the **set** form of this command to specify a description.

Use the **delete** form of this command to remove a description.

Use the **show** form of this command to display description configuration.

traffic-policy drop-tail <policy-name> queue-limit <limit>

Sets an upper bound for the number of packets allowed in the queue for a drop tail policy.

Syntax

set traffic-policy drop-tail *policy-name* **queue-limit** *limit*

delete traffic-policy drop-tail *policy-name* **queue-limit**

show traffic-policy drop-tail *policy-name* **queue-limit**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    drop-tail policy-name {
        queue-limit limit
    }
}
```

Parameters

policy-name	Mandatory. The name of the drop tail policy.
limit	Optional. The maximum queue size, in packets. The range is 0 to 4294967295. The default is the same as the underlying hardware transmit queue length. For Ethernet this is typically 1000 packets.

Default

For Ethernet the queue limit is typically 1000 packets.

Usage Guidelines

Use this command to set the maximum number of packets that can wait in a queue for this queuing policy. If maximum queue size is reached, the system begins dropping packets.

Use the **set** form of this command to set the queue limit.

Use the **delete** form of this command to restore the default queue limit.

Use the **show** form of this command to display queue limit configuration.

traffic-policy fair-queue <policy-name>

Defines a fair queue QoS policy.

Syntax

set traffic-policy fair-queue *policy-name*

delete traffic-policy fair-queue *policy-name*

show traffic-policy fair-queue *policy-name*

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    fair-queue policy-name {
    }
}
```

Parameters

policy-name	Mandatory. The name of the fair queue policy.

Default

None.

Usage Guidelines

Use this command to define a fair queue (FQ) QoS policy. The FQ policy acts on outbound traffic only. The policy name must be unique and not used with other QoS policy commands.

The Vyatta system uses Stochastic Fair Queuing, which is one of a number of FQ algorithms aiming to provide per-flow–based fairness. The FQ algorithm attempts to provide fair access to network resources and prevent any one flow from consuming an inordinate amount of output port bandwidth.

In Stochastic Fair Queuing, bandwidth is divided into separate hash buckets based on the combination of IP protocol, source, and destination address such that no single flow receives an unfair portion of bandwidth.

Use the **set** form of this command to create an FQ policy.

Use the **delete** form of this command to remove an FQ policy.

Use the **show** form of this command to display FQ policy configuration.

traffic-policy fair-queue <policy-name> description <desc>

Sets a description for a fair queue policy.

Syntax

set traffic-policy fair-queue *policy-name* **description** *desc*

delete traffic-policy fair-queue *policy-name* **description**

show traffic-policy fair-queue *policy-name* **description**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    fair-queue policy-name {
        description desc
    }
}
```

Parameters

policy-name	Mandatory. The name of the fair queue policy.
desc	Mandatory. The description for this fair queue policy.

Default

None.

Usage Guidelines

Use this command to record a description for a fair queue policy.

Use the **set** form of this command to specify a description.

Use the **delete** form of this command to remove a description.

Use the **show** form of this command to display description configuration.

traffic-policy fair-queue <policy-name> hash-interval <seconds>

Specifies the interval between flow hash function updates for a fair queue policy.

Syntax

set traffic-policy fair-queue *policy-name* **hash-interval** *seconds*

delete traffic-policy fair-queue *policy-name* **hash-interval**

show traffic-policy fair-queue *policy-name* **hash-interval**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    fair-queue policy-name {
        hash-interval seconds
    }
}
```

Parameters

policy-name	Mandatory. The name of the fair queue policy.
seconds	Mandatory. The rehash interval, in seconds. The range is 0 to 4294967295, where 0 means the hash function is never updated.

Default

The hash function is never updated.

Usage Guidelines

Use this command to set the interval at which the flow hash function is updated.

Updating the hash function at intervals increases security and prevents attacks based on an attacker determining the hash bucket for traffic flows and sending spoofed packets based on that information.

Use the **set** form of this command to specify a flow hash update interval.

Use the **delete** form of this command to restore the default hash interval.

Use the **show** form of this command to display hash interval configuration.

traffic-policy fair-queue <policy-name> queue-limit <limit>

Sets an upper bound for the number of packets allowed in the queue for a fair queue policy.

