

Chapter 29

Summary of CoS Configuration Statements

The following sections explain each of the CoS configuration statements. The statements are organized alphabetically.

class

Syntax

```
class class-name {
  classification-override {
    output-queue queue-number;
  }
  precedence-rewrite {
    output-queue queue-number {
      plp-clear rewrite-bits precedence-bit;
      plp-set rewrite-bits precedence-bit;
    }
  }
}
```

Hierarchy Level [edit class-of-service policy]

Description Define a CoS policy class to invoke in a routing policy. You use policy classes for IPv4 traffic when overriding the input packet classification and when rewriting the packet's IP precedence bits.

Options *class-name*—Name of the class.

The remaining statements are explained separately.

Usage Guidelines See "Override the Input Classification" on page 333 and "Rewrite the IP Precedence Bits" on page 334.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

class-of-service

Syntax	class-of-service { ... }
Hierarchy Level	[edit]
Description	Configure JUNOS CoS features.
Default	If you do not configure any CoS features, all packets are transmitted from output transmission queue 0.
Usage Guidelines	See “CoS Configuration Guidelines” on page 327.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

classification-override

Syntax	classification-override { output-queue <i>queue-number</i> ; }
Hierarchy Level	[edit class-of-service policy class class-name]
Description	For IPv4 packets, override the incoming packet classification, assigning all packets sent to a destination prefix to the same output transmission queue.
Usage Guidelines	See “Override the Input Classification” on page 333.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
See Also	policy-statement in the <i>JUNOS Internet Software Configuration Guide: Routing and Routing Protocols</i>

drop-profile

Syntax	<pre> drop-profile <i>profile-name</i> { stream-profile { fill-level <i>fill-percentage</i> drop-probability <i>probability-percentage</i>; } plp-set-queue-profile { fill-level <i>fill-percentage</i> drop-probability <i>probability-percentage</i>; } plp-clear-queue-profile { fill-level <i>fill-percentage</i> drop-probability <i>probability-percentage</i>; } } </pre>
Hierarchy Level	[edit class-of-service output]
Description	<p>Define drop profiles for RED.</p> <p>For a packet to be dropped, it must match the drop profile specified either in the stream-profile and tcp-queue-profile options or in the stream-profile and queue-profile options. RED periodically examines each queue and the packet at the head of the queue. If the congestion level on the queue corresponds to a nonzero drop probability, RED decides whether to drop the packet at the head of the queue.</p>
Options	<p><i>profile-name</i>—Name of the drop profile.</p> <p>The remaining statements are explained separately.</p>
Usage Guidelines	See “Configure Congestion Avoidance Using RED” on page 337.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
See Also	precedence-map on page 353, receive-bucket on page 240, transmit-queues on page 354, weighted-round-robin on page 356

fill-level

Syntax	fill-level <i>fill-percentage</i> drop-probability <i>probability-percentage</i> ;
Hierarchy Level	[edit class-of-service output drop-profile <i>profile-name</i> plp-clear-queue-profile], [edit class-of-service output drop-profile <i>profile-name</i> plp-set-queue-profile], [edit class-of-service output drop-profile <i>profile-name</i> stream-profile]
Description	When configuring RED, map the fullness of a queue to a drop probability.
Options	<i>fill-percentage</i> —How full the queue is, expressed as a percentage. To specify multiple fill levels include multiple fill-level options. List the fill levels incrementally in increasing order. Range: 0 through 100 percent <i>probability-percentage</i> —Probability that a packet will be dropped, expressed as a percentage. A value of 0 means that a packet will never be dropped, and a value of 100 means that all packets will be dropped. Range: 0 through 100 percent
Usage Guidelines	See “Configure Congestion Avoidance Using RED” on page 337.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

fpc

fpc (precedence map)

Syntax	fpc <i>fpc-number</i> { precedence-map <i>map-name</i> ; }
Hierarchy Level	[edit class-of-service input]
Description	Associate an IP precedence bit mapping with an FPC in the router.
Options	<i>fpc-number</i> —Slot number of the FPC. Range: 0 through 7 The remaining statement is explained separately.
Usage Guidelines	See “Assign Precedence Bits to Output Transmission Queues” on page 329.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
See Also	interfaces on page 347, precedence-map on page 353

fpc (drop profile)

