mls qos global configuration mode through mpls experimental

mls qos (global configuration mode)

To enable the quality of service (QoS) functionality globally, use the **mlsqos**command in global configuration mode. To disable the QoS functionality globally, use the **no** form of this command.

mls qos
no mls qos

Syntax Description

This command has no arguments or keywords.

Command Default

QoS is globally disabled.

Command Modes

Global configuration

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was implemented on the Supervisor Engine 2 and integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

If you enable QoS globally, QoS is enabled on all interfaces with the exception of the interfaces where you disabled QoS. If you disable QoS globally, all traffic is passed in QoS pass-through mode.

In port-queueing mode, Policy Feature Card (PFC) QoS (marking and policing) is disabled, and packet type of service (ToS) and class of service (CoS) are not changed by the PFC. All queueing on rcv and xmt is based on a QoS tag in the incoming packet, which is based on the incoming CoS.

For 802.1Q or Inter-Switch Link (ISL)-encapsulated port links, queueing is based on the packet 802.1Q or ISL CoS.

For the router main interfaces or access ports, queueing is based on the configured per-port CoS (the default CoS is 0).

This command enables or disables ternary content addressable memory (TCAM) QoS on all interfaces that are set in the OFF state.

Examples

This example shows how to enable QoS globally:

```
Router(config)# mls qos
Router(config)#
```

This example shows how to disable QoS globally on the Cisco 7600 series routers:

```
Router(config)# no mls qos
Router(config)#
```

Related Commands

Command	Description
mls qos (interface configuration mode)	Enables the QoS functionality on an interface.
show mls qos	Displays MLS QoS information.

mls qos (interface configuration mode)

To enable the quality of service (QoS) functionality on an interface, use the **mlsqos**command in interface configuration command mode. To disable QoS functionality on an interface, use the **no** form of this command.

mls qos
no mls qos

Syntax Description   This command has no arguments or keywords.

Command Default   Enabled

Command Modes

Interface configuration

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines   This command is deprecated on Cisco 7600 series routers that are configured with a Supervisor Engine 2.

Although the CLI allows you to configure PFC-based QoS on the WAN ports on the OC-12 ATM OSMs and on the WAN ports on the channelized OSMs, PFC-based QoS is not supported on the WAN ports on these OSMs.

If you disable QoS globally, it is also disabled on all interfaces.

This command enables or disables TCAM QoS (classification, marking, and policing) for the interface.

Examples   This example shows how to enable QoS on an interface:

```
Router(config-if)# mls qos
```

Related Commands

Command	Description
mls qos (global configuration mode)	Enables the QoS functionality globally.
show mls qos	Displays MLS QoS information.

mls qos 10g-only

To enable quality of service (QoS) in 10g-only mode, in which only the supervisor engine's 10-Gigabit Ethernet uplink ports are used, use the **mls qos 10g-only** command in global configuration mode. To allow the use of all uplink ports, including the 1-Gigabit Ethernet ports, use the **no** form of this command.

mls qos 10g-only
no mls qos 10g-only

Syntax Description   This command has no arguments or keywords.

Command Default   All ports are active on the supervisor engine.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SXH	This command was introduced on the Supervisor Engine 720 -10GE.
15.1(1)SY	This command was modified. The mode switching requirements were changed.

Usage Guidelines   When you enter the **mls qos 10g-only** command, a supervisor engine with both 1-Gigabit and 10-Gigabit Ethernet uplink ports reallocates the interface queue capacity to improve the performance of its 10-Gigabit Ethernet ports. The reallocation is possible only in 10g-only mode, in which the supervisor engine's 1-Gigabit Ethernet ports are not used. In the normal mode, when all supervisor engine ports are active, the queue structure is 2q4t on receive and 1p3q4t on transmit. In 10g-only mode, the queue structure is 8q4t on receive and 1p7q4t on transmit.

Note   To display detailed information about the queues, use the **show queueing interface** command.

When you switch between normal and 10g-only modes, any existing QoS configuration on the uplink ports is lost, and you must reconfigure QoS. In addition, service will be temporarily lost on the ports during the transition.

You must shut down the 1-Gigabit Ethernet ports before entering the **mls qos 10g-only** command. If you do not shut down the ports, the mode change will not occur.

When you switch from 10g-only mode to normal mode, you must enter the **no shutdown** command on each of the 1-Gigabit Ethernet ports to resume QoS service on those ports.

With CSCty37687, when you switch from 10g-only mode to normal mode, you must remove the trust state and the default class of service (CoS) value on the 1-Gigabit supervisor engine uplink ports.

In 10g-only mode, the 1-Gigabit Ethernet ports are visible, but they remain in an administratively down state.

The **mls qos 10g-only** command affects only active and standby supervisors, but if you have four supervisors, you must apply it to the in-chassis standby supervisors.