Syntax

set traffic-policy fair-queue *policy-name* **queue-limit** *limit*

delete traffic-policy fair-queue *policy-name* **queue-limit**

show traffic-policy fair-queue *policy-name* **queue-limit**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    fair-queue policy-name {
        queue-limit limit
    }
}
```

Parameters

policy-name	Mandatory. The name of the fair queue policy.
limit	Mandatory. The maximum queue size, in packets. The range is 0 to 4294967295. The default is 127.

Default

A queue is not permitted to exceed 127 packets.

Usage Guidelines

Use this command to set the maximum number of packets that can wait in a queue for this queuing policy. If maximum queue size is reached, the system begins dropping packets.

Use the **set** form of this command to set the queue limit.

Use the **delete** form of this command to restore the default queue limit.

Use the **show** form of this command to display queue limit configuration.

traffic-policy limiter <policy-name>

Defines a traffic limiter QoS policy.

Syntax

set traffic-policy limiter *policy-name*

delete traffic-policy limiter *policy-name*

show traffic-policy limiter *policy-name*

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.

Default

None.

Usage Guidelines

Use this command to define a traffic limiter QoS policy. Traffic limiter policy acts on inbound traffic only. The policy name must be unique and not used with other QoS policy commands.

Traffic is evaluated against the matching rules which are similar to outbound traffic shaper. Any traffic that matches no rules is let through unrestricted. Any traffic that exceeds the bandwidth limits is dropped.

Use the **set** form of this command to create a traffic limiter QoS policy.

Use the **delete** form of this command to remove a traffic limiter QoS policy.

Use the **show** form of this command to display traffic limiter QoS policy configuration.

traffic-policy limiter <policy-name> class <class>

Defines a traffic class for a traffic limiter QoS policy.

Syntax

set traffic-policy limiter *policy-name* **class** *class*

delete traffic-policy limiter *policy-name* **class** *class*

show traffic-policy limiter *policy-name* **class** *class*

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        class class {
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
class	Mandatory. The class ID. The range is 1 to 4095.

Default

None.

Usage Guidelines

Use this command to define a traffic class for a traffic limiter QoS policy. This allows packets to be grouped into various traffic classes, which can be treated with different levels of service.

Use the **set** form of this command to create a traffic class in a traffic limiter QoS policy.

Use the **delete** form of this command to remove a traffic class from a traffic limiter QoS policy.

Use the **show** form of this command to display traffic class configuration within a traffic limiter QoS policy.

traffic-policy limiter <policy-name> class <class> bandwidth

Specifies the bandwidth rate cap for a traffic class.

Syntax

set traffic-policy limiter *policy-name* **class** *class* **bandwidth** [*rate* | *rate-suffix*]

delete traffic-policy limiter *policy-name* **class** *class* **bandwidth**

show traffic-policy limiter *policy-name* **class** *class* **bandwidth**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        class class {
            bandwidth [rate | rate-suffix]
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
class	Mandatory. The class ID. The range is 1 to 4095.
rate	The bandwidth, specified in kilobits per second.

rate-suffix	The bandwidth, specified as a number and a scaling suffix (for example, 10mbit). The following suffixes are supported: **kbit**: Kilobits per second. **mbit**: Megabits per second. **gbit**: Gigabits per second. **kbps**: Kilobytes per second. **mbps**: Megabytes per second. **gbps**: Gigabytes per second.

Default

None. This value must be set.

Usage Guidelines

Use this command to set a bandwidth cap for a traffic class.

Use the **set** form of this command to set the available bandwidth for the traffic class.

Use the **delete** form of this command to restore the default available bandwidth for the traffic class.

Use the **show** form of this command to display class bandwidth configuration.

traffic-policy limiter <policy-name> class <class> burst

Sets the burst size for a traffic class.

Syntax

set traffic-policy limiter *policy-name* **class** *class* **burst** [*num* | *num-suffix*]

delete traffic-policy limiter *policy-name* **class** *class* **burst**

show traffic-policy limiter *policy-name* **class** *class* **burst**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        class class {
            burst [num | num-suffix]
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
class	Mandatory. The class ID. The range is 1 to 4095.
num	The burst size, specified in bytes.
num-suffix	The burst size, specified as a number and a scaling suffix (for example, 10mb). The following suffixes are supported: **kb**: Kilobytes. **mb**: Megabytes. **gb**: Gigabytes.

Default

The burst size is 15 kilobytes.

Usage Guidelines

Use this command to set the burst size for the traffic class. This is the maximum amount of traffic that may be sent at a given time.

Use the **set** form of this command to specify the burst size for a traffic class.

Use the **delete** form of this command to restore the default burst size for a traffic class.

Use the **show** form of this command to display traffic class burst size configuration.

traffic-policy limiter <policy-name> class <class> description <desc>

Sets a description for a traffic class.

Syntax

set traffic-policy limiter *policy-name* **class** *class* **description** *desc*

delete traffic-policy limiter *policy-name* **class** *class* **description**

show traffic-policy limiter *policy-name* **class** *class* **description**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        class class {
            description desc
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
class	Mandatory. The class ID. The range is 1 to 4095.
desc	The description for this traffic class.

Default

None.

Usage Guidelines

Use this command to record a description for a traffic class.

Use the **set** form of this command to specify a description.

Use the **delete** form of this command to remove a description.

Use the **show** form of this command to display description configuration.

traffic-policy limiter <policy-name> class <class> match <match-name>

Defines a traffic class matching rule.

Syntax

set traffic-policy limiter *policy-name* **class** *class* **match** *match-name*

delete traffic-policy limiter *policy-name* **class** *class* **match** *match-name*

show traffic-policy limiter *policy-name* **class** *class* **match** *match-name*

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        class class {
            match match-name {
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
class	Mandatory. The class ID. The range is 1 to 4095.
match-name	Mandatory. Class matching rule name.

Default

None.

Usage Guidelines

Use this command to define a rule setting out the match conditions for membership in a traffic class.

Use the **set** form of this command to create the traffic class matching rule. Note that you cannot use **set** to change the name of an existing traffic class matching rule. To change the rule, delete it and re-create it.

Use the **delete** form of this command to remove the traffic class matching rule configuration node.

Use the **show** form of this command to display traffic class matching rule configuration.

traffic-policy limiter <policy-name> class <class> match <match-name> description <desc>

Sets a description for a match rule.

Syntax

set traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **description** *desc*

delete traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **description**

show traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **description**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        class class {
            match match-name {
                description desc
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
class	Mandatory. The class ID. The range is 1 to 4095.
match-name	Mandatory. Class matching rule name.
desc	The description for this match.

Default

None.

Usage Guidelines

Use this command to record a description for a traffic class matching rule.

Use the **set** form of this command to set the description.

Use the **delete** form of this command to remove the description.

Use the **show** form of this command to display description configuration.

traffic-policy limiter <policy-name> class <class> match <match-name> ether destination <mac-addr>

Specifies a match criterion based on Ethernet destination (MAC) address.

Syntax

set traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ether destination** *mac-addr*

delete traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ether destination**

show traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ether destination**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        class class {
            match match-name {
                ether {
                    destination mac-addr
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
class	Mandatory. The class ID. The range is 1 to 4095.
match-name	Mandatory. Class matching rule name.

mac-addr	Performs a match based on the destination MAC address on the interface the policy is applied to. The format is 6 colon-spearated 8-bit numbers in hexidecimal; for example, 00:0a:59:9a:f2:ba.

Default

If not set, packets are not matched against the destination MAC address.

Usage Guidelines

Use this command to define a match condition based on destination MAC address for a traffic class.

Use the **set** form of this command to specify a destination to be matched.

Use the **delete** form of this command to remove destination as a match condition.

Use the **show** form of this command to display destination match condition configuration.

traffic-policy limiter <policy-name> class <class> match <match-name> ether protocol <num>

Specifies a match criterion based on Ethernet packet type.

Syntax

set traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ether protocol** *num*

delete traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ether protocol**

show traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ether protocol**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        class class {
            match match-name {
                ether {
                    protocol num
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
class	Mandatory. The class ID. The range is 1 to 4095.
match-name	Mandatory. Class matching rule name.
num	Performs a match based on the Ethernet packet type (i.e. protocol number). The range is 0 to 65535.

Default

If not set, packets are not matched against the Ethernet packet type.

Usage Guidelines

Use this command to define a match condition based on Ethernet packet type for a traffic class.

Use the **set** form of this command to specify the packet type to be matched.

Use the **delete** form of this command to remove packet type as a match condition.

Use the **show** form of this command to display packet type match condition configuration.

traffic-policy limiter <policy-name> class <class> match <match-name> ether source <mac-addr>

Specifies a match criterion based on Ethernet source (MAC) address.

Syntax

set traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ether source** *mac-addr*

delete traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ether source**

show traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ether source**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        class class {
            match match-name {
                ether {
                    source mac-addr
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
class	Mandatory. The class ID. The range is 1 to 4095.
match-name	Mandatory. Class matching rule name.
mac-addr	Performs a match based on the source MAC address. The format is 6 colon-spearated 8-bit numbers in hexidecimal; for example, 00:0a:59:9a:f2:ba.

Default

If not set, packets are not matched against the source MAC address.

Usage Guidelines

Use this command to define a match condition based on source MAC address for a traffic class.

Use the **set** form of this command to specify a source to be matched.

Use the **delete** form of this command to remove source as a match condition.

Use the **show** form of this command to display source match condition configuration.

traffic-policy limiter <policy-name> class <class> match <match-name> ip destination

Specifies a match criterion based on IP destination information.

Syntax

set traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ip destination** {**address** *ipv4net* | **port** *port}*

delete traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ip destination** [**address** | **port**]

show traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ip destination**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        class class {
            match match-name {
                ip {
                    destination {
                        address ipv4net
                        port port
                    }
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
class	Mandatory. The class ID. The range is 1 to 4095.
match-name	Mandatory. Class matching rule name.
ipv4net	Performs a match based on the destination IP subnet address.

port	Performs a match based on destination port. The port may be specified as a lower-case name (for example **ssh**) or as a number. The range for port numbers is 0 to 65535.

Default

If not set, packets are not matched against destination information.

Usage Guidelines

Use this command to define a match condition based on destination subnet address and/or port for a traffic class.

You can match packets based on a destination represented by either or both of IP subnet address and destination port(s).

Note that you are not able to match on both “ip” and “vif” (or “interface”) inside the same traffic limiter configuration.

Use the **set** form of this command to specify a destination to be matched.

Use the **delete** form of this command to remove destination as a match condition.

Use the **show** form of this command to display destination match condition configuration.

traffic-policy limiter <policy-name> class <class> match <match-name> ip dscp <value>

Specifies a match criterion based on the value of the DSCP field.

Syntax

set traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ip dscp** *value*

delete traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ip dscp**

show traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ip dscp**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        class class {
            match match-name {
                ip {
                    dscp value
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
class	Mandatory. The class ID. The range is 1 to 4095.
match-name	Mandatory. Class matching rule name.
value	Performs a match based on the specified value. This value is compared with the value in the DSCP field of the ToS byte in the IP header. The DSCP value can be specified as a decimal number (for example, 12), as a hexidecimal number (for example 0x1D), or as a standard name from **/etc/iproute2/rt_dsfield** (for example, **lowdelay**).

Default

If not set, packets are not matched against DSCP value.

Usage Guidelines

Use this command to define a match condition based on the Differentiated Services Code Point (DSCP) field.

The DSCP field is a 6-bit field in the Type of Service (ToS) byte of the IP header. It provides a way of marking packets in order to allow classification of traffic into service classes, and traffic conditioning such as metering, policing, and shaping.

Note that you are not able to match on both “ip” and “vif” (or “interface”) inside the same traffic limiter configuration.

Use the **set** form of this command to set a match condition based on DSCP value.

Use the **delete** form of this command to remove DSCP as a match condition.

Use the **show** form of this command to display DSCP value configuration.

traffic-policy limiter <policy-name> class <class> match <match-name> ip protocol <proto>

Specifies a match criterion based on the IP protocol.

Syntax

set traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ip protocol** *proto*

delete traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ip protocol**

show traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ip protocol**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        class class {
            match match-name {
                ip {
                    protocol proto
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
class	Mandatory. The class ID. The range is 1 to 4095.
match-name	Mandatory. Class matching rule name.
proto	Performs a match based on the protocol name (for example, **icmp**) or number, as assigned by the IANA.

Default

If not set, packets are not matched against IP protocol.

Usage Guidelines

Use this command to define a match condition for a traffic class based on protocol.

Note that you are not able to match on both “ip” and “vif” (or “interface”) inside the same traffic limiter configuration.

Use the **set** form of this command to set a match condition based on protocol.

Use the **delete** form of this command to remove protocol value as a match condition.

Use the **show** form of this command to match condition protocol configuration.

traffic-policy limiter <policy-name> class <class> match <match-name> ip source

Specifies a match criterion based on source IP information.

Syntax

set traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ip source** {**address** *ipv4net* | **port** *port}*

delete traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ip source** {**address** | **port**}

show traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ip source**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        class class {
            match match-name {
                ip {
                    source {
                        address ipv4net
                        port port
                    }
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
class	Mandatory. The class ID. The range is 1 to 4095.
match-name	Mandatory. Class matching rule name.
ipv4net	The source IP subnet address to match for this rule.

port	The source port to match for this rule. The port may be specified as a lower-case name (for example **ssh**) or as a number. The range for port numbers is 0 to 65535.

Default

If not set, packets are not matched against IP source information.

Usage Guidelines

Use this command to define a match condition based on source subnet address and/or port for a traffic class.

You can match packets based on a source represented by either or both of IP subnet address and destination port(s).

Note that you are not able to match on both “ip” and “vif” (or “interface”) inside the same traffic limiter configuration.

Use the **set** form of this command to specify a source to be matched.

Use the **delete** form of this command to remove source as a match condition.

Use the **show** form of this command to display source match condition configuration.

traffic-policy limiter <policy-name> class <class> match <match-name> ipv6 destination

Specifies a match criterion based on IPv6 destination information.

Syntax

set traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ipv6 destination** {**address** *ipv6net* | **port** *port*}

delete traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ipv6 destination** [**address** | **port**]

show traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ipv6 destination**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        class class {
            match match-name {
                ipv6 {
                    destination {
                        address ipv6net
                        port port
                    }
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
class	Mandatory. The class ID. The range is 1 to 4095.
match-name	Mandatory. Class matching rule name.

ipv6net	Performs a match based on the destination IPv6 subnet address.
port	Performs a match based on destination port. The port may be specified as a lower-case name (for example **ssh**) or as a number. The range for port numbers is 0 to 65535.

Default

If not set, packets are not matched against destination information.

Usage Guidelines

Use this command to define a match condition based on destination subnet address and/or port for a traffic class.

You can match packets based on a destination represented by either or both of IPv6 subnet address and destination port(s).

Note that you are not able to match on both “ipv6” and “vif” (or “interface”) inside the same traffic limiter configuration.

Use the **set** form of this command to specify a destination to be matched.

Use the **delete** form of this command to remove destination as a match condition.

Use the **show** form of this command to display destination match condition configuration.

traffic-policy limiter <policy-name> class <class> match <match-name> ipv6 dscp <value>

Specifies a match criterion based on the value of the DSCP field.

Syntax

set traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ipv6 dscp** *value*

delete traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ipv6 dscp**

show traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ipv6 dscp**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        class class {
            match match-name {
                ipv6 {
                    dscp value
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
class	Mandatory. The class ID. The range is 1 to 4095.
match-name	Mandatory. Class matching rule name.
value	Performs a match based on the specified value. This value is compared with the value in the DSCP field of the ToS byte in the IP header. The DSCP value can be specified as a decimal number (for example, 12), as a hexidecimal number (for example 0x1D), or as a standard name from **/etc/iproute2/rt_dsfield** (for example, **lowdelay**).

Default

If not set, packets are not matched against DSCP value.

Usage Guidelines

Use this command to define a match condition based on the Differentiated Services Code Point (DSCP) field.

The DSCP field is a 6-bit field in the Type of Service (ToS) byte of the IP header. It provides a way of marking packets in order to allow classification of traffic into service classes, and traffic conditioning such as metering, policing, and shaping.

Note that you are not able to match on both “ipv6” and “vif” (or “interface”) inside the same traffic limiter configuration.

Use the **set** form of this command to set a match condition based on DSCP value.

Use the **delete** form of this command to remove DSCP as a match condition.

Use the **show** form of this command to display DSCP value configuration.

traffic-policy limiter <policy-name> class <class> match <match-name> ipv6 protocol <proto>

Specifies a match criterion based on the IPv6 protocol.

Syntax

set traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ipv6 protocol** *proto*

delete traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ipv6 protocol**

show traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ipv6 protocol**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        class class {
            match match-name {
                ipv6 {
                    protocol proto
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
class	Mandatory. The class ID. The range is 1 to 4095.
match-name	Mandatory. Class matching rule name.
proto	Performs a match based on the protocol name (for example, **icmp**) or number, as assigned by the IANA.

Default

If not set, packets are not matched against IP protocol.

Usage Guidelines

Use this command to define a match condition for a traffic class based on protocol.

Note that you are not able to match on both “ipv6” and “vif” (or “interface”) inside the same traffic limiter configuration.

Use the **set** form of this command to set a match condition based on protocol.

Use the **delete** form of this command to remove protocol value as a match condition.

Use the **show** form of this command to match condition protocol configuration.

traffic-policy limiter <policy-name> class <class> match <match-name> ipv6 source

Specifies a match criterion based on source IPv6 information.

Syntax

set traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ipv6 source** {**address** *ipv6net* | **port** *port*}

delete traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ipv6 source** {**address** | **port**}

show traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **ipv6 source**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        class class {
            match match-name {
                ipv6 {
                    source {
                        address ipv6net
                        port port
                    }
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
class	Mandatory. The class ID. The range is 1 to 4095.
match-name	Mandatory. Class matching rule name.
ipv6net	The source IPv6 subnet address to match for this rule.

port	The source port to match for this rule. The port may be specified as a lower-case name (for example **ssh**) or as a number. The range for port numbers is 0 to 65535.

Default

If not set, packets are not matched against IP source information.

Usage Guidelines

Use this command to define a match condition based on source subnet address and/or port for a traffic class.

You can match packets based on a source represented by either or both of IPv6 subnet address and destination port(s).

Note that you are not able to match on both “ipv6” and “vif” (or “interface”) inside the same traffic limiter configuration.

Use the **set** form of this command to specify a source to be matched.

Use the **delete** form of this command to remove source as a match condition.

Use the **show** form of this command to display source match condition configuration.

traffic-policy limiter <policy-name> class <class> match <match-name> vif <vlan-id>

Specifies a match criterion based on VLAN ID.

Syntax

set traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **vif** *vlan-id*

delete traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **vif**

show traffic-policy limiter *policy-name* **class** *class* **match** *match-name* **vif**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        class class {
            match match-name {
                vif vlan-id
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
class	Mandatory. The class ID. The range is 1 to 4095.
match-name	Mandatory. Class matching rule name.
vlan-id	Performs a match based on VLAN ID. The range is 1 to 4096.

Default

If not set, packets are not matched against VLAN ID.

Usage Guidelines

Use this command to define a match condition based on VLAN ID for a traffic class.

Note that you are not able to match on both “ip” and “vif” (or “interface”) inside the same traffic limiter configuration.

Use the **set** form of this command to specify a VLAN ID to be matched.

Use the **delete** form of this command to remove VLAN ID as a match condition.

Use the **show** form of this command to display VLAN ID match condition configuration.

traffic-policy limiter <policy-name> class <class> priority <priority>

Specifies the order of evaluation of matching rules.

Syntax

set traffic-policy limiter *policy-name* **class** *class* **priority** *priority*

delete traffic-policy limiter *policy-name* **class** *class* **priority**

show traffic-policy limiter *policy-name* **class** *class* **priority**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        class class {
            priority priority
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
class	Mandatory. The class ID. The range is 1 to 4095.
priority	The priority with which matching rules are evaluated. The range is 0 to 20, where the higher the number the lower the priority. The default is 20.

Default

Traffic classes are assigned a priority of 20.

Usage Guidelines

Use this command to set the priority with which matching rules are evaluated.

Use the **set** form of this command to specify priority for a traffic class.

Use the **delete** form of this command to restore the default priority for a traffic class.

Use the **show** form of this command to display traffic class priority configuration.

traffic-policy limiter <policy-name> default

Defines a default traffic class for a traffic limiter QoS policy.

Syntax

set traffic-policy limiter *policy-name* **default**

delete traffic-policy limiter *policy-name* **default**

show traffic-policy limiter *policy-name* **default**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        default {
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.

Default

None.

Usage Guidelines

Use this command to define a default traffic class for a traffic limiter QoS policy. All traffic that doesn't match any of the other classes defined for this policy are handled by the default class.

Use the **set** form of this command to create a default traffic class in a traffic limiter QoS policy.

Use the **delete** form of this command to remove the default traffic class from a traffic limiter QoS policy.

Use the **show** form of this command to display the default traffic class configuration within a traffic limiter QoS policy.

traffic-policy limiter <policy-name> default bandwidth

Specifies the bandwidth rate cap for the default traffic class.

Syntax

set traffic-policy limiter *policy-name* **default bandwidth** [*rate* | *rate-suffix*]

delete traffic-policy limiter *policy-name* **default bandwidth**

show traffic-policy limiter *policy-name* **default bandwidth**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        default {
            bandwidth [rate | rate-suffix]
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
rate	The bandwidth, specified in kilobits per second.
rate-suffix	The bandwidth, specified as a number and a scaling suffix (for example, 10mbit). The following suffixes are supported: **kbit**: Kilobits per second. **mbit**: Megabits per second. **gbit**: Gigabits per second. **kbps**: Kilobytes per second. **mbps**: Megabytes per second. **gbps**: Gigabytes per second.

Default

None. This value must be set.

Usage Guidelines

Use this command to set a bandwidth cap for the default traffic class.

Use the **set** form of this command to set the available bandwidth for the default traffic class.

Use the **delete** form of this command to restore the default available bandwidth for the default traffic class.

Use the **show** form of this command to display default class bandwidth configuration.

traffic-policy limiter <policy-name> default burst

Sets the burst size for the default traffic class.

Syntax

set traffic-policy limiter *policy-name* **default burst** [*num* | *num-suffix*]

delete traffic-policy limiter *policy-name* **default burst**

show traffic-policy limiter *policy-name* **default burst**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        default {
            burst [num | num-suffix]
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
num	The burst size, specified in bytes.
num-suffix	The burst size, specified as a number and a scaling suffix (for example, 10mb). The following suffixes are supported: **kb**: Kilobytes. **mb**: Megabytes. **gb**: Gigabytes.

Default

The burst size is 15 kilobytes.

Usage Guidelines

Use this command to set the burst size for the default traffic class. This is the maximum amount of traffic that may be sent at a given time.

Use the **set** form of this command to specify the burst size for the default traffic class.

Use the **delete** form of this command to restore the default burst size for the default traffic class.

Use the **show** form of this command to display default traffic class burst size configuration.

traffic-policy limiter <policy-name> default priority <priority>

Specifies the order of evaluation of matching rules for the default traffic class.

Syntax

set traffic-policy limiter *policy-name* **default priority** *priority*

delete traffic-policy limiter *policy-name* **default priority**

show traffic-policy limiter *policy-name* **default priority**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        default {
            priority priority
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
priority	The priority with which matching rules are evaluated. The range is 0 to 20, where the higher the number the lower the priority. The default is 20.

Default

Traffic classes are assigned a priority of 20.

Usage Guidelines

Use this command to set the priority with which matching rules are evaluated.

Use the **set** form of this command to specify priority for the default traffic class.

Use the **delete** form of this command to restore the default priority for the default traffic class.

Use the **show** form of this command to display default traffic class priority configuration.

traffic-policy limiter <policy-name> description <desc>

Specifies a description for a traffic limiter QoS policy.

Syntax

set traffic-policy limiter *policy-name* **description** *desc*

delete traffic-policy limiter *policy-name* **description**

show traffic-policy limiter *policy-name* **description**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    limiter policy-name {
        description desc
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic limiting policy.
desc	The description for this traffic limiter policy.

Default

None.

Usage Guidelines

Use this command to record a description for a traffic limiter policy.

Use the **set** form of this command to specify a description for a traffic limiter policy.

Use the **delete** form of this command to remove a description from a traffic limiter policy.

Use the **show** form of this command to display description configuration for a traffic limiter policy.

traffic-policy network-emulator <policy-name>

Defines a network emulator QoS policy.

Syntax

set traffic-policy network-emulator *policy-name*

delete traffic-policy network-emulator *policy-name*

show traffic-policy network-emulator *policy-name*

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    network-emulator policy-name {
    }
}
```