Syntax	fpc <i>fpc-number</i> { drop-profile <i>profile-name</i> ; }
Hierarchy Level	[edit class-of-service output]
Description	Associate a drop profile with an FPC in the router.
Options	<i>fpc-number</i> —Slot number of the FPC. Range: 0 through 7
	The remaining statement is explained separately.
Usage Guidelines	See “Configure Congestion Avoidance Using RED” on page 337.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
See Also	interfaces on page 347, precedence-map on page 353

inet-precedence-map

Syntax	inet-precedence-map;
Hierarchy Level	[edit class-of-service input interfaces <i>interface-name</i>]
Description	Associate a precedence bit mapping with a physical interface.
Usage Guidelines	See “Assign Precedence Bits to Output Transmission Queues” on page 329.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
See Also	fpc on page 344, precedence-map on page 353

input

```

Syntax  input {
            fpc fpc-number {
                precedence-map map-name;
            }
            interfaces {
                interface-name {
                    inet-precedence-map;
                    mpls-cos-map;
                    unit unit-number {
                        output-queue queue-number;
                    }
                }
            }
            precedence-map map-name {
                bits precedence-bit output-queue queue-number;
            }
        }

```

Hierarchy Level [edit class-of-service]

Description For incoming packets, select the queue from which the packets are to be transmitted.

Default If you omit this statement, all packets are transmitted from output transmission queue 0.

Options The remaining statements are explained separately.

Usage Guidelines See “Classify and Map Incoming IPv4 Packets” on page 328 and “Classify and Map Incoming MPLS Packets” on page 332.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

interfaces

Syntax	<pre> interfaces { interface-name { inet-precedence-map; mpls-cos-map; unit unit-number { output-queue queue-number; } } } </pre>
Hierarchy Level	[edit class-of-service input]
Description	Configure interface-specific CoS properties for incoming packets.
Options	<p><i>interface-name</i>—Name of the interface.</p> <p>The remaining statements are explained separately.</p>
Usage Guidelines	See “Assign Precedence Bits to Output Transmission Queues” on page 329 and “Map an Input Interface to an Output Transmission Queue” on page 330.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Syntax	<pre> interfaces { interface-name { transmit-queues { output-queue queue-number buffer-percentage percentage; } weighted-round-robin { output-queue queue-number weight percentage; } } } </pre>
Hierarchy Level	[edit class-of-service output]
Description	Associate weighted round-robin and RED parameters with an interface on the router.
Options	<p><i>interface-name</i>—Name of the interface.</p> <p>The remaining statements are explained separately.</p>
Usage Guidelines	See “Configure Weighted Round-Robin to Schedule Packet Transmission” on page 336 and “Configure Congestion Avoidance Using RED” on page 337.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>

mpls-cos-map

Syntax mpls-cos-map;

Hierarchy Level [edit class-of-service input interfaces *interface-name*]

Description Map MPLS packets to multiple output transmission queues.

Default All MPLS packets are placed into output transmission queue 0.

Usage Guidelines See “Classify and Map Incoming MPLS Packets” on page 332.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

See Also class-of-service in the *JUNOS Internet Software Configuration Guide: Routing and Routing Protocols*

output

```

Syntax  output {
            drop-profile profile-name {
                stream-profile {
                    fill-level fill-percentage drop-probability probability-percentage;
                }
                plp-set-queue-profile {
                    fill-level fill-percentage drop-probability probability-percentage;
                }
                plp-clear-queue-profile {
                    fill-level fill-percentage drop-probability probability-percentage;
                }
            }
            fpc fpc-number {
                drop-profile profile-name;
            }
            interfaces {
                interface-name {
                    transmit-queues {
                        output-queue queue-number bandwidth percentage;
                    }
                    weighted-round-robin {
                        output-queue queue-number weight percentage;
                    }
                    unit unit-number {
                        precedence-rewrite {
                            output-queue queue-number {
                                plp-clear rewrite-bits precedence-bit;
                                plp-set rewrite-bits precedence-bit;
                            }
                        }
                    }
                }
            }
        }

```

Hierarchy Level [edit class-of-service]

Description For outgoing packets, configure weighted round-robin and RED.

Options The remaining statements are explained separately.

