Hierarchical Modular QoS Commands

This chapter provides details of the Hierarchical QoS commands.

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.

Hierarchical QoS allows you to specify QoS behavior at multiple policy levels, which provides a high degree of granularity in traffic management. For detailed HQoS concepts, configuration tasks and examples, see the *Modular QoS Configuration Guide for Cisco ASR 9000 Series Routers*

exceed-color

To configure preclassification of Frame Relay packets that are discard-eligible, use the **exceed-color** command in policy map police configuration mode. To remove an exceed color from the policy-map, use the **no** form of this command.

exceed-color *class-map-name*
no exceed-color *class-map-name*

Syntax Description

class-map-name	Specifies the class-map to associate with the exceed-color.

Command Default

By default, if no preclassification is configured for a packet, the packet is not analyzed by the color-aware policer on the ingress interface, and the packet is given regular policing treatment.

Command Modes

Policy map police configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

Typically, frame relay packets from a previous node are marked by default as fr-de = 0 (meaning *not* discard eligible) or fr-de = 1 (meaning discard eligible). For discard-eligible treatment, you must create a class map for the fr-de=1 case and assign the exceed-color to that class-map.

For more information regarding the traffic policing feature, see the police rate command.

Note The multi-action policer sets cannot be used for IP packets.

Task ID

Task ID	Operations
qos	read, write

Examples

In this example, exceed-color is configured for preclassification of packets that are discard-eligible.

```
RP/0/RSP0/CPU0:routerconfigure
RP/0/RSP0/CPU0:router(config)# class-map match-all match_frde
RP/0/RSP0/CPU0:router(config-cmap)# match fr-de 1
RP/0/RSP0/CPU0:router(config-cmap)# policy-map 2R3C_exceed_example
RP/0/RSP0/CPU0:router(config-pmap)# class class-default
RP/0/RSP0/CPU0:router(config-pmap-c)# police rate 768000 burst 288000 peak-rate 1536000
peak-burst 576000
RP/0/RSP0/CPU0:router(config-pmap-c-police)# exceed-color match_frde
RP/0/RSP0/CPU0:router(config-pmap-c-police)# exceed-action set qos-group 2
RP/0/RSP0/CPU0:router(config-pmap-c-police)# exit
RP/0/RSP0/CPU0:router(config-pmap-c)# exit
```

```
RP/0/RSP0/CPU0:router(config-pmap)# exit
RP/0/RSP0/CPU0:router(config)# interface pos 0/2/0/0
RP/0/RSP0/CPU0:router(config-if)# service-policy input policy2
```

Related Commands

Command	Description
child-conform-aware	Prevents the parent policer from dropping any ingress traffic that conforms to the maximum rate specified in the child policer.
class-map	Defines a traffic class and the associated rules that match packets to the class.
conform-action	Configures the action to take on packets that conform to the rate limit.
conform-color	(Used for SIP 700 cards only.) Configures preclassification of ingress Layer 2 Frame Relay packets that have been previously marked as *not* discard eligible on an upstream node. These previously-marked packets are analyzed and preclassified by the color-aware policer on the ingress interface as part of the 2-rate 3-color (2R3C) traffic policing feature.
exceed-action	Configures the action to take on packets that exceed the rate limit.
match fr-de	Match packets on the basis of the Frame Relay discard eligibility (DE) bit setting.
police rate	Configures traffic policing and enters policy map police configuration mode.
policy-map	Creates or modifies a policy map that can be attached to one or more interfaces to specify a service policy.
show policy-map interface	Displays policy configuration information for all classes configured for all service policies on the specified interface.
violate-action	Configures the action to take on packets that violate the rate limit.

fragment

To refer to a defined service fragment, use the **fragment** command in the policy-map configuration mode. To delete an earlier mention of the service fragment, use the **no** form of the command.

fragment *name*
no fragment *name*

Syntax Description

name	Previously defined service-fragment.

Command Default

None

Command Modes

Policy-map configuration mode

Command History

Release	Modification
Release 4.3.1	This command was introduced.

Usage Guidelines

The number of defined service fragments on a port policy is the same as the number of classes supported in a policy.

Task ID

Task ID	Operation
qos	read, write

This example shows how to refer to a previously-defined service fragment:

```
RP/0/RSP0/CPU0:router (config) # policy-map p1
RP/0/RSP0/CPU0:router (config-pmap) # class c1
RP/0/RSP0/CPU0:router (config-pmap-c) # fragment sf1
```

match dei

To specify a drop eligible indicator (DEI) value as a match criteria in a class map, use the **match dei** command in class map configuration mode. To remove a specified DEI value from the matching criteria for a class map, use the **no** form of this command.

match dei *value*
no match dei

Syntax Description

value	Value of the DEI bit. Can be 0 or 1.

Command Default

There is no default DEI value; it must be specified.

Command Modes

Class map configuration

Command History

Release	Modification
Release 3.7.3	This command was introduced.

Usage Guidelines

The **match dei** command specifies a DEI value that is used as the match criteria against which packets are checked to determine if they belong to the class specified by the class map.