Parameters

policy-name	Mandatory. The name of the network emulator policy.

Default

None.

Usage Guidelines

Use this command to define a network emulation QoS policy used to emulate WAN networks. The policy name must be unique and not used with other QoS policy commands.

Use the **set** form of this command to create a network emulator QoS policy.

Use the **delete** form of this command to remove a network emulator QoS policy.

Use the **show** form of this command to display network emulator QoS policy configuration.

traffic-policy network-emulator <policy-name> bandwidth

Specifies the bandwidth limit for all combined traffic constrained by this policy.

Syntax

set traffic-policy network-emulator *policy-name* **bandwidth** [*rate* | *rate-suffix*]

delete traffic-policy network-emulator *policy-name* **bandwidth**

show traffic-policy network-emulator *policy-name* **bandwidth**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    network-emulator policy-name {
        bandwidth [rate | rate-suffix]
    }
}
```

Parameters

policy-name	Mandatory. The name of the network emulator policy.
rate	Optional. The bandwidth, specified in kilobits per second.
rate-suffix	The bandwidth, specified as a number and a scaling suffix (for example, 10mbit). The following suffixes are supported: **kbit**: Kilobits per second. **mbit**: Megabits per second. **gbit**: Gigabits per second. **kbps**: Kilobytes per second. **mbps**: Megabytes per second. **gbps**: Gigabytes per second.

Default

Traffic flows at maximum speed.

Usage Guidelines

Use this command to set bandwidth constraints for a network emulator QoS policy. This is the maximum bandwidth available to the network emulator policy.

Use the **set** form of this command to specify bandwidth constraints for the policy.

Use the **delete** form of this command to restore default bandwidth constraints for the policy.

Use the **show** form of this command to display policy bandwidth configuration.

traffic-policy network-emulator <policy-name> burst

Sets the burst size for a network emulation QoS policy.

Syntax

set traffic-policy network-emulator *policy-name* **burst** [*num* | *num-suffix*]

delete traffic-policy network-emulator *policy-name* **burst**

show traffic-policy network-emulator *policy-name* **burst**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    network-emulator policy-name {
        burst [num | num-suffix]
    }
}
```

Parameters

policy-name	Mandatory. The name of the network emulator policy.
num	The burst size, specified in bytes.
num-suffix	The burst size, specified as a number and a scaling suffix (for example, 10mb). The following suffixes are supported: **kb**: Kilobytes. **mb**: Megabytes. **gb**: Gigabytes.

Default

The default burst size is 15 kilobytes.

Usage Guidelines

Use this command to set the burst size for a network emulator QoS policy. This is the maximum amount of traffic that may be sent at a given time and is only used with the **bandwidth** parameter.

Use the **set** form of this command to specify the burst size for a network emulator QoS policy.

Use the **delete** form of this command to restore the default burst size for a network emulator QoS policy.

Use the **show** form of this command to display network emulator burst size configuration.

traffic-policy network-emulator <policy-name> description <desc>

Sets a description for a network emulator policy.

Syntax

set traffic-policy network-emulator *policy-name* **description** *desc*

delete traffic-policy network-emulator *policy-name* **description**

show traffic-policy network-emulator *policy-name* **description**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    network-emulator policy-name {
        description desc
    }
}
```

Parameters

policy-name	Mandatory. The name of the network emulator policy.
desc	Mandatory. The description for this network emulator policy.

Default

None.

Usage Guidelines

Use this command to record a description for a network emulator policy.

Use the **set** form of this command to specify a description.

Use the **delete** form of this command to remove a description.

Use the **show** form of this command to display description configuration.

traffic-policy network-emulator <policy-name> network-delay

Sets the amount of delay between packets for a network emulation QoS policy.

Syntax

set traffic-policy network-emulator *policy-name* **network-delay** [*num* | *num-suffix*]

delete traffic-policy network-emulator *policy-name* **network-delay**

show traffic-policy network-emulator *policy-name* **network-delay**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    network-emulator policy-name {
        network-delay [num | num-suffix]
    }
}
```

Parameters

policy-name	Mandatory. The name of the network emulator policy.
num	The latency, specified in milliseconds.
num-suffix	The latency, specified as a time and a scaling suffix (for example, 10ms). The following suffixes are supported: **secs**: Seconds. **ms**: Milliseconds. **us**: Microseconds.

Default

None.

Usage Guidelines

Use this command to set the network delay for a network emulator QoS policy. This is the amount of delay that will be added between packets.

Use the **set** form of this command to specify the network delay for a network emulator QoS policy.

Use the **delete** form of this command to restore the default network delay for a network emulator QoS policy.

Use the **show** form of this command to display network delay configuration.

traffic-policy network-emulator <policy-name> packet-corruption <percent>

Sets the percentage of packets to corrupt in a network emulation QoS policy.

Syntax

set traffic-policy network-emulator *policy-name* **packet-corruption** *percent*[%]

delete traffic-policy network-emulator *policy-name* **packet-corruption**

show traffic-policy network-emulator *policy-name* **packet-corruption**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    network-emulator policy-name {
        packet-corruption percent
    }
}
```

Parameters

policy-name	Mandatory. The name of the network emulator policy.
percent	The percentage of packets to corrupt on a random basis.

Default

No packets will be corrupted (i.e. 0%).

Usage Guidelines

Use this command to set the percentage of packets to corrupt in a network emulator QoS policy. This emulates link problems which cause packet corruption by flipping one random bit in the packet and not modifying the checksum.

Use the **set** form of this command to specify the percentage of packets to randomly corrupt for a network emulator QoS policy.

Use the **delete** form of this command to restore the default percentage of packets to corrupt for a network emulator QoS policy.

Use the **show** form of this command to display packet corruption configuration.

traffic-policy network-emulator <policy-name> packet-loss <percent>

Sets the percentage of packets to drop in a network emulation QoS policy.

Syntax

set traffic-policy network-emulator *policy-name* **packet-loss** *percent*[%]

delete traffic-policy network-emulator *policy-name* **packet-loss**

show traffic-policy network-emulator *policy-name* **packet-loss**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    network-emulator policy-name {
        packet-loss percent
    }
}
```

Parameters

policy-name	Mandatory. The name of the network emulator policy.
percent	The percentage of packets to drop on a random basis.

Default

No packets will be dropped (i.e. 0%).

Usage Guidelines

Use this command to set the percentage of packets to drop in a network emulator QoS policy. This emulates link problems which cause packet loss.

Use the **set** form of this command to specify the percentage of packets to randomly drop for a network emulator QoS policy.

Use the **delete** form of this command to restore the default percentage of packets to drop for a network emulator QoS policy.

Use the **show** form of this command to display packet loss configuration.

traffic-policy network-emulator <policy-name> packet-reordering <percent>

Sets the percentage of packets to reorder in a network emulation QoS policy.

Syntax

set traffic-policy network-emulator *policy-name* **packet-reordering** *percent*[%]

delete traffic-policy network-emulator *policy-name* **packet-reordering**

show traffic-policy network-emulator *policy-name* **packet-reordering**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    network-emulator policy-name {
        packet-reordering percent
    }
}
```

Parameters

policy-name	Mandatory. The name of the network emulator policy.
percent	The percentage of packets to reorder on a random basis.

Default

No packets will be reordered (i.e. 0%).

Usage Guidelines

Use this command to set the percentage of packets to reorder in a network emulator QoS policy. This emulates network issues which cause packet reordering. This mechanism will only have an impact when more than one packet is in the queue.

Use the **set** form of this command to specify the percentage of packets to randomly reorder for a network emulator QoS policy.

Use the **delete** form of this command to restore the default percentage of packets to reorder for a network emulator QoS policy.

Use the **show** form of this command to display packet reordering configuration.

traffic-policy network-emulator <policy-name> queue-limit <limit>

Sets an upper bound for the number of packets allowed in the queue for a network emulation QoS policy.

Syntax

set traffic-policy network-emulator *policy-name* **queue-limit** *limit*

delete traffic-policy network-emulator *policy-name* **queue-limit**

show traffic-policy network-emulator *policy-name* **queue-limit**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    network-emulator policy-name {
        queue-limit limit
    }
}
```

Parameters

policy-name	Mandatory. The name of the network emulator policy.
limit	Mandatory. The maximum queue size, in packets. The range is 0 to 4294967295. The default is 127.

Default

A queue is not permitted to exceed 127 packets.

Usage Guidelines

Use this command to set the maximum number of packets that can wait in a queue for this queuing policy. If maximum queue size is reached, the system begins dropping packets.

Use the **set** form of this command to set the queue limit.

Use the **delete** form of this command to restore the default queue limit.

Use the **show** form of this command to display queue limit configuration.

traffic-policy random-detect <policy-name>

Defines a Weighted Random Early Detection (WRED) QoS policy.

Syntax

set traffic-policy random-detect *policy-name*

delete traffic-policy random-detect *policy-name*

show traffic-policy random-detect *policy-name*

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    random-detect policy-name {
    }
}
```

Parameters

policy-name	Mandatory. The name of the random detect policy.

Default

None.

Usage Guidelines

Use this command to define a random detect QoS policy based on the Weighted Random Early Detection (WRED) congestion avoidance mechanism. Random detect policy acts on outbound traffic only. The policy name must be unique and not used with other QoS policy commands.

The Random Early Detection (RED) mechanism randomly drops packets prior to periods of high congestion in order to signal the source to decrease its transmission rate. This helps avoid the condition where output buffers fill and packets at the tail of the buffer (as well as newly arriving packets to the buffer) are dropped. This can cause global resyncronization of TCP hosts as multiple hosts reduce their transmission rates. Then, as the congestion clears, the transmission rates are

increased to the point where congestion reoccurs. This cycle of congestion and congestion clearing does not make the best use of the available bandwidth. RED reduces the chance that this issue will occur by selectively dropping packets when the output interface shows signs of congestion. This in turn reduces the chance of global synchronization and makes better use of available bandwidth.

WRED takes RED one step further by providing a way to attach precedence to different traffic streams and hence provide different quality of service to different traffic by dropping more packets from cartain traffic streams than from others.

Use the **set** form of this command to create a random detect QoS policy.

Use the **delete** form of this command to remove a random detect QoS policy.

Use the **show** form of this command to display random detect QoS policy configuration.

traffic-policy random-detect <policy-name> bandwidth

Specifies the bandwidth limit for all combined traffic constrained by this policy.

Syntax

set traffic-policy random-detect *policy-name* **bandwidth** [**auto** | *rate* | *rate-suffix*]

delete traffic-policy random-detect *policy-name* **bandwidth**

show traffic-policy random-detect *policy-name* **bandwidth**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    random-detect policy-name {
        bandwidth [auto | rate | rate-suffix]
    }
}
```

Parameters

policy-name	Mandatory. The name of the random detect policy.
auto	The bandwidth is based on the speed of the interface. This is the default.
rate	The bandwidth, specified in kilobits per second.
rate-suffix	The bandwidth, specified as a number and a scaling suffix (for example, 10mbit). The following suffixes are supported: **kbit**: Kilobits per second. **mbit**: Megabits per second. **gbit**: Gigabits per second. **kbps**: Kilobytes per second. **mbps**: Megabytes per second. **gbps**: Gigabytes per second.

Default

The bandwidth is based on the interface that the policy is applied to.

