Congestion Management Commands

This chapter describes the commands used to manage congestion.

police rate

To configure traffic policing and enter policy map police configuration mode, use the **police rate** command in policy map class configuration mode. To remove traffic policing from the configuration, use the **no** form of this command.

police rate {*value* [*units*] | **percent** *percentage*}[**burst** *burst-size* [*burst-units*]] [**peak-rate** {*value* [*units*] | **percent** *percentage*}] [**peak-burst** *peak-burst* [*burst-units*]]

no police rate {*value* [*units*] | **percent** *percentage*}[**burst** *burst-size* [*burst-units*]] [**peak-rate** {*value* [*units*] | **percent** *percentage*}] [**peak-burst** *peak-burst* [*burst-units*]]

Syntax Description

value	Committed information rate (CIR). Range is from 1 to 4294967295.
units	(Optional) Unit of measurement for the CIR.
percent *percentage*	Specifies the police rate as a percentage of the CIR. Range is from 1 to 100. See the Usage Guidelines for information on how to use this keyword.
burst *burst-size*	(Optional) Specifies the burst size in the specified *burst-units*. The default burst value is 10 milliseconds of the CIR. The maximum burst value allowed is 4194304 bytes.
burst-units	(Optional) Unit of measurement for the burst values.
peak-rate *value*	(Optional) Specifies the Peak Information Rate (PIR) in the specified *units*.
peak-burst *peak-burst*	(Optional) Specifies the peak burst size in the specified *burst-units*. The default peak burst value is 10 milliseconds of the PIR. The maximum peak-burst value allowed is 8388608 bytes. Also, the difference of the peak-burst value and burst value cannot be larger than 4194304 bytes.

Command Default   No restrictions on the flow of data are applied to any interface.

Command Modes   Policy map class configuration

Command History

Release	Modification
Release 6.1.42	This command was introduced.

Usage Guidelines   Policer conditional set is unsupported.

Policing can be applied only in the ingress direction.

For **police rate** commands, interpret the **percent** keyword in this way:

- For a one-level policy, the **percent** keyword specifies the CIR as a percentage of the link rate. For example, the command **police rate percent 35** configures the CIR as 35% of the link rate.

Note Configured values take into account the Layer 2 encapsulation applied to traffic. This applies to ingress policing. For Ethernet transmission, the encapsulation is considered to be 14 bytes, whereas for IEEE 802.1Q, the encapsulation is 18 bytes.

Note A police rate minimum of 21 kbps is supported.

Task ID

Task ID	Operations
qos	read, write

In this example, traffic policing is configured with an average rate of 200 pps, and a normal burst size of 50 packets, for all packets in class-map class1, leaving HundredGigE interface 0/1/0/0:

```
RP/0/(config)# policy-map pps-1r2c
RP/0/(config-pmap)# class class1
RP/0/(config-pmap-c)# police rate 200 pps burst 50 packets
RP/0/(config-pmap-c)# exit
RP/0/(config-pmap)# exit

RP/0/(config)# HundredGigE interface 0/1/0/0
RP/0/(config-if) service-policy input policy1
```

priority (QoS)

To assign priority to a traffic class based on the amount of available bandwidth within a traffic policy, use the **priority** command in policy map class configuration mode. To remove a previously specified priority for a class, use the **no** form of this command.

priority [**level** *priority-level*]
no priority

Syntax Description

level *priority-level*	(Optional) Sets multiple levels of priority to a traffic class. Level 1 through 7. Default level is 1. Level 1 traffic has higher priority.

Command Default

No default action.

Command Modes

Policy map class configuration

Command History

Release	Modification
Release 6.1.42	This command was introduced.

Usage Guidelines

The **priority** command configures low-latency queueing (LLQ), providing strict priority queueing (PQ). Strict PQ allows delay-sensitive data such as voice to be dequeued and sent before packets in other queues are dequeued. The **priority** command is supported only in the egress direction. No policer is allowed with a priority class. To limit the priority traffic use the **shape average** command.

The **priority** command sets up classes based on a variety of criteria (not just User Datagram Protocol [UDP] ports) and assigns a priority to them.

The **bandwidth** and **priority** commands cannot be used in the same class, within the same policy map. These commands can be used together in the same policy map.

Task ID

Task ID	Operations
qos	read, write

Examples

This example shows how to configure priority queueing for the policy map named policy1 :

```
RP/0/(config)# policy-map policy1
RP/0/(config-pmap)# class class1
RP/0/(config-pmap-c)# priority level 1
```

show qos interface

To display QoS information for a specific interface, use the **show qos interface** command in the EXEC mode.

show qos interface *interface-name* {**input** | **output**}[**location** *node-id*]

Syntax Description		
interface-name		Interface name. For more information about the syntax for the router, use the question mark (?) online help function.
	Note	Use the **show interfaces** command to see a list of all interfaces currently configured on the router.
input		Attaches the specified policy map to the input interface.
output		Attaches the specified policy map to the output interface.
location *node-id*		(Optional) Displays detailed QoS information for the designated node. The *node-id* argument is entered in the rack/slot/module notation.

Command Default　No default behavior or values

Command Modes　EXEC mode

Command History

Release	Modification
Release 6.1.42	This command was introduced.

Usage Guidelines　The **show qos interface** command displays configuration for all classes in the service policy that is attached to an interface.

Use this command to check the actual values programmed in the hardware from the action keywords in the **police rate** command.