Task ID

Task ID	Operation
qos	read, write

Examples

In this example, 802.1ad DEI is derived from the incoming 802.1q. Packets with a DEI value of 0 are remarked with a DEI value of 1.

```
RP/0/RSP0/CPU0:router(config)# class-map match-any remark-dei
RP/0/RSP0/CPU0:router(config-cmap)# match dei 0
RP/0/RSP0/CPU0:router(config-cmap)# end-class-map
RP/0/RSP0/CPU0:router(config)# policy-map p1
RP/0/RSP0/CPU0:router(config-pmap)# class remark-dei
RP/0/RSP0/CPU0:router(config-pmap-c)# set dei 1
RP/0/RSP0/CPU0:router(config-pmap-c)# end-policy-map

RP/0/RSP0/CPU0:router(config)# interface GigabitEthernet0/4/0/39.1 l2transport
RP/0/RSP0/CPU0:router(config-subif)# encapsulation dot1q 1
RP/0/RSP0/CPU0:router(config-subif)# rewrite ingress tag push dot1ad 5 symmetric
RP/0/RSP0/CPU0:router(config-subif)# service-policy input p1
```

Related Commands

Command	Description
class-map	Defines a traffic class and the associated rules that match packets to the class.

Command	Description
match cos	Identifies specified class of service (CoS) values as a match criteria in a class map.

qos output minimum-bandwidth

To set the minimum guaranteed output bandwidth for a subscriber, use the **qos output minimum-bandwidth** command in dynamic template configuration mode.

qos output minimum-bandwidth *range*

Syntax Description

range	Specifies the minimum bandwidth range (1- 4294967295 kpbs).

Command Default

None

Command Modes

Dynamic template configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

This command is available only in the dynamic template type ppp submode. The value specified in this command is used only if IGMP HQoS correlation is configured. This is to ensure that the resultant bandwidth does not go below the specified value.

Task ID

Task ID	Operation
vrrp	read, write

This is an example of configuring the **qos output minimum-bandwidth** command in dynamic template configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp p1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# qos output minimum-bandwidth 10
```

set dei

To set the drop eligible indicator (DEI) value in a policy map class, use the **set dei** command in policy map class configuration mode. To remove a specified DEI value from a policy map class, use the **no** form of this command.

set dei *value*
no set dei

Syntax Description

value	Value of the DEI bit. Can be 0 or 1.

Command Default

There is no default DEI value; it must be specified.

Command Modes

Policy map class configuration

Command History

Release	Modification
Release 6.6.1	This command was introduced.

Usage Guidelines

The **set dei** command specifies a DEI value in a policy map class. For example, traffic can be policed and the excess traffic can be marked with DEI value of 1, so that it can be preferentially dropped in the egress interface or further downstream, when there is congestion.

Task ID

Task ID	Operation
qos	read, write

Examples

In this example, 802.1ad CoS plus DEI is derived from the incoming 802.1q CoS. Packets with a CoS value of 0 are remarked with a DEI value of 1.

```
RP/0/RSP0/CPU0:router(config)# class-map match-any remark-cos
RP/0/RSP0/CPU0:router(config-cmap)# match cos 0
RP/0/RSP0/CPU0:router(config-cmap)# end-class-map
RP/0/RSP0/CPU0:router(config)# policy-map p1
RP/0/RSP0/CPU0:router(config-pmap)# class remark-cos
RP/0/RSP0/CPU0:router(config-pmap-c)# set dei 1
RP/0/RSP0/CPU0:router(config-pmap-c)# end-policy-map

RP/0/RSP0/CPU0:router(config)# interface GigabitEthernet0/4/0/39.1 l2transport
RP/0/RSP0/CPU0:router(config-subif)# encapsulation dot1q 1
RP/0/RSP0/CPU0:router(config-subif)# rewrite ingress tag push dot1ad 5 symmetric
RP/0/RSP0/CPU0:router(config-subif)# service-policy input p1
```

Related Commands

Command	Description
class (policy-map)	Specifies the name of the class whose policy you want to create or change.

Command	Description
class-map	Defines a traffic class and the associated rules that match packets to the class.
policy-map	Creates or modifies a policy map that can be attached to one or more interfaces to specify a service policy.

service-fragment

To define a service fragment in a class, use the **service-fragment** command in the policy-map configuration mode. To delete the service-fragment, use the **no** form of this command.

service-fragment *name*
no service-fragment *name*

Syntax Description

name	Name for the service fragment.

Command Default

None

Command Modes

Policy-map configuration mode

Command History

Release	Modification
Release 4.3.1	This command was introduced.

Usage Guidelines

Service fragment names must be unique in a port policy. However, same names can be used across policies.

Task ID

Task ID	Operation
qos	read, write

This example shows how to define a service fragment name:

```
RP/0/RSP0/CPU0:router (config) # policy-map p1
RP/0/RSP0/CPU0:router (config-pmap) # class c1
RP/0/RSP0/CPU0:router (config-pmap-c) # service-fragment sf1
```

service-fragment-parent

To apply a service fragment policy to an interface, use the **service-fragment-parent** command in the interface configuration mode. To delete the applied service fragment policy, use the **no** form of this command.

service-fragment-parent
no service-fragment-parent

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or value

Command Modes

Interface configuration

Command History

Release	Modification
Release 4.3.1	This command was introduced.

Usage Guidelines

Do not use this command was non-service fragment policies.

Task ID

Task ID	Operation
qos	read, write

Example

This example shows how to use the **service-fragment-parent** command:

```
RP/0/RSP0/CPU0:router (config-if) # service-policy input s1 service-fragment-parent
```