Usage Guidelines

Use this command to set bandwidth constraints for a random detect QoS policy. This is the maximum bandwidth available for all classes.

Use the **set** form of this command to specify bandwidth constraints for the policy.

Use the **delete** form of this command to restore default bandwidth constraints for the policy.

Use the **show** form of this command to display policy bandwidth configuration.

traffic-policy random-detect <policy-name> description <desc>

Sets a description for a random-detect policy.

Syntax

set traffic-policy random-detect *policy-name* **description** *desc*

delete traffic-policy random-detect *policy-name* **description**

show traffic-policy random-detect *policy-name* **description**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    random-detect policy-name {
        description desc
    }
}
```

Parameters

policy-name	Mandatory. The name of the random detect policy.
desc	The description for this random detect policy.

Default

None.

Usage Guidelines

Use this command to record a description for a random detect policy.

Use the **set** form of this command to specify a description.

Use the **delete** form of this command to remove a description.

Use the **show** form of this command to display description configuration.

traffic-policy random-detect <policy-name> precedence <precedence>

Sets parameters for dropping packets based on precedence for a random-detect policy.

Syntax

set traffic-policy random-detect *policy-name* **precedence** *precedence* [**average-packet** *bytes* | **mark-probability** *probability* | **max-threshold** *max* | **min-probability** *min* | **queue-limit** *packets*]

delete traffic-policy random-detect *policy-name* **precedence** *precedence* [**average-packet** | **mark-probability** | **max-threshold** | **min-probability** | **queue-limit**]

show traffic-policy random-detect *policy-name* **precedence** *precedence* [**average-packet** | **mark-probability** | **max-threshold** | **min-probability** | **queue-limit**]

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    random-detect policy-name {
        precedence precedence {
            average-packet bytes
            mark-probability probability
            max-threshold max
            min-threshold min
            queue-limit packets
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the random detect policy.
bytes	The average packet size in bytes. The default is 1024.
precedence	The IP precedence (the first three bits of the TOS field) of the packet.

probability	The fraction of packets (i.e. 1/probability) dropped when the average queue depth reaches the maximum threshold. The default is 10.
max	All packets are dropped when the average queue depth goes above this threshold. The range is 0 to 4096 packets. The default is 18.
min	Packets begin to be dropped when the average queue depth reaches this threshold. The range is 0 to 4096 packets. The default depends on the *precedence*: Precedence 0 -> min-threshold = 9 Precedence 1-> min-threshold = 10 Precedence 2 -> min-threshold = 11 Precedence 3 -> min-threshold = 12 Precedence 4 -> min-threshold = 13 Precedence 5 -> min-threshold = 14 Precedence 6 -> min-threshold = 15 Precedence 7 -> min-threshold = 16
packets	All packets are dropped when the instantaneous queue depth reaches this threshold. The default is 4 * **max-threshold**.

Default

None.

Usage Guidelines

This feature uses the first three bits of the Type of Service (TOS) field to categorize data streams. Within each of these streams parameters can be set to adjust the rate that packets are dropped when congestion occurs. Each time a packet arrives and is to be sent out the interface a decision is made based on the packet precedence and the parameters set for the specified precedence. If the average output queue size is less than the **min-threshold** then the packet is placed on the output queue. If the average output queue size is between the **min-threshold** and the **max-threshold** the packet may be queued or dropped based on the **probability**. When the average output queue size is larger than **max-threshold** all packets are dropped. When the instantaneous queue size is larger than **queue-limit** all packets are dropped.

If **max-threshold** is set and **min-threshold** is not set then **min-threshold** is automatically scalled to 1/2 **max-threshold**. In addition, the system enforces the constraint that: **min-threshold < max-threshold < queue-limit**.

NOTE *Non IP packets are treated as precedence 0.*

Use this command to specify the packet dropping parameters for a random detect policy.

Use the **set** form of this command to specify the packet dropping parameters for a random detect policy.

Use the **delete** form of this command to remove the packet dropping parameters for a random detect policy.

Use the **show** form of this command to display the packet dropping parameters for a random detect policy.

traffic-policy rate-control <policy-name>

Defines a rate controlling QoS policy.

Syntax

set traffic-policy rate-control *policy-name*

delete traffic-policy rate-control *policy-name*

show traffic-policy rate-control *policy-name*

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    rate-control policy-name {
    }
}
```

Parameters

policy-name	Mandatory. The name of the rate controlling policy.

Default

None.

Usage Guidelines

Use this command to define a rate controlling QoS policy. Rate control policy acts on outbound traffic only. The policy name must be unique and not used with other QoS policy commands.

The Vyatta system uses a version of the Token Bucket Filter (TBF) algorithm. TBF is a classless queuing discipline that only passes packets arriving at a rate which is not exceeding some administratively set rate, but with the possibility to allow short bursts in excess of this rate.

Use the **set** form of this command to create a rate controlling QoS policy.

Use the **delete** form of this command to remove a rate controlling QoS policy.

Use the **show** form of this command to display rate controlling QoS policy configuration.

traffic-policy rate-control <policy-name> bandwidth

Specifies the bandwidth limit for all combined traffic constrained by this policy.

Syntax

set traffic-policy rate-control *policy-name* **bandwidth** [*rate* | *rate-suffix*]

delete traffic-policy rate-control *policy-name* **bandwidth**

show traffic-policy rate-control *policy-name* **bandwidth**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    rate-control policy-name {
        bandwidth [rate | rate-suffix]
    }
}
```

Parameters

policy-name	Mandatory. The name of the rate controlling policy.
rate	The bandwidth, specified in kilobits per second.
rate-suffix	The bandwidth, specified as a number and a scaling suffix (for example, 10mbit). The following suffixes are supported: **kbit**: Kilobits per second. **mbit**: Megabits per second. **gbit**: Gigabits per second. **kbps**: Kilobytes per second. **mbps**: Megabytes per second. **gbps**: Gigabytes per second.

Default

None.

Usage Guidelines

Use this command to set bandwidth constraints for a rate controlling QoS policy. This is the maximum bandwidth available for all classes and must be set.

Use the **set** form of this command to specify bandwidth constraints for the policy.

Use the **delete** form of this command to restore default bandwidth constraints for the policy.

Use the **show** form of this command to display policy bandwidth configuration.

traffic-policy rate-control <policy-name> burst

Sets the burst size for a rate controlling QoS policy.

Syntax

set traffic-policy rate-control *policy-name* **burst** [*num* | *num-suffix*]

delete traffic-policy rate-control *policy-name* **burst**

show traffic-policy rate-control *policy-name* **burst**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    rate-control policy-name {
        burst [num | num-suffix]
    }
}
```

Parameters

policy-name	Mandatory. The name of the rate controlling policy.
num	The burst size, specified in bytes.
num-suffix	The burst size, specified as a number and a scaling suffix (for example, 10mb). The following suffixes are supported: **kb**: Kilobytes. **mb**: Megabytes. **gb**: Gigabytes.

Default

The default burst size is 15 kilobytes.

Usage Guidelines

Use this command to set the burst size for a rate controlling QoS policy. This is the maximum amount of traffic that may be sent at a given time.

Use the **set** form of this command to specify the burst size for a rate controlling QoS policy.

Use the **delete** form of this command to restore the default burst size for a rate controlling QoS policy.

Use the **show** form of this command to display rate control burst size configuration.

traffic-policy rate-control <policy-name> description <desc>

Sets a description for a rate controlling policy.

Syntax

set traffic-policy rate-control *policy-name* **description** *desc*

delete traffic-policy rate-control *policy-name* **description**

show traffic-policy rate-control *policy-name* **description**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    rate-control policy-name {
        description desc
    }
}
```

Parameters

policy-name	Mandatory. The name of the rate control policy.
desc	The description for this rate control policy.

Default

None.

Usage Guidelines

Use this command to record a description for a rate control policy.

Use the **set** form of this command to specify a description.

Use the **delete** form of this command to remove a description.

Use the **show** form of this command to display description configuration.

traffic-policy rate-control <policy-name> latency

Sets the limit on queue size based on latency for a rate controlling QoS policy.

Syntax

set traffic-policy rate-control *policy-name* **latency** [*num* | *num-suffix]*

delete traffic-policy rate-control *policy-name* **latency**

show traffic-policy rate-control *policy-name* **latency**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    rate-control policy-name {
        latency [num | num-suffix]
    }
}
```

Parameters

policy-name	Mandatory. The name of the rate controlling policy.
num	The latency, specified in milliseconds.
num-suffix	The latency, specified as a time and a scaling suffix (for example, 10ms). The following suffixes are supported: **secs**: Seconds. **ms**: Milliseconds. **us**: Microseconds.

Default

The default latency is 50 milliseconds.

Usage Guidelines

Use this command to set the latency for a rate controlling QoS policy. This is the maximum amount of time a packet can sit in the Token Bucket Filter.

Use the **set** form of this command to specify the latency for a rate controlling QoS policy.

Use the **delete** form of this command to restore the default latency for a rate controlling QoS policy.

Use the **show** form of this command to display rate control latency configuration.

traffic-policy round-robin <policy-name>

Defines a round robin QoS policy.

Syntax

set traffic-policy round-robin *policy-name*

delete traffic-policy round-robin *policy-name*

show traffic-policy round-robin *policy-name*

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.

Default

None.

Usage Guidelines

Use this command to define a round robin QoS policy. Round robin policy acts on outbound traffic only. The policy name must be unique and not used with other QoS policy commands. The round robin policy provides round-robin fairness to all classes. The difference between **shaper** and **round-robin** is that **shaper** limits bandwidth usage by class and then allocates any leftover bandwidth. **Round-robin**, on the other hand, attempts to divide all available bandwidth between the defined classes.

Use the **set** form of this command to create a round robin QoS policy.

Use the **delete** form of this command to remove a round robin QoS policy.

Use the **show** form of this command to display round robin QoS policy configuration.

traffic-policy round-robin <policy-name> class <class>

Defines a traffic class for a round robin QoS policy.

Syntax

set traffic-policy round-robin *policy-name* **class** *class*

delete traffic-policy round-robin *policy-name* **class** *class*

show traffic-policy round-robin *policy-name* **class** *class*

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        class class {
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.
class	Mandatory. The class ID. The range is 2 to 4095.

Default

None.

Usage Guidelines

Use this command to define a traffic class for a round robin QoS policy. This allows packets to be grouped into various traffic classes, which can be treated with different levels of service.

Use the **set** form of this command to create a traffic class in a round robin QoS policy.

Use the **delete** form of this command to remove a traffic class from a round robin QoS policy.

Use the **show** form of this command to display traffic class configuration within a round robin QoS policy.

traffic-policy round-robin <policy-name> class <class> description <desc>

Sets a description for a traffic class.

Syntax

set traffic-policy round-robin *policy-name* **class** *class* **description** *desc*

delete traffic-policy round-robin *policy-name* **class** *class* **description**

show traffic-policy round-robin *policy-name* **class** *class* **description**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        class class {
            description desc
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.
class	Mandatory. The class ID. The range is 2 to 4095.
desc	The description for this traffic class.

Default

None.

Usage Guidelines

Use this command to record a description for a traffic class.

Use the **set** form of this command to specify a description.

Use the **delete** form of this command to remove a description.

Use the **show** form of this command to display description configuration.

traffic-policy round-robin <policy-name> class <class> match <match-name>

Defines a traffic class matching rule.

Syntax

set traffic-policy round-robin *policy-name* **class** *class* **match** *match-name*

delete traffic-policy round-robin *policy-name* **class** *class* **match** *match-name*

show traffic-policy round-robin *policy-name* **class** *class* **match** *match-name*

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        class class {
            match match-name {
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.

Default

None.

Usage Guidelines

Use this command to define a rule setting out the match conditions for membership in a traffic class.

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to create the traffic class matching rule.

Use the **delete** form of this command to remove the traffic class matching rule configuration node.

Use the **show** form of this command to display traffic class matching rule configuration.

traffic-policy round-robin <policy-name> class <class> match <match-name> description <desc>

Sets a description for a match rule.

Syntax

set traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **description** *desc*

delete traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **description**

show traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **description**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        class class {
            match match-name {
                description desc
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
desc	The description for this match.

Default

None.

Usage Guidelines

Use this command to record a description for a traffic class matching rule.

Use the **set** form of this command to set the description.

Use the **delete** form of this command to remove the description.

Use the **show** form of this command to display description configuration.

traffic-policy round-robin <policy-name> class <class> match <match-name> ether destination <mac-addr>

Specifies a match criterion based on Ethernet destination (MAC) address.

Syntax

set traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ether destination** *mac-addr*

delete traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ether destination**

show traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ether destination**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        class class {
            match match-name {
                ether {
                    destination mac-addr
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
mac-addr	Performs a match based on the destination MAC address on the interface the policy is applied to.The format is 6 colon-spearated 8-bit numbers in hexidecimal; for example, 00:0a:59:9a:f2:ba.

Default

If not set, packets are not matched against the destination MAC address.

Usage Guidelines

Use this command to define a match condition based on destination MAC address for a traffic class.

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to specify a destination to be matched.

Use the **delete** form of this command to remove destination as a match condition.

Use the **show** form of this command to display destination match condition configuration.

traffic-policy round-robin <policy-name> class <class> match <match-name> ether protocol <num>

Specifies a match criterion based on Ethernet packet type.

Syntax

set traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ether protocol** *num*

delete traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ether protocol**

show traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ether protocol**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        class class {
            match match-name {
                ether {
                    protocol num
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
num	Performs a match based on the Ethernet packet type (i.e. protocol number). The range is 0 to 65535.