Task ID

Task ID	Operations
qos	read

Examples　This is the sample output shows the QoS information on a **interface hundredGigE 0/6/0/18** that are in the output direction:

```
RP/0/# show qos interface hundredGigE 0/6/0/18 output
Wed Dec  2 22:34:25.476 UTC
```

```
NOTE:- Configured values are displayed within parentheses
Interface HundredGigE0/6/0/18 ifh 0x3000210  -- output policy
NPU Id:                      3
Total number of classes:     3
Interface Bandwidth:         100000000 kbps
VOQ Base:                    11176
VOQ Stats Handle:            0x887a6e18
Accounting Type:             Layer1 (Include Layer 1 encapsulation and above)
--------------------------------------------------------------------------------
Level1 Class (HP7)                     =  qos-1
Egressq Queue ID                       =  11177 (HP7 queue)
Queue Max. BW.                         =  0 kbps (default)
TailDrop Threshold                     =  125304832 bytes / 10 ms (default)
WRED not configured for this class

Level1 Class (HP6)                     =  qos-2
Egressq Queue ID                       =  11178 (HP6 queue)
Queue Max. BW.                         =  0 kbps (default)
TailDrop Threshold                     =  125304832 bytes / 10 ms (default)
WRED not configured for this class

Level1 Class                           =  class-default
Egressq Queue ID                       =  11176 (Default LP queue)
Queue Max. BW.                         =  101803495 kbps (default)
Queue Min. BW.                         =  0 kbps (default)
Inverse Weight / Weight                =  1 / (BWR not configured)
TailDrop Threshold                     =  1253376 bytes / 10 ms (default)
WRED not configured for this class
```

This table describes the significant fields shown in the display.

Table 1: show QoS interface Field Descriptions

Field	Description
Level 1 class	Level 1 class identifier in decimal format.
Policer Bucket ID	Policer bucket identifier.
Policer Stats Handle	Policer statistics handle for this class.
Queue ID	VOQ number of the packet in this class.
Queue Max. BW	Maximum bandwidth of the queue.
Queue Min. BW	Minimum bandwidth of the queue.
Inverse Weight / Weight	Remaining bandwidth weight. **Note** The hardware weight is expressed in inverse value.
TailDrop Threshold	Number of bytes taildropped for this queue and the default/user-configured queue-limit expressed in milliseconds/user-configured unit.

show policy-map targets

To display information about the interfaces on which policy maps are applied, use the **show policy-map targets** command in EXEC mode.

show policy-map targets [{**location** *node-id* | **pmap-name** *name* | **type qos** [{**location** *node-id* | **pmap-name** *name*}]}]

Syntax Description

location *node-id*	(Optional) Displays information about the interfaces on which policy maps are applied for the specified location. The *node-id* argument is entered in the *rack/slot/module* notation.
pmap-name *name*	(Optional) Displays information about the interfaces on which the specified policy map is applied.
type qos	(Optional) Displays information about the interfaces on which QoS policy maps are applied. This is the default type.

Command Default

The default QoS policy type is QoS.

Command Modes

EXEC

Command History

Release	Modification
Release 6.1.42	This command was introduced.

Usage Guidelines

For a short period of time while a QoS policy is being modified, there might not be any policy in effect on the interfaces in which the modified policy is used. For this reason, modify QoS policies that affect the fewest number of interfaces at a time. Use the **show policy-map targets** command to identify the number of interfaces that will be affected during policy map modification.

Task ID

Task ID	Operations
qos	read

Examples

In this example, the TenGigabit Ethernet interface 4/0/10/0 has one policy map attached as a main policy. Outgoing traffic on this interface will be affected if the policy is modified:

```
RP/0/# show policy-map targets

Wed Dec  2 22:35:13.993 UTC
1) Policymap: test-qlimit    Type: qos
    Targets (applied as main policy):
      TenGigE0/4/0/10/0 output
      TenGigE0/6/0/30/1 output
    Total targets: 2

    Targets (applied as child policy):
```

```
              Total targets: 0


2) Policymap: test-priority    Type: qos
     Targets (applied as main policy):
       HundredGigE0/6/0/35 output
       HundredGigE0/6/0/34 output
       HundredGigE0/6/0/33 output
       HundredGigE0/6/0/32 output
       HundredGigE0/6/0/31 output
       HundredGigE0/6/0/29 output
       HundredGigE0/6/0/28 output
       HundredGigE0/6/0/27 output
       HundredGigE0/6/0/25 output
       HundredGigE0/6/0/24 output
       HundredGigE0/6/0/23 output
       HundredGigE0/6/0/22 output
       HundredGigE0/6/0/21 output
       HundredGigE0/6/0/20 output
       HundredGigE0/6/0/19 output
       HundredGigE0/6/0/1 output
       HundredGigE0/6/0/3 output
       HundredGigE0/6/0/4 output
       HundredGigE0/6/0/5 output
       HundredGigE0/6/0/6 output
       HundredGigE0/6/0/7 output
       HundredGigE0/6/0/8 output
       HundredGigE0/6/0/9 output
       HundredGigE0/6/0/10 output
       HundredGigE0/6/0/11 output
       HundredGigE0/6/0/13 output
       HundredGigE0/6/0/14 output
       HundredGigE0/6/0/15 output
       HundredGigE0/6/0/16 output
       HundredGigE0/6/0/17 output
     Total targets: 30

     Targets (applied as child policy):
     Total targets: 0
```