Usage Guidelines See “Configure Packet Transmission” on page 332.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

output-queue

Syntax	output-queue <i>queue-number</i> ;
Hierarchy Level	[edit class-of-service input interfaces <i>interface-name</i> unit <i>unit-number</i>]
Description	Specify the output transmission queue to which to map all input from an interface.
Options	<i>queue-number</i> —Output queue number. Range: 0 through 3
Usage Guidelines	See “Map an Input Interface to an Output Transmission Queue” on page 330.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

output-queue (buffer percentage)

Syntax	output-queue <i>queue-number</i> buffer-percentage <i>percentage</i> ;
Hierarchy Level	[edit class-of-service output interfaces <i>interface-name</i> transmit-queues]
Description	Specify the percentage of buffer space allocated to an output transmission queue.
Options	<i>queue-number</i> —Output transmission queue number. Range: 0 through 3 <i>percentage</i> —Percentage of buffer space allocated to the queue. The sum of the buffer space assigned to the four queues must be 100 percent. Range: 0 through 100
Usage Guidelines	See “Configure Congestion Avoidance Using RED” on page 337.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

output-queue (weight percentage)

Syntax	output-queue <i>queue-number</i> weight <i>percentage</i> ;
Hierarchy Level	[edit class-of-service output interfaces <i>interface-name</i> weighted-round-robin]
Description	Specify the percentage of total bandwidth allocated to an output transmission queue.
Options	<i>queue-number</i> —Output transmission queue number. Range: 0 through 3 <i>percentage</i> —Percentage of bandwidth allocated to the queue. The sum of the bandwidth assigned to the four queues must be 100 percent. Range: 0 through 100
Usage Guidelines	See “Configure Weighted Round-Robin to Schedule Packet Transmission” on page 336.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

plp-clear

Syntax	plp-clear rewrite bits <i>precedence-bit</i> ;
Hierarchy Level	[edit class-of-service policy precedence-rewrite output-queue <i>queue-number</i>]
Description	Configure the new IP precedence bits to place in packets whose PLP bit is not set.
Options	<i>precedence-bit</i> —IP precedence bits, specified as three binary digits. Values: 000, 001, 010, 011, 100, 101, 110, 111
Usage Guidelines	See “Rewrite the IP Precedence Bits” on page 334.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
See Also	plp-set on page 351

plp-clear-queue-profile

Syntax	plp-clear-queue-profile { fill-level <i>fill-percentage</i> drop-probability <i>probability-percentage</i> ; }
Hierarchy Level	[edit class-of-service output drop-profile <i>profile-name</i>]
Description	Configure the RED drop profile for packets whose PLP bit is not set.
Options	The remaining statement is explained separately.
Usage Guidelines	See “Configure Congestion Avoidance Using RED” on page 337.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
See Also	plp-set-queue-profile on page 352, stream-profile on page 354

plp-set

Syntax	plp-set rewrite bits <i>precedence-bit</i> ;
Hierarchy Level	[edit class-of-service policy precedence-rewrite output-queue <i>queue-number</i>]
Description	Define the new IP precedence bits to place in packets whose PLP bit is set.
Options	<i>precedence-bit</i> —Precedence bits to place in the packet’s IP header. Specify them as a binary number. Range: 001 through 111 (binary)
Usage Guidelines	See “Rewrite the IP Precedence Bits” on page 334.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
See Also	plp-clear on page 351

plp-set-queue-profile

Syntax `plp-set-queue-profile {
 fill-level fill-percentage drop-probability probability-percentage;
 }`

Hierarchy Level [edit class-of-service output drop-profile *profile-name*]

Description Configure the RED drop profile for packets whose PLP bit is set.

Options The remaining statement is explained separately.

Usage Guidelines See “Configure Congestion Avoidance Using RED” on page 337.

Required Privilege Level interface—To view this statement in the configuration.
 interface-control—To add this statement to the configuration.

See Also plp-clear-queue-profile on page 351, stream-profile on page 354

policy

Syntax `policy {
 class class-name {
 classification-override {
 output-queue queue-number;
 }
 }
 }`

Hierarchy Level [edit class-of-service]

Description Define CoS properties to be applied using routing policy.

Options The remaining statements are explained separately.

Usage Guidelines See “Override the Input Classification” on page 333.