Default

If not set, packets are not matched against the Ethernet packet type.

Usage Guidelines

Use this command to define a match condition based on Ethernet packet type for a traffic class.

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to specify the packet type to be matched.

Use the **delete** form of this command to remove packet type as a match condition.

Use the **show** form of this command to display packet type match condition configuration.

traffic-policy round-robin <policy-name> class <class> match <match-name> ether source <mac-addr>

Specifies a match criterion based on Ethernet source (MAC) address.

Syntax

set traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ether source** *mac-addr*

delete traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ether source**

show traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ether source**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        class class {
            match match-name {
                ether {
                    source mac-addr
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
mac-addr	Performs a match based on the MAC address of the interface the policy is applied to. The format is 6 colon-spearated 8-bit numbers in hexidecimal; for example, 00:0a:59:9a:f2:ba.

Default

If not set, packets are not matched against the source MAC address.

Usage Guidelines

Use this command to define a match condition based on source MAC address for a traffic class.

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to specify a source to be matched.

Use the **delete** form of this command to remove source as a match condition.

Use the **show** form of this command to display source match condition configuration.

traffic-policy round-robin <policy-name> class <class> match <match-name> interface <interface>

Specifies a match criterion based on incoming interface.

Syntax

set traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **interface** *interface*

delete traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **interface**

show traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **interface**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        class class {
            match match-name {
                interface interface
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
interface	Performs a match based on the specified Ethernet interface name. The ingress interface for incoming traffic will be compared with this value.

Default

None.

Usage Guidelines

Use this command to set a match condition for a traffic class based on incoming interface.

If incoming packets ingress through the interface specified by this command, the traffic is a member of this traffic class (provided other match conditions are satisfied).

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to specify an interface to be matched by incoming packets.

Use the **delete** form of this command to remove the match interface.

Use the **show** form of this command to display interface match configuration.

traffic-policy round-robin <policy-name> class <class> match <match-name> ip destination

Specifies a match criterion based on IP destination information.

Syntax

set traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ip destination** {**address** *ipv4net* | **port** *port*}

delete traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ip destination** [**address** | **port**]

show traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ip destination**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        class class {
            match match-name {
                ip {
                    destination {
                        address ipv4net
                        port port
                    }
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.

ipv4net	Performs a match based on the destination IP subnet address.
port	Performs a match based on destination port. The port may be specified as a lower-case name (for example **ssh**) or as a number. The range for port numbers is 0 to 65535.

Default

If not set, packets are not matched against destination information.

Usage Guidelines

Use this command to define a match condition based on destination subnet address and/or port for a traffic class.

You can match packets based on a destination represented by either or both of IP subnet address and destination port(s).

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to specify a destination to be matched.

Use the **delete** form of this command to remove destination as a match condition.

Use the **show** form of this command to display destination match condition configuration.

traffic-policy round-robin <policy-name> class <class> match <match-name> ip dscp <value>

Specifies a match criterion based on the value of the DSCP field.

Syntax

set traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ip dscp** *value*

delete traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ip dscp**

show traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ip dscp**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        class class {
            match match-name {
                ip {
                    dscp value
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.

value	Performs a match based on the specified value. This value is compared with the value in the DSCP field of the ToS byte in the IP header. The DSCP value can be specified as a decimal number (for example, 12), as a hexidecimal number (for example 0x1D), or as a standard name from **/etc/iproute2/rt_dsfield** (for example, **lowdelay**).

Default

If not set, packets are not matched against DSCP value.

Usage Guidelines

Use this command to define a match condition based on the Differentiated Services Code Point (DSCP) field.

The DSCP field is a 6-bit field in the Type of Service (ToS) byte of the IP header. It provides a way of marking packets in order to allow classification of traffic into service classes, and traffic conditioning such as metering, policing, and shaping.

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to set a match condition based on DSCP value.

Use the **delete** form of this command to remove DSCP as a match condition.

Use the **show** form of this command to display DSCP value configuration.

traffic-policy round-robin <policy-name> class <class> match <match-name> ip protocol <proto>

Specifies a match criterion based on the IP protocol.

Syntax

set traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ip protocol** *proto*

delete traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ip protocol**

show traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ip protocol**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        class class {
            match match-name {
                ip {
                    protocol proto
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
proto	Performs a match based on the protocol name (for example, **icmp**) or number, as assigned by the IANA.

Default

If not set, packets are not matched against IP protocol.

Usage Guidelines

Use this command to define a match condition for a traffic class based on protocol.

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to set a match condition based on protocol.

Use the **delete** form of this command to remove protocol value as a match condition.

Use the **show** form of this command to match condition protocol configuration.

traffic-policy round-robin <policy-name> class <class> match <match-name> ip source

Specifies a match criterion based on source IP information.

Syntax

set traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ip source** {**address** *ipv4net* | **port** *port*}

delete traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ip source** {**address** | **port**}

show traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ip source**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        class class {
            match match-name {
                ip {
                    source {
                        address ipv4net
                        port port
                    }
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
ipv4net	The source IP subnet address to match for this rule.

port	The source port to match for this rule. The port may be specified as a lower-case name (for example **ssh**) or as a number. The range for port numbers is 0 to 65535.

Default

If not set, packets are not matched against IP source information.

Usage Guidelines

Use this command to define a match condition based on source subnet address and/or port for a traffic class.

You can match packets based on a source represented by either or both of IP subnet address and destination port(s).

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to specify a source to be matched.

Use the **delete** form of this command to remove source as a match condition.

Use the **show** form of this command to display source match condition configuration.

traffic-policy round-robin <policy-name> class <class> match <match-name> ipv6 destination

Specifies a match criterion based on IPv6 destination information.

Syntax

set traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ipv6 destination** {**address** *ipv6net* | **port** *port*}

delete traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ipv6 destination** [**address** | **port**]

show traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ipv6 destination**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        class class {
            match match-name {
                ipv6 {
                    destination {
                        address ipv6net
                        port port
                    }
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round-robin policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.

ipv6net	Performs a match based on the destination IPv6 subnet address.
port	Performs a match based on destination port. The port may be specified as a lower-case name (for example **ssh**) or as a number. The range for port numbers is 0 to 65535.

Default

If not set, packets are not matched against destination information.

Usage Guidelines

Use this command to define a match condition based on destination subnet address and/or port for a traffic class.

You can match packets based on a destination represented by either or both of IPv6 subnet address and destination port(s).

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to specify a destination to be matched.

Use the **delete** form of this command to remove destination as a match condition.

Use the **show** form of this command to display destination match condition configuration.

traffic-policy round-robin <policy-name> class <class> match <match-name> ipv6 dscp <value>

Specifies a match criterion based on the value of the DSCP field.

Syntax

set traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ipv6 dscp** *value*

delete traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ipv6 dscp**

show traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ipv6 dscp**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        class class {
            match match-name {
                ipv6 {
                    dscp value
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.

value	Performs a match based on the specified value. This value is compared with the value in the DSCP field of the ToS byte in the IP header. The DSCP value can be specified as a decimal number (for example, 12), as a hexidecimal number (for example 0x1D), or as a standard name from **/etc/iproute2/rt_dsfield** (for example, **lowdelay**).

Default

If not set, packets are not matched against DSCP value.

Usage Guidelines

Use this command to define a match condition based on the Differentiated Services Code Point (DSCP) field.

The DSCP field is a 6-bit field in the Type of Service (ToS) byte of the IP header. It provides a way of marking packets in order to allow classification of traffic into service classes, and traffic conditioning such as metering, policing, and shaping.

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to set a match condition based on DSCP value.

Use the **delete** form of this command to remove DSCP as a match condition.

Use the **show** form of this command to display DSCP value configuration.

traffic-policy round-robin <policy-name> class <class> match <match-name> ipv6 protocol <proto>

Specifies a match criterion based on the IPv6 protocol.

Syntax

set traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ipv6 protocol** *proto*

delete traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ipv6 protocol**

show traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ipv6 protocol**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        class class {
            match match-name {
                ipv6 {
                    protocol proto
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
proto	Performs a match based on the protocol name (for example, **icmp**) or number, as assigned by the IANA.

Default

If not set, packets are not matched against IP protocol.

Usage Guidelines

Use this command to define a match condition for a traffic class based on protocol.

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to set a match condition based on protocol.

Use the **delete** form of this command to remove protocol value as a match condition.

Use the **show** form of this command to match condition protocol configuration.

traffic-policy round-robin <policy-name> class <class> match <match-name> ipv6 source

Specifies a match criterion based on source IPv6 information.

Syntax

set traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ipv6 source** {**address** *ipv6net* | **port** *port*}

delete traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ipv6 source** {**address** | **port**}

show traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **ipv6 source**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        class class {
            match match-name {
                ipv6 {
                    source {
                        address ipv6net
                        port port
                    }
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 3 to 4095.
match-name	Mandatory. Class matching rule name.

ipv6net	The source IPv6 subnet address to match for this rule.
port	The source port to match for this rule. The port may be specified as a lower-case name (for example **ssh**) or as a number. The range for port numbers is 0 to 65535.

Default

If not set, packets are not matched against IPv6 source information.

Usage Guidelines

Use this command to define a match condition based on source subnet address and/or port for a traffic class.

You can match packets based on a source represented by either or both of IPv6 subnet address and destination port(s).

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to specify a source to be matched.

Use the **delete** form of this command to remove source as a match condition.

Use the **show** form of this command to display source match condition configuration.

traffic-policy round-robin <policy-name> class <class> match <match-name> vif <vlan-id>

Specifies a a match criterion based on VLAN ID.

Syntax

set traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **vif** *vlan-id*

delete traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **vif**

show traffic-policy round-robin *policy-name* **class** *class* **match** *match-name* **vif**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        class class {
            match match-name {
                vif vlan-id
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round-robin policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
vlan-id	Performs a match based on VLAN ID. The range is 1 to 4096.

Default

If not set, packets are not matched against VLAN ID.

Usage Guidelines

Use this command to define a match condition based on VLAN ID for a traffic class.

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to specify a VLAN ID to be matched.

Use the **delete** form of this command to remove VLAN ID as a match condition.

Use the **show** form of this command to display VLAN ID match condition configuration.

traffic-policy round-robin <policy-name> class <class> quantum <packets>

Specifies the number of packets that can be sent per scheduling quantum for a traffic class.

Syntax

set traffic-policy round-robin *policy-name* **class** *class* **quantum** *packets*

delete traffic-policy round-robin *policy-name* **class** *class* **quantum**

show traffic-policy round-robin *policy-name* **class** *class* **quantum**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        class class {
            quantum packets
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.
class	Mandatory. The class ID. The range is 2 to 4095.
packets	Optional. The number of packets that can be sent per scheduling quantum.

Default

None.

Usage Guidelines

Use this command to set the number of packets that can be sent per scheduling quantum for a round robin QoS traffic class policy.

Use the **set** form of this command to specify the number of packets that can be sent per scheduling quantum.

Use the **delete** form of this command to remove the quantum configuration.

Use the **show** form of this command to display the quantum configuration.

traffic-policy round-robin <policy-name> class <class> queue-limit <limit>

Specifies the maximum queue size for a traffic class.

Syntax

set traffic-policy round-robin *policy-name* **class** *class* **queue-limit** *limit*

delete traffic-policy round-robin *policy-name* **class** *class* **queue-limit**

show traffic-policy round-robin *policy-name* **class** *class* **queue-limit**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        class class {
            queue-limit limit
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.
class	Mandatory. The class ID. The range is 2 to 4095.
limit	The maximum queue size in packets.

Default

The default limit is 127.

Usage Guidelines

Use this command to set the maximum queue size (in packets) for a traffic class.

Use the **set** form of this command to specify the queue limit.

Use the **delete** form of this command to remove queue limit.

Use the **show** form of this command to display queue limit configuration.

traffic-policy round-robin <policy-name> class <class> queue-type <type>

Specifies the type of queuing to use for a traffic class.

Syntax

set traffic-policy round-robin *policy-name* **class** *class* **queue-type** *type*

delete traffic-policy round-robin *policy-name* **class** *class* **queue-type**

show traffic-policy round-robin *policy-name* **class** *class* **queue-type**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        class class {
            queue-type type
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.
class	Mandatory. The class ID. The range is 2 to 4095.
type	The queuing method to use. Supported values are as follows: **fair-queue**: Uses a Stochastic Fair Queue (SFQ) queue. **drop-tail**: Uses a First In First Out (FIFO) queue. **priority**: Sets queue priority based on the Differentiated Services Code Point (DSCP) values in the Type of Service (ToS) byte of the IP header.

Default

The default is **drop-tail**.

Usage Guidelines

Use this command to set the type of queuing mechanism to use for a traffic class.

Use the **set** form of this command to specify the queue type.

Use the **delete** form of this command to restore the default queue type.

Use the **show** form of this command to display queue type configuration.

traffic-policy round-robin <policy-name> default

Defines a default round robin QoS policy.

Syntax

set traffic-policy round-robin *policy-name* **default**

delete traffic-policy round-robin *policy-name* **default**

show traffic-policy round-robin *policy-name* **default**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        default {
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round-robin policy.

Default

None.

Usage Guidelines

Use this command to define a defaultround robin policy. This policy will be applied to all traffic that does not match any other defined class.

Use the **set** form of this command to create the default class configuration node.

