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 327 and "Rewrite the IP Precedence Bits" on page 328.

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 321.

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 queue-number;
}
```

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 327.

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 4.0 Internet Softw are Configur ation Guide: R outing and Routing Protocols*.

drop-profile

Syntax

```
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;
    }
}
```

Hierarchy Level [edit class-of-service output]

Description Define drop profiles for RED.

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.

Options *drop-profile*—Name of the drop profile.

The remaining statements are explained separately.

Usage Guidelines See “Configure Congestion Avoidance Using RED” on page 330.

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

See Also precedence-map on page 347, receive-bucket on page 235, transmit-queues on page 348, weighted-round-robin on page 350

fill-level

Syntax fill-level *fill-percentage* drop-probability *probability-percentage*;

Hierarchy Level [edit class-of-service output drop-profile *profile-name* plp-clear-queue-profile],
[edit class-of-service output drop-profile *profile-name* plp-set-queue-profile],
[edit class-of-service output drop-profile *profile-name* stream-profile]

Description When configuring RED, map the fullness of a queue to a drop probability.

Options *fill-percentage*—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

probability-percentage—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 330.

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 fpc-number {
    precedence-map map-name;
}
```

Hierarchy Level [edit class-of-service input]

Description Associate an IP precedence bit mapping with an FPC in the router.

Options *fpc-number*—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 323.

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 341, precedence-map on page 347

fpc (drop profile)

Syntax
```
fpc fpc-number {
    drop-profile profile-name;
}
```

Hierarchy Level [edit class-of-service output]

Description Associate a drop profile with an FPC in the router.

Options *fpc-number*—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 330.

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 341, precedence-map on page 347

inet-precedence-map

Syntax inet-precedence-map;

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

Description Associate a precedence bit mapping with a physical interface.

Usage Guidelines See "Assign Precedence Bits to Output Transmission Queues" on page 323.

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 338, precedence-map on page 347

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 322 and “Classify and Map Incoming MPLS Packets” on page 326.

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

interfaces

Syntax

```
interfaces {
    interface-name {
        inet-precedence-map;
        mpls-cos-map;
        unit unit-number {
            output-queue queue-number;
        }
    }
}
```

Hierarchy Level [edit class-of-service input]

Description Configure interface-specific CoS properties for incoming packets.

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

The remaining statements are explained separately.

Usage Guidelines See "Assign Precedence Bits to Output Transmission Queues" on page 323 and "Map an Input Interface to an Output Transmission Queue" on page 324.

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

Syntax

```
interfaces {
    interface-name {
        transmit-queues {
            output-queue queue-number buffer-percentage percentage;
        }
        weighted-round-robin {
            output-queue queue-number weight percentage;
        }
    }
}
```

Hierarchy Level [edit class-of-service output]

Description Associate weighted round-robin and RED parameters with an interface on the router.

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

The remaining statements are explained separately.

Usage Guidelines See "Configure Weighted Round-Robin to Schedule Packet Transmission" on page 329 and "Configure Congestion Avoidance Using RED" on page 330.

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

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 326.

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 manual "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 326.

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 *queue-number*;

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

Description Specify the output transmission queue to which to map all input from an interface.

Options *queue-number*—Output queue number.
Range: 0 through 3

Usage Guidelines See “Map an Input Interface to an Output Transmission Queue” on page 324.

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 *queue-number* buffer-percentage *percentage*;

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

Description Specify the percentage of buffer space allocated to an output transmission queue.

Options *queue-number*—Output transmission queue number.
Range: 0 through 3

percentage—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 330.

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 *queue-number* weight *percentage*;

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

Description Specify the percentage of total bandwidth allocated to an output transmission queue.

Options *queue-number*—Output transmission queue number.
Range: 0 through 3

percentage—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 329.

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 *precedence-bit*;

Hierarchy Level [edit class-of-service policy precedence-rewrite output-queue *queue-number*]

Description Configure the new IP precedence bits to place in packets whose PLP bit is not set.

Options *precedence-bit*—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 328.

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 345

plp-clear-queue-profile

Syntax
```
plp-clear-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 not set.

Options The remaining statement is explained separately.

Usage Guidelines See “Configure Congestion Avoidance Using RED” on page 330.

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 346, stream-profile on page 348

plp-set

Syntax plp-set rewrite bits *precedence-bit*;

Hierarchy Level [edit class-of-service policy precedence-rewrite output-queue *queue-number*]

Description Define the new IP precedence bits to place in packets whose PLP bit is set.

Options *precedence-bit*—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 328.

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 345

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 330.

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 345, stream-profile on page 348

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 327.

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 Softw are Configur ation Guide: R outing and R outing Protocols*.

precedence-map

Syntax
```
precedence-map {
    bits precedence-bit output-queue queue-number;
}
```

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 *precedence-bit*—IP precedence bits, specified as three binary digits.
Values: 000, 001, 010, 011, 100, 101, 110, 111

queue-number—Output transmission queue number.
Range: 0 through 3

Usage Guidelines See "Assign Precedence Bits to Output Transmission Queues" on page 323.

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 337, receive-bucket on page 235, transmit-queues on page 348, weighted-round-robin on page 350

precedence-rewrite

Syntax
```
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 class *class-name*]

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 328.

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 330.

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 345, plp-set-queue-profile on page 346

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 330.

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 350

unit

Syntax
```
unit unit-number {
    output-queue queue-number;
}
```

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

Description Configure a logical interface on the physical device. You must configure a logical interface to be able to use the physical device.

Options *unit-number*—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 323.

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

Syntax
```
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 output interfaces *interface-name*]

Description Configure precedence bit rewriting on an output interface. You configure precedence bit rewriting on individual logical interfaces

Options *unit-number*—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 328.

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 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 337, precedence-map on page 347, transmit-queues on page 348