Required Privilege Level interface—To view this statement in the configuration.
 interface-control—To add this statement to the configuration.

See Also policy-statement in the *JUNOS Internet Software Configuration Guide: Routing and Routing Protocols*.

precedence-map

Syntax	precedence-map { bits <i>precedence-bit</i> output-queue <i>queue-number</i> ; }
Hierarchy Level	[edit class-of-service input]
Description	Create output transmission queues and configure which packets are placed into which queue. You map packets to queues based on the value of the packet's IPv4 ToS field. If you change the queue assignments for precedence bits 110 and 111, which are used by network control packets, the routing protocols running on the router no longer function correctly.
Options	<i>precedence-bit</i> —IP precedence bits, specified as three binary digits. Values: 000, 001, 010, 011, 100, 101, 110, 111 <i>queue-number</i> —Output transmission queue number. Range: 0 through 3
Usage Guidelines	See "Assign Precedence Bits to Output Transmission Queues" on page 329.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
See Also	drop-profile on page 343, receive-bucket on page 240, transmit-queues on page 354, weighted-round-robin on page 356

precedence-rewrite

Syntax	precedence-rewrite { output-queue <i>queue-number</i> { plp-clear rewrite-bits <i>precedence-bit</i> ; plp-set rewrite-bits <i>precedence-bit</i> ; } }
Hierarchy Level	[edit class-of-service policy class <i>class-name</i>]
Description	Rewrite a packet's IP precedence bits.
Options	The remaining statements are explained separately.
Usage Guidelines	See "Rewrite the IP Precedence Bits" on page 334.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

stream-profile

Syntax stream-profile {
 fill-level *fill-percentage* drop-probability *probability-percentage*;
 }

Hierarchy Level [edit class-of-service output drop-profile *profile-name*]

Description Configure the drop profile for the entire traffic stream that passes through all queues on the interface.

Options The remaining statement is explained separately.

Usage Guidelines See “Configure Congestion Avoidance Using RED” on page 337.

Required Privilege Level interface—To view this statement in the configuration.
 interface-control—To add this statement to the configuration.

See Also plp-clear-queue-profile on page 351, plp-set-queue-profile on page 352

transmit-queues

Syntax transmit-queues {
 output-queue *queue-number* buffer-percentage *percentage*;
 }

Hierarchy Level [edit class-of-service output interfaces *interface-name*]

Description Configure the memory allocation used by each transmit queue on an interface.

Options The remaining statement is explained separately.

Usage Guidelines See “Configure Congestion Avoidance Using RED” on page 337.

Required Privilege Level interface—To view this statement in the configuration.
 interface-control—To add this statement to the configuration.

See Also weighted-round-robin on page 356

unit

Syntax	unit <i>unit-number</i> { output-queue <i>queue-number</i> ; }
Hierarchy Level	[edit class-of-service input interfaces <i>interface-name</i>]
Description	Configure a logical interface on the physical device. You must configure a logical interface to be able to use the physical device.
Options	<i>unit-number</i> —Number of the logical unit. Range: 0 through 16384 The remaining statements are explained separately.
Usage Guidelines	See “Assign Precedence Bits to Output Transmission Queues” on page 329.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Syntax	unit <i>unit-number</i> { precedence-rewrite { output-queue <i>queue-number</i> { plp-clear rewrite-bits <i>precedence-bit</i> ; plp-set rewrite-bits <i>precedence-bit</i> ; } } }
Hierarchy Level	[edit class-of-service output interfaces <i>interface-name</i>]
Description	Configure precedence bit rewriting on an output interface. You configure precedence bit rewriting on individual logical interfaces
Options	<i>unit-number</i> —Number of the logical unit. Range: 0 through 16384 The remaining statements are explained separately.
Usage Guidelines	See “Rewrite the IP Precedence Bits” on page 334.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

weighted-round-robin

Syntax weighted-round-robin {
 output-queue *queue-number* weight *percentage*;
}

Hierarchy Level [edit class-of-service output interfaces *interface-name*]

Description Configure the percentage of link bandwidth used by each transmit queue on an interface.

Options The remaining statement is explained separately.

Usage Guidelines See “Configure Weighted Round-Robin to Schedule Packet Transmission” on page 336.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

See Also drop-profile on page 343, precedence-map on page 353, transmit-queues on page 354