Use the **delete** form of this command to remove the default class configuration node.

Use the **show** form of this command to display the default class configuration node.

traffic-policy round-robin <policy-name> default quantum <packets>

Specifies the number of packets that can be sent per scheduling quantum.

Syntax

set traffic-policy round-robin *policy-name* **default quantum** *packets*

delete traffic-policy round-robin *policy-name* **default quantum**

show traffic-policy round-robin *policy-name* **default quantum**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        default {
            quantum packets
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.
packets	Optional. The number of packets that can be sent per scheduling quantum.

Default

None.

Usage Guidelines

Use this command to set the number of packets that can be sent per scheduling quantum for a round robin QoS default policy.

Use the **set** form of this command to specify the number of packets that can be sent per scheduling quantum.

Use the **delete** form of this command to remove the quantum configuration.

Use the **show** form of this command to display the quantum configuration.

traffic-policy round-robin <policy-name> default queue-limit <limit>

Specifies the maximum queue size for the default traffic class.

Syntax

set traffic-policy round-robin *policy-name* **default queue-limit** *limit*

delete traffic-policy round-robin *policy-name* **default queue-limit**

show traffic-policy round-robin *policy-name* **default queue-limit**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        default {
            queue-limit limit
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.
limit	The maximum queue size in packets.

Default

None.

Usage Guidelines

Use this command to set the maximum queue size (in packets) for the default class.

Use the **set** form of this command to specify the queue limit.

Use the **delete** form of this command to remove queue limit.

Use the **show** form of this command to display queue limit configuration.

traffic-policy round-robin <policy-name> default queue-type <type>

Specifies the type of queuing to use for the default traffic class.

Syntax

set traffic-policy round-robin *policy-name* **default queue-type** *type*

delete traffic-policy round-robin *policy-name* **default queue-type**

show traffic-policy round-robin *policy-name* **default queue-type**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        default {
            queue-type type
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the round-robin policy.
type	The queuing method to use. Supported values are as follows: **fair-queue**: Uses a Stochastic Fair Queue (SFQ) queue. **drop-tail**: Uses a First In First Out (FIFO) queue. **priority**: Sets queue priority based on the Differentiated Services Code Point (DSCP) values in the Type of Service (ToS) byte of the IP header.

Default

The default is **fair-queue**.

Usage Guidelines

Use this command to set the type of queuing mechanism to use for the default traffic class.

Use the **set** form of this command to specify the queue type.

Use the **delete** form of this command to restore the default queue type.

Use the **show** form of this command to display queue type configuration.

traffic-policy round-robin <policy-name> description <desc>

Specifies a description for a round-robin QoS policy.

Syntax

set traffic-policy round-robin *policy-name* **description** *desc*

delete traffic-policy round-robin *policy-name* **description**

show traffic-policy round-robin *policy-name* **description**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    round-robin policy-name {
        description desc
    }
}
```

Parameters

policy-name	Mandatory. The name of the round robin policy.
desc	The description for this round robin policy.

Default

None.

Usage Guidelines

Use this command to record a description for a round robin policy.

Use the **set** form of this command to specify a description for a round robin policy.

Use the **delete** form of this command to remove a description from a round robin policy.

Use the **show** form of this command to display description configuration for a round robin policy.

traffic-policy shaper <policy-name>

Defines a traffic shaping QoS policy.

Syntax

set traffic-policy shaper *policy-name*

delete traffic-policy shaper *policy-name*

show traffic-policy shaper *policy-name*

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.

Default

None.

Usage Guidelines

Use this command to define a traffic shaper QoS policy. Traffic shaper policy acts on outbound traffic only. The policy name must be unique and not used with other QoS policy commands.

The Vyatta system uses a version of the Token Bucket traffic shaping algorithm. The Token Bucket algorithm places a limit on the average traffic transmission rate, but allows controlled bursting on the network. The Token Bucket algorithm provides the ability to control bandwidth for VoIP, or limit bandwidth consumption for peer-to-peer applications.

In the Token Bucket algorithm, each flow has a certain number of tokens in its "bucket," and transmitting traffic "spends" these tokens. If the token bucket is empty, the flow is not permitted to send packets.

This method allows a network administrator to control the amount of bandwidth allocated to different types of traffic. This method also allows a flow to burst traffic, provided it has enough tokens in its bucket.

The difference between **shaper** and **round-robin** is that **shaper** limits bandwidth usage by class and then allocates any leftover bandwidth. **Round-robin**, on the other hand, attempts to divide all available bandwidth between the defined classes.

Use the **set** form of this command to create a traffic shaper QoS policy.

Use the **delete** form of this command to remove a traffic shaper QoS policy.

Use the **show** form of this command to display traffic shaper QoS policy configuration.

traffic-policy shaper <policy-name> bandwidth

Specifies the bandwidth available for all combined traffic constrained by this policy.

Syntax

set traffic-policy shaper *policy-name* **bandwidth** [**auto** | *rate* | *rate-suffix*]

delete traffic-policy shaper *policy-name* **bandwidth**

show traffic-policy shaper *policy-name* **bandwidth**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        bandwidth [auto | rate | rate-suffix]
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
auto	Automatically bases the bandwidth on the interface speed.
rate	The bandwidth, specified in kilobits per second.
rate-suffix	The bandwidth, specified as a number and a scaling suffix (for example, 10mbit). The following suffixes are supported: **kbit**: Kilobits per second. **mbit**: Megabits per second. **gbit**: Gigabits per second. **kbps**: Kilobytes per second. **mbps**: Megabytes per second. **gbps**: Gigabytes per second.

Default

The default is **auto**.

Usage Guidelines

Use this command to set bandwidth constraints for a traffic shaper QoS policy. This is the maximum bandwidth available for all classes.

Use the **set** form of this command to specify bandwidth constraints for the policy.

Use the **delete** form of this command to restore default bandwidth constraints for the policy.

Use the **show** form of this command to display policy bandwidth configuration.

traffic-policy shaper <policy-name> class <class>

Defines a traffic class for a traffic shaper QoS policy.

Syntax

set traffic-policy shaper *policy-name* **class** *class*

delete traffic-policy shaper *policy-name* **class** *class*

show traffic-policy shaper *policy-name* **class** *class*

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.

Default

None.

Usage Guidelines

Use this command to define a traffic class for a traffic shaper QoS policy. This allows packets to be grouped into various traffic classes, which can be treated with different levels of service.

Use the **set** form of this command to create a traffic class in a traffic shaper QoS policy.

Use the **delete** form of this command to remove a traffic class from a traffic shaper QoS policy.

Use the **show** form of this command to display traffic class configuration within a traffic shaper QoS policy.

traffic-policy shaper <policy-name> class <class> bandwidth

Specifies the base guaranteed bandwidth rate for a traffic class.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **bandwidth** [*rate* | *rate-pct* | *rate-suffix*]

delete traffic-policy shaper *policy-name* **class** *class* **bandwidth**

show traffic-policy shaper *policy-name* **class** *class* **bandwidth**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            bandwidth [rate | rate-pct | rate-suffix]
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
rate	The bandwidth, specified in kilobits per second.
rate-pct	The bandwidth, specified as a percentage of the overall bandwidth rate. The format is *num*% (for example, 85%).

rate-suffix	The bandwidth, specified as a number and a scaling suffix (for example, 10mbit). The following suffixes are supported: **kbit**: Kilobits per second. **mbit**: Megabits per second. **gbit**: Gigabits per second. **kbps**: Kilobytes per second. **mbps**: Megabytes per second. **gbps**: Gigabytes per second.

Default

100% bandwidth usage is available.

Usage Guidelines

Use this command to set a base level of guaranteed bandwidth for a traffic class.

Use the **set** form of this command to set the available bandwidth for the traffic class.

Use the **delete** form of this command to restore the default available bandwidth for the traffic class.

Use the **show** form of this command to display class bandwidth configuration.

traffic-policy shaper <policy-name> class <class> burst

Sets the burst size for a traffic class.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **burst** [*num* | *num-suffix*]

delete traffic-policy shaper *policy-name* **class** *class* **burst**

show traffic-policy shaper *policy-name* **class** *class* **burst**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            burst [num | num-suffix]
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
num	The burst size, specified in bytes.
num-suffix	The burst size, specified as a number and a scaling suffix (for example, 10mb). The following suffixes are supported: **kb**: Kilobytes. **mb**: Megabytes. **gb**: Gigabytes.

Default

The burst size is 15 kilobytes.

Usage Guidelines

Use this command to set the burst size for the traffic class. This is the maximum amount of traffic that may be sent at a given time.

Use the **set** form of this command to specify the burst size for a traffic class.

Use the **delete** form of this command to restore the default burst size for a traffic class.

Use the **show** form of this command to display traffic class burst size configuration.

traffic-policy shaper <policy-name> class <class> ceiling

Sets a bandwidth ceiling for a traffic class.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **ceiling** [*rate* | *rate-pct* | *rate-suffix*]

delete traffic-policy shaper *policy-name* **class** *class* **ceiling**

show traffic-policy shaper *policy-name* **class** *class* **ceiling**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            ceiling [rate | rate-pct | rate-suffix]
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
rate	The maximum bandwidth, specified in kilobits per second.
rate-pct	The maximum bandwidth, specified as a percentage of the interface speed. The format is *num*% (for example, 85%).
rate-suffix	The bandwidth, specified as a number and a scaling suffix (for example, 10mbit). The following suffixes are supported: **kbit**: Kilobits per second. **mbit**: Megabits per second. **gbit**: Gigabits per second.

Default

The default is the specified bandwidth for the class.

Usage Guidelines

Use this command to set the maximum amount of bandwidth a traffic class may consume when excess bandwidth is available.

Use the **set** form of this command to set the bandwidth ceiling for a traffic class.

Use the **delete** form of this command to restore the default bandwidth ceiling for a traffic class.

Use the **show** form of this command to display traffic class bandwidth ceiling configuration.

traffic-policy shaper <policy-name> class <class> description <desc>

Sets a description for a traffic class.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **description** *desc*

delete traffic-policy shaper *policy-name* **class** *class* **description**

show traffic-policy shaper *policy-name* **class** *class* **description**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            description desc
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
desc	The description for this traffic class.

Default

None.

Usage Guidelines

Use this command to record a description for a traffic class.

Use the **set** form of this command to specify a description.

Use the **delete** form of this command to remove a description.

Use the **show** form of this command to display description configuration.

traffic-policy shaper <policy-name> class <class> match <match-name>

Defines a traffic class matching rule.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **match** *match-name*

delete traffic-policy shaper *policy-name* **class** *class* **match** *match-name*

show traffic-policy shaper *policy-name* **class** *class* **match** *match-name*

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            match match-name {
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.

Default

None.

Usage Guidelines

Use this command to define a rule setting out the match conditions for membership in a traffic class.

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this comm and to create the traffic class matching rule. Note that you cannot use **set** to change the name of an existing traffic class matching rule. To change the rule, delete it and re-create it.

Use the **delete** form of this command to remove the traffic class matching rule configuration node.

Use the **show** form of this command to display traffic class matching rule configuration.

traffic-policy shaper <policy-name> class <class> match <match-name> description <desc>

Sets a description for a match rule.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **description** *desc*

delete traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **description**

show traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **description**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            match match-name {
                description desc
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
desc	The description for this match.

Default

None.

Usage Guidelines

Use this command to record a description for a traffic class matching rule.

Use the **set** form of this command to set the description.

Use the **delete** form of this command to remove the description.

Use the **show** form of this command to display description configuration.

traffic-policy shaper <policy-name> class <class> match <match-name> ether destination <mac-addr>

Specifies a match criterion based on Ethernet destination (MAC) address.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ether destination** *mac-addr*

delete traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ether destination**

show traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ether destination**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            match match-name {
                ether {
                    destination mac-addr
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.

mac-addr	Performs a match based on the destination MAC address on the interface the policy is applied to. The format is 6 colon-spearated 8-bit numbers in hexidecimal; for example, 00:0a:59:9a:f2:ba.

Default

If not set, packets are not matched against the destination MAC address.

Usage Guidelines

Use this command to define a match condition based on destination MAC address for a traffic class.

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to specify a destination to be matched.

Use the **delete** form of this command to remove destination as a match condition.

Use the **show** form of this command to display destination match condition configuration.

traffic-policy shaper <policy-name> class <class> match <match-name> ether protocol <num>

Specifies a match criterion based on Ethernet packet type.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ether protocol** *num*

delete traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ether protocol**

show traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ether protocol**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            match match-name {
                ether {
                    protocol num
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
num	Performs a match based on the Ethernet packet type (i.e. protocol number). The range is 0 to 65535.

Default

If not set, packets are not matched against the Ethernet packet type.

Usage Guidelines

Use this command to define a match condition based on Ethernet packet type for a traffic class.

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to specify the packet type to be matched.

Use the **delete** form of this command to remove packet type as a match condition.

Use the **show** form of this command to display packet type match condition configuration.

traffic-policy shaper <policy-name> class <class> match <match-name> ether source <mac-addr>

Specifies a match criterion based on Ethernet source (MAC) address.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ether source** *mac-addr*

delete traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ether source**

show traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ether source**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            match match-name {
                ether {
                    source mac-addr
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
mac-addr	Performs a match based on the MAC address of the interface the policy is applied to. The format is 6 colon-spearated 8-bit numbers in hexidecimal; for example, 00:0a:59:9a:f2:ba.

Default

If not set, packets are not matched against the source MAC address.

Usage Guidelines

Use this command to define a match condition based on source MAC address for a traffic class.

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to specify a source to be matched.

Use the **delete** form of this command to remove source as a match condition.

Use the **show** form of this command to display source match condition configuration.

traffic-policy shaper <policy-name> class <class> match <match-name> interface <interface>

Specifies a match criterion based on incoming interface.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **interface** *interface*

delete traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **interface**

show traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **interface**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            match match-name {
                interface interface
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
interface	Performs a match based on the specified Ethernet interface name. The ingress interface for incoming traffic will be compared with this value.

Default

None.

Usage Guidelines

Use this command to set a match condition for a traffic class based on incoming interface.

If incoming packets ingress through the interface specified by this command, the traffic is a member of this traffic class (provided other match conditions are satisfied).

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to specify an interface to be matched by incoming packets.

Use the **delete** form of this command to remove the match interface.

Use the **show** form of this command to display interface match configuration.

traffic-policy shaper <policy-name> class <class> match <match-name> ip destination

Specifies a match criterion based on IP destination information.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ip destination** {**address** *ipv4net* | **port** *port*}

delete traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ip destination** [**address** | **port**]

show traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ip destination**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            match match-name {
                ip {
                    destination {
                        address ipv4net
                        port port
                    }
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
ipv4net	Performs a match based on the destination IP subnet address.

port	Performs a match based on destination port. The port may be specified as a lower-case name (for example **ssh**) or as a number. The range for port numbers is 0 to 65535.

Default

If not set, packets are not matched against destination information.

Usage Guidelines

Use this command to define a match condition based on destination subnet address and/or port for a traffic class.

You can match packets based on a destination represented by either or both of IP subnet address and destination port(s).

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to specify a destination to be matched.

Use the **delete** form of this command to remove destination as a match condition.

Use the **show** form of this command to display destination match condition configuration.

traffic-policy shaper <policy-name> class <class> match <match-name> ip dscp <value>

Specifies a match criterion based on the value of the DSCP field.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ip dscp** *value*

delete traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ip dscp**

show traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ip dscp**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            match match-name {
                ip {
                    dscp value
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
value	Performs a match based on the specified value. This value is compared with the value in the DSCP field of the ToS byte in the IP header. The DSCP value can be specified as a decimal number (for example, 12), as a hexidecimal number (for example 0x1D), or as a standard name from **/etc/iproute2/rt_dsfield** (for example, **lowdelay**).

Default

If not set, packets are not matched against DSCP value.

Usage Guidelines

Use this command to define a match condition based on the Differentiated Services Code Point (DSCP) field.

The DSCP field is a 6-bit field in the Type of Service (ToS) byte of the IP header. It provides a way of marking packets in order to allow classification of traffic into service classes, and traffic conditioning such as metering, policing, and shaping.

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to set a match condition based on DSCP value.

Use the **delete** form of this command to remove DSCP as a match condition.

Use the **show** form of this command to display DSCP value configuration.

traffic-policy shaper <policy-name> class <class> match <match-name> ip protocol <proto>

Specifies a match criterion based on the IP protocol.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ip protocol** *proto*

delete traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ip protocol**

show traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ip protocol**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            match match-name {
                ip {
                    protocol proto
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
proto	Performs a match based on the protocol name (for example, **icmp**) or number, as assigned by the IANA.

Default

If not set, packets are not matched against IP protocol.

Usage Guidelines

Use this command to define a match condition for a traffic class based on protocol.

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to set a match condition based on protocol.

Use the **delete** form of this command to remove protocol value as a match condition.

Use the **show** form of this command to match condition protocol configuration.

traffic-policy shaper <policy-name> class <class> match <match-name> ip source

Specifies a match criterion based on source IP information.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ip source** {**address** *ipv4net* | **port** *port*}

delete traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ip source** {**address** | **port**}

show traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ip source**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            match match-name {
                ip {
                    source {
                        address ipv4net
                        port port
                    }
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
ipv4net	The source IP subnet address to match for this rule.

port	The source port to match for this rule. The port may be specified as a lower-case name (for example **ssh**) or as a number. The range for port numbers is 0 to 65535.

Default

If not set, packets are not matched against IP source information.

Usage Guidelines

Use this command to define a match condition based on source subnet address and/or port for a traffic class.

You can match packets based on a source represented by either or both of IP subnet address and destination port(s).

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to specify a source to be matched.

Use the **delete** form of this command to remove source as a match condition.

Use the **show** form of this command to display source match condition configuration.

traffic-policy shaper <policy-name> class <class> match <match-name> ipv6 destination

Specifies a match criterion based on IPv6 destination information.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ipv6 destination** {**address** *ipv6net* | **port** *port*}

delete traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ipv6 destination** [**address** | **port**]

show traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ipv6 destination**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            match match-name {
                ipv6 {
                    destination {
                        address ipv6net
                        port port
                    }
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.

ipv6net	Performs a match based on the destination IPv6 subnet address.
port	Performs a match based on destination port. The port may be specified as a lower-case name (for example **ssh**) or as a number. The range for port numbers is 0 to 65535.

Default

If not set, packets are not matched against destination information.

Usage Guidelines

Use this command to define a match condition based on destination subnet address and/or port for a traffic class.

You can match packets based on a destination represented by either or both of IPv6 subnet address and destination port(s).

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to specify a destination to be matched.

Use the **delete** form of this command to remove destination as a match condition.

Use the **show** form of this command to display destination match condition configuration.

traffic-policy shaper <policy-name> class <class> match <match-name> ipv6 dscp <value>

Specifies a match criterion based on the value of the DSCP field.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ipv6 dscp** *value*

delete traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ipv6 dscp**

show traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ipv6 dscp**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            match match-name {
                ipv6 {
                    dscp value
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
value	Performs a match based on the specified value. This value is compared with the value in the DSCP field of the ToS byte in the IP header. The DSCP value can be specified as a decimal number (for example, 12), as a hexidecimal number (for example 0x1D), or as a standard name from **/etc/iproute2/rt_dsfield** (for example, **lowdelay**).

Default

If not set, packets are not matched against DSCP value.

Usage Guidelines

Use this command to define a match condition based on the Differentiated Services Code Point (DSCP) field.

The DSCP field is a 6-bit field in the Type of Service (ToS) byte of the IP header. It provides a way of marking packets in order to allow classification of traffic into service classes, and traffic conditioning such as metering, policing, and shaping.

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to set a match condition based on DSCP value.

Use the **delete** form of this command to remove DSCP as a match condition.

Use the **show** form of this command to display DSCP value configuration.

traffic-policy shaper <policy-name> class <class> match <match-name> ipv6 protocol <proto>

Specifies a match criterion based on the IPv6 protocol.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ipv6 protocol** *proto*

delete traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ipv6 protocol**

show traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ipv6 protocol**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            match match-name {
                ipv6 {
                    protocol proto
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
proto	Performs a match based on the protocol name (for example, **icmp**) or number, as assigned by the IANA.

Default

If not set, packets are not matched against IP protocol.

Usage Guidelines

Use this command to define a match condition for a traffic class based on protocol.

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to set a match condition based on protocol.

Use the **delete** form of this command to remove protocol value as a match condition.

Use the **show** form of this command to match condition protocol configuration.

traffic-policy shaper <policy-name> class <class> match <match-name> ipv6 source

Specifies a match criterion based on source IPv6 information.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ipv6 source** {**address** *ipv6net* | **port** *port*}

delete traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ipv6 source** {**address** | **port**}

show traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **ipv6 source**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            match match-name {
                ipv6 {
                    source {
                        address ipv6net
                        port port
                    }
                }
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
ipv6net	The source IPv6 subnet address to match for this rule.

port	The source port to match for this rule. The port may be specified as a lower-case name (for example **ssh**) or as a number. The range for port numbers is 0 to 65535.

Default

If not set, packets are not matched against IPv6 source information.

Usage Guidelines

Use this command to define a match condition based on source subnet address and/or port for a traffic class.

You can match packets based on a source represented by either or both of IPv6 subnet address and destination port(s).

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to specify a source to be matched.

Use the **delete** form of this command to remove source as a match condition.

Use the **show** form of this command to display source match condition configuration.

traffic-policy shaper <policy-name> class <class> match <match-name> vif <vlan-id>

Specifies a a match criterion based on VLAN ID.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **vif** *vlan-id*

delete traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **vif**

show traffic-policy shaper *policy-name* **class** *class* **match** *match-name* **vif**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            match match-name {
                vif vlan-id
            }
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
match-name	Mandatory. Class matching rule name.
vlan-id	Performs a match based on VLAN ID. The range is 1 to 4096.

Default

If not set, packets are not matched against VLAN ID.

Usage Guidelines

Use this command to define a match condition based on VLAN ID for a traffic class.

NOTE *Interface and vif match rules match on packet meta data. All other match rules match on packet data. Match rules from these two groups cannot be combined.*

Use the **set** form of this command to specify a VLAN ID to be matched.

Use the **delete** form of this command to remove VLAN ID as a match condition.

Use the **show** form of this command to display VLAN ID match condition configuration.

traffic-policy shaper <policy-name> class <class> priority <priority>

Specifies the priority of a traffic class for allocation of extra bandwidth.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **priority** *priority*

delete traffic-policy shaper *policy-name* **class** *class* **priority**

show traffic-policy shaper *policy-name* **class** *class* **priority**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            priority priority
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
priority	The priority with which this traffic class should be allocated extra bandwidth. The range is 0 to 7, where the lower the number the lower the priority. The default is 0.

Default

Traffic classes are assigned a priority of 0.

Usage Guidelines

Use this command to set the priority with which a traffic class is to be awarded extra bandwidth when excess is available.

Use the **set** form of this command to specify priority for a traffic class.

Use the **delete** form of this command to restore the default priority for a traffic class.

Use the **show** form of this command to display traffic class priority configuration.

traffic-policy shaper <policy-name> class <class> queue-limit <limit>

Specifies the maximum queue size for a traffic class.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **queue-limit** *limit*

delete traffic-policy shaper *policy-name* **class** *class* **queue-limit**

show traffic-policy shaper *policy-name* **class** *class* **queue-limit**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            queue-limit limit
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
limit	The maximum queue size in packets.

Default

None.

Usage Guidelines

Use this command to set the maximum queue size (in packets) for a traffic class.

Use the **set** form of this command to specify the queue limit.

Use the **delete** form of this command to remove queue limit.

Use the **show** form of this command to display queue limit configuration.

traffic-policy shaper <policy-name> class <class> queue-type <type>

Specifies the type of queuing to use for a traffic class.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **queue-type** *type*

delete traffic-policy shaper *policy-name* **class** *class* **queue-type**

show traffic-policy shaper *policy-name* **class** *class* **queue-type**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            queue-type type
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
type	The queuing method to use. Supported values are as follows: **fair-queue**: Uses a Stochastic Fair Queue (SFQ) queue. **drop-tail**: Uses a First In First Out (FIFO) queue. **priority**: Sets queue priority based on the Differentiated Services Code Point (DSCP) values in the Type of Service (ToS) byte of the IP header. **random-detect**: Uses a Random Early Detection (RED) queue.

Default

The default is **fair-queue**.

Usage Guidelines

Use this command to set the type of queuing mechanism to use for a traffic class.

Use the **set** form of this command to specify the queue type.

Use the **delete** form of this command to restore the default queue type.

Use the **show** form of this command to display queue type configuration.

traffic-policy shaper <policy-name> class <class> set-dscp <value>

Rewrites the DSCP field in packets in this traffic class to the specified value.

Syntax

set traffic-policy shaper *policy-name* **class** *class* **set-dscp** *value*

delete traffic-policy shaper *policy-name* **class** *class* **set-dscp**

show traffic-policy shaper *policy-name* **class** *class* **set-dscp**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        class class {
            set-dscp value
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
class	Mandatory. The class ID. The range is 2 to 4095.
value	The value to write into the DSCP field of packets in this traffic class. The DSCP value can be specified as a decimal number (for example, 12), as a hexidecimal number (for example 0x1D), or as a standard name from **/etc/iproute2/rt_dsfield** (for example, **lowdelay**). By default, the DSCP field is not rewritten.

Default

If not set, the DSCP byte is not rewritten.

Usage Guidelines

Use this command to direct the system to rewrite the Differentiated Services Code Point (DSCP) field of packets in a traffic class to a specific value.

Rewriting the DSCP field can be a way to specify forwarding behavior of a network for packets to allow classification of traffic into service classes, and traffic conditioning such as metering, policing, and shaping.

The following table shows the standard semantics for DSCP values, as specified by RFC 2474.

Table 3-1 RFC 2474 DSCP Values

Binary Value	Configured Value	Drop Rate	Meaning
101 110	46	N/A	Expedited forwarding (EF)
000 000	0	N/A	Default: Best-effort traffic
001 010	10	Low	Assured forwarding (AF) 11
001 100	12	Medium	Assured forwarding (AF) 12
001 110	14	High	Assured forwarding (AF) 13
010 010	18	Low	Assured forwarding (AF) 21
010 100	20	Medium	Assured forwarding (AF) 22
010 110	22	High	Assured forwarding (AF) 23
011 010	26	Low	Assured forwarding (AF) 31
011 100	28	Medium	Assured forwarding (AF) 32
011 110	30	High	Assured forwarding (AF) 33
100 010	34	Low	Assured forwarding (AF) 41
100 100	36	Medium	Assured forwarding (AF) 42
100 110	38	High	Assured forwarding (AF) 43

Use the **set** form of this command to rewrite DSCP values of packets in a traffic class.

Use the **delete** form of this command to stop DSCP values from being rewritten.

Use the **show** form of this command to display DSCP rewrite configuration.

traffic-policy shaper <policy-name> default

Defines a default traffic shaper QoS policy.

Syntax

set traffic-policy shaper *policy-name* **default**

delete traffic-policy shaper *policy-name* **default**

show traffic-policy shaper *policy-name* **default**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        default {
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.

Default

None.

Usage Guidelines

Use this command to define a default traffic shaping policy. This policy will be applied to all traffic that does not match any other defined class.

Use the **set** form of this command to create the default class configuration node.

Use the **delete** form of this command to remove the default class configuration node.

Use the **show** form of this command to display the default class configuration node.

traffic-policy shaper <policy-name> default bandwidth

Specifies the base guaranteed bandwidth rate for the default traffic class.

Syntax

set traffic-policy shaper *policy-name* **default bandwidth** [*rate* | *rate-pct* | *rate-suffix*]

delete traffic-policy shaper *policy-name* **default bandwidth**

show traffic-policy shaper *policy-name* **default bandwidth**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        default {
            bandwidth [rate | rate-pct | rate-suffix]
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
rate	Bandwidth in kbps.
rate-pct	The bandwidth, specified as a percentage of the interface speed. The format is *num*% (for example, 85%).
rate-suffix	The bandwidth, specified as a number and a scaling suffix (for example, 10mbit). The following suffixes are supported: **kbit**: Kilobits per second. **mbit**: Megabits per second. **gbit**: Gigabits per second. **kbps**: Kilobytes per second. **mbps**: Megabytes per second. **gbps**: Gigabytes per second.

Default

100% bandwidth usage is available.

Usage Guidelines

Use this command to set a base level of guaranteed bandwidth for the default traffic class.

Use the **set** form of this command to set the available bandwidth for the default traffic class.

Use the **delete** form of this command to restore the default available bandwidth for the default traffic class.

Use the **show** form of this command to display bandwidth configuration for the default traffic class.

traffic-policy shaper <policy-name> default burst

Sets the burst size for the default traffic class.

Syntax

set traffic-policy shaper *policy-name* **default burst** [*num* | *num-suffix*]

delete traffic-policy shaper *policy-name* **default burst**

show traffic-policy shaper *policy-name* **default burst**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        default {
            burst [num | num-suffix]
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
num	Burst size in bytes.
num-suffix	The burst size, specified as a number and a scaling suffix (for example, 10mb). The following suffixes are supported: **kb**: Kilobytes. **mb**: Megabytes. **gb**: Gigabytes.

Default

The burst size is 15kb.

Usage Guidelines

Use this command to set the burst size for the default traffic class. This is the maximum amount of traffic that may be sent at a given time.

Use the **set** form of this command to specify the burst size for the default traffic class.

Use the **delete** form of this command to restore the default burst size for the default traffic class.

Use the **show** form of this command to display burst size configuration for the default traffic class.

traffic-policy shaper <policy-name> default ceiling

Sets a bandwidth ceiling for the default traffic class.

Syntax

set traffic-policy shaper *policy-name* **default ceiling** [*rate* | *rate-pct* | *rate-suffix*]

delete traffic-policy shaper *policy-name* **default ceiling**

show traffic-policy shaper *policy-name* **default ceiling**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        default {
            ceiling [rate | rate-pct | rate-suffix]
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
rate	The limit in kbps.
rate-pct	The bandwidth, specified as a percentage of the overall bandwidth rate. The format is *num*% (for example, 85%).
rate-suffix	The bandwidth, specified as a number and a scaling suffix (for example, 10mbit). The following suffixes are supported: **kbit**: Kilobits per second. **mbit**: Megabits per second. **gbit**: Gigabits per second.

Default

The default is the full bandwidth.

Usage Guidelines

Use this command to set the maximum amount of bandwidth the default traffic class may consume when excess bandwidth is available.

Use the **set** form of this command to set the bandwidth ceiling for the default traffic class.

Use the **delete** form of this command to restore the default bandwidth ceiling for the default traffic class.

Use the **show** form of this command to display bandwidth ceiling configuration for the default traffic class.

traffic-policy shaper <policy-name> default priority <priority>

Specifies the priority of the default traffic class for allocation of extra bandwidth.

Syntax

set traffic-policy shaper *policy-name* **default priority** *priority*

delete traffic-policy shaper *policy-name* **default priority**

show traffic-policy shaper *policy-name* **default priority**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        default {
            priority priority
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
priority	The priority with which this traffic class should be allocated extra bandwidth. The range is 0 to 7, where the higher the number the lower the priority. The default is 0.

Default

The default priority is assigned a value of 0.

Usage Guidelines

Use this command to set the priority with which the default traffic class is to be awarded extra bandwidth when excess is available.

Use the **set** form of this command to specify priority for the default traffic class.

Use the **delete** form of this command to restore the default priority for the default traffic class.

Use the **show** form of this command to display priority configuration for the default traffic class.

traffic-policy shaper <policy-name> default queue-limit <limit>

Specifies the maximum queue size for the default traffic class.

Syntax

set traffic-policy shaper *policy-name* **default queue-limit** *limit*

delete traffic-policy shaper *policy-name* **default queue-limit**

show traffic-policy shaper *policy-name* **default queue-limit**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        default {
            queue-limit limit
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
limit	The maximum queue size in packets.

Default

None.

Usage Guidelines

Use this command to set the maximum queue size (in packets) for the default class.

Use the **set** form of this command to specify the queue limit.

Use the **delete** form of this command to remove queue limit.

Use the **show** form of this command to display queue limit configuration.

traffic-policy shaper <policy-name> default queue-type <type>

Specifies the type of queuing to use for the default traffic class.

Syntax

set traffic-policy shaper *policy-name* **default queue-type** *type*

delete traffic-policy shaper *policy-name* **default queue-type**

show traffic-policy shaper *policy-name* **default queue-type**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        default {
            queue-type type
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
type	The queuing method to use. Supported values are as follows: **fair-queue**: Uses a Stochastic Fair Queue (SFQ) queue. **drop-tail**: Uses a First In First Out (FIFO) queue. **priority**: Sets queue priority based on the Differentiated Services Code Point (DSCP) values in the Type of Service (ToS) byte of the IP header. **random-detect**: Uses a Random Early Detection (RED) queue.

Default

The default is **fair-queue**.

Usage Guidelines

Use this command to set the type of queuing mechanism to use for the default traffic class.

Use the **set** form of this command to specify the queue type.

Use the **delete** form of this command to restore the default queue type.

Use the **show** form of this command to display queue type configuration.

traffic-policy shaper <policy-name> default set-dscp <value>

Rewrites the DSCP field in packets in the default traffic class to the specified value.

Syntax

set traffic-policy shaper *policy-name* **default set-dscp** *value*

delete traffic-policy shaper *policy-name* **default set-dscp**

show traffic-policy shaper *policy-name* **default set-dscp**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
        default {
            set-dscp value
        }
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
value	The value to write into the DSCP field of packets in the default traffic class. The DSCP value can be specified as a decimal number (for example, 12), as a hexidecimal number (for example 0x1D), or as a standard name from **/etc/iproute2/rt_dsfield** (for example, **lowdelay**). By default, the DSCP field is not rewritten.

Default

If not set, the DSCP byte is not rewritten.

Usage Guidelines

Use this command to direct the system to rewrite the Differentiated Services Code Point (DSCP) field of packets in the default traffic class to a specific value.

Rewriting the DSCP field can be a way to specify forwarding behavior of a network for packets to allow classification of traffic into service classes, and traffic conditioning such as metering, policing, and shaping.

The following table shows the standard semantics for DSCP values, as specified by RFC 2474.

Table 3-2 RFC 2474 DSCP Values

Binary Value	Configured Value	Drop Rate	Meaning
101 110	46	N/A	Expedited forwarding (EF)
000 000	0	N/A	Default: Best-effort traffic
001 010	10	Low	Assured forwarding (AF) 11
001 100	12	Medium	Assured forwarding (AF) 12
001 110	14	High	Assured forwarding (AF) 13
010 010	18	Low	Assured forwarding (AF) 21
010 100	20	Medium	Assured forwarding (AF) 22
010 110	22	High	Assured forwarding (AF) 23
011 010	26	Low	Assured forwarding (AF) 31
011 100	28	Medium	Assured forwarding (AF) 32
011 110	30	High	Assured forwarding (AF) 33
100 010	34	Low	Assured forwarding (AF) 41
100 100	36	Medium	Assured forwarding (AF) 42
100 110	38	High	Assured forwarding (AF) 43

Use the **set** form of this command to rewrite DSCP values of packets in the default traffic class.

Use the **delete** form of this command to stop DSCP values in the default traffic class from being rewritten.

Use the **show** form of this command to display DSCP rewrite configuration for the default traffic class.

traffic-policy shaper <policy-name> description <desc>

Specifies a description for a traffic shaper QoS policy.

Syntax

set traffic-policy shaper *policy-name* **description** *desc*

delete traffic-policy shaper *policy-name* **description**

show traffic-policy shaper *policy-name* **description**

Command Mode

Configuration mode.

Configuration Statement

```
traffic-policy {
    shaper policy-name {
           description desc
    }
}
```

Parameters

policy-name	Mandatory. The name of the traffic shaping policy.
desc	The description for this traffic shaper policy.

Default

None.

Usage Guidelines

Use this command to record a description for a traffic shaper policy.

Use the **set** form of this command to specify a description for a traffic shaper policy.

Use the **delete** form of this command to remove a description from a traffic shaper policy.

Use the **show** form of this command to display description configuration for a traffic shaper policy.

Glossary of Acronyms

ACL	access control list
ADSL	Asymmetric Digital Subscriber Line
AMI	Amazon Machine Image
API	Application Programming Interface
AS	autonomous system
ARP	Address Resolution Protocol
AWS	Amazon Web Services
BGP	Border Gateway Protocol
BIOS	Basic Input Output System
BPDU	Bridge Protocol Data Unit
CA	certificate authority
CCMP	AES in counter mode with CBC-MAC
CHAP	Challenge Handshake Authentication Protocol
CLI	command-line interface
DDNS	dynamic DNS
DHCP	Dynamic Host Configuration Protocol
DHCPv6	Dynamic Host Configuration Protocol version 6

DLCI	data-link connection identifier
DMI	desktop management interface
DMZ	demilitarized zone
DN	distinguished name
DNS	Domain Name System
DSCP	Differentiated Services Code Point
DSL	Digital Subscriber Line
eBGP	external BGP
EBS	Amazon Elastic Block Storage
EC2	Amazon Elastic Compute Cloud
EGP	Exterior Gateway Protocol
ECMP	equal-cost multipath
ESP	Encapsulating Security Payload
FIB	Forwarding Information Base
FTP	File Transfer Protocol
GRE	Generic Routing Encapsulation
HDLC	High-Level Data Link Control
I/O	Input/Ouput
ICMP	Internet Control Message Protocol
IDS	Intrusion Detection System
IEEE	Institute of Electrical and Electronics Engineers
IGP	Interior Gateway Protocol
IPS	Intrusion Protection System
IKE	Internet Key Exchange
IP	Internet Protocol
IPOA	IP over ATM

IPsec	IP security
IPv4	IP Version 4
IPv6	IP Version 6
ISP	Internet Service Provider
KVM	Kernel-Based Virtual Machine
L2TP	Layer 2 Tunneling Protocol
LACP	Link Aggregation Control Protocol
LAN	local area network
LDAP	Lightweight Directory Access Protocol
LLDP	Link Layer Discovery Protocol
MAC	medium access control
MIB	Management Information Base
MLPPP	multilink PPP
MRRU	maximum received reconstructed unit
MTU	maximum transmission unit
NAT	Network Address Translation
ND	Neighbor Discovery
NIC	network interface card
NTP	Network Time Protocol
OSPF	Open Shortest Path First
OSPFv2	OSPF Version 2
OSPFv3	OSPF Version 3
P2P	peer-to-peer
PAM	Pluggable Authentication Module
PAP	Password Authentication Protocol
PAT	Port Address Translation

PCI	peripheral component interconnect
PKI	Public Key Infrastructure
PPP	Point-to-Point Protocol
PPPoA	PPP over ATM
PPPoE	PPP over Ethernet
PPTP	Point-to-Point Tunneling Protocol
PVC	permanent virtual circuit
QoS	quality of service
RADIUS	Remote Authentication Dial-In User Service
RHEL	Red Hat Enterprise Linux
RIB	Routing Information Base
RIP	Routing Information Protocol
RIPng	RIP next generation
Rx	receive
S3	Amazon Simple Storage Service
SLAAC	Stateless Address Auto-Configuration
SNMP	Simple Network Management Protocol
SMTP	Simple Mail Transfer Protocol
SONET	Synchronous Optical Network
SSH	Secure Shell
SSID	Service Set Identifier
STP	Spanning Tree Protocol
TACACS+	Terminal Access Controller Access Control System Plus
TCP	Transmission Control Protocol
TKIP	Temporal Key Integrity Protocol
ToS	Type of Service

Tx	transmit
UDP	User Datagram Protocol
vif	virtual interface
VLAN	virtual LAN
VPC	Amazon virtual private cloud
VPN	Virtual Private Network
VRRP	Virtual Router Redundancy Protocol
WAN	wide area network
WAP	wireless access point
WPA	Wired Protected Access