Examples

The following example shows how to place the supervisor engine in the 10g-only mode:

```
Router# configure terminal
Router(config)# mls qos 10g-only
```

Related Commands

Command	Description
show mls qos interface	Displays QoS information.
show queueing interface	Displays the queueing statistics of an interface.

mls qos aggregate-policer

To define a named aggregate policer for use in policy maps, use the **mlsqosaggregate-policer**command in global configuration mode. To delete a named aggregate policer, use the **no** form of this command.

mls qos aggregate-policer *name* *rate-bps* [**normal-burst-bytes** [{**maximum-burst-bytes** | **pir peak-rate-bps** | **action-type** **action**}]]
no mls qos aggregate-policer *name*

Syntax Description

name	Name of the aggregate policer. See the "Usage Guidelines" section for naming conventions.
rate-bps	Maximum bits per second. Range is 32000 to 10000000000.
normal-burst-bytes	(Optional) Normal burst bytes. Range is 1000 to 31250000.
maximum-burst-bytes	(Optional) Maximum burst bytes. Range is 1000 to 31250000 (if entered, this value must be set equal to normal-burst-bytes).
pir peak-rate-bps	(Optional) Keyword and argument that set the peak information rate (PIR). Range is 32000 to 10000000000. Default is equal to the normal (**cir**) rate.

action-type action	(Optional) Action type keyword. This command may include multiple *action types* and corresponding *actions* to set several actions simultaneously. Valid values are:
	• **conform-action** -- Keyword that specifies the action to be taken when the rate is not exceeded. Valid actions are:
	• **drop**-- Drops the packet.
	• **set-dscp-transmit***value* -- Sets the DSCP value and sends the packet. Valid entries are: 0 to 63 (differentiated code point value), af11 to af43 (match packets with specified AF DSCP), cs1 to cs7 (match packets with specified CS DSCP), default, or ef (match packets with the EF DSCP).
	• **set-mpls-exp-imposition-transmit***number* --Sets experimental (exp) bits at the tag imposition. Valid range is 0 to 7.
	• **set-prec-transmit**-- Rewrites packet precedence and sends the packet.
	• **transmit**--Transmits the packet. This is the default.
	• **exceed-action** -- Keyword that specifies the action to be taken when QoS values are exceeded. Valid actions are:
	• **drop**-- Drops the packet. This is the default.
	• **policed-dscp-transmit**--Changes the DSCP value according to the policed-dscp map and sends the packet.
	• **transmit**--Transmits the packet.
	• **violate-action** -- Keyword that specifies the action to be taken when QoS values are violated. Valid actions are:
	• **drop**-- Drops the packet.
	• **policed-dscp-transmit**--Changes the DSCP value according to the policed-dscp map and sends the packet.
	• **transmit**--Transmits the packet.

Command Default

The defaults are as follows:

- **conform-action** is **transmit**

- **exceed-action** is **drop**

- **violate-action** is equal to the **exceed-action**

- **pir** *peak-rate-bps* is equal to the normal (**cir**) rate.

Command Modes

Global configuration

Command History

Release	Modification
12.2(14)SX	This command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was integrated into Cisco IOS Release 12.2(17d)SXB.

Release	Modification
12.3	This command was implemented on the Cisco 6500 and Cisco 7600.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

This policer can be shared by different policy map classes and on different interfaces. The Cisco 7600 series routers supports up to 1023 aggregates and 1023 policing rules.

The **mlsqosaggregate-policer** command allows you to configure an aggregate flow and a policing rule for that aggregate. When you enter the rate and burst parameters, the range for the average rate is 32 kbps to 10 Gbps (entered as 32000 and 10000000000) and the range for the burst size is 1 KB (entered as 1000) to 31.25 MB (entered as 31250000). Modifying an existing aggregate rate limit entry causes that entry to be modified in NVRAM and in the Cisco 7600 series routers if that entry is currently being used.

Note Because of hardware granularity, the rate value is limited, so the burst that you configure may not be the value that is used.

Modifying an existing microflow or aggregate rate limit modifies that entry in NVRAM as well as in the Cisco 7600 series routers if it is currently being used.

When you enter the aggregate policer name, follow these naming conventions:

- Maximum of 31 characters and may include a-z, A-Z, 0-9, the dash character (-), the underscore character (_), and the period character (.).

- Must start with an alphabetic character and must be unique across all ACLs of all types.

- Case sensitive.

- Cannot be a number.

- Must not be a keyword; keywords to avoid are **all**, **default-action**, **map**, **help**, and **editbuffer.**

Aggregate policing works independently on each DFC-equipped switching module and independently on the PFC2, which supports any non-DFC-equipped switching modules. Aggregate policing does not combine flow statistics from different DFC-equipped switching modules. You can display aggregate policing statistics for each DFC-equipped switching module, PFC2, and any non-DFC-equipped switching modules that are supported by the PFC2 by entering the **showmlsqosaggregatepolicer** command.

Examples

The following example shows how to configure a QoS aggregate policer to allow a maximum of 100000 bits per second with a normal burst byte size of 10000, to set DSCP to 48 when these rates are not exceeded, and to drop packets when these rates are exceeded:

```
Router(config)# mls qos aggregate-policer micro-one 100000 10000 conform-action
set-dscp-transmit 48 exceed-action drop
```

Related Commands

Command	Description
police (policy map)	Creates a per-interface policer and configures the policy-map class to use it.

Command	Description
set ip dscp (policy-map configuration)	Marks a packet by setting the IP DSCP in the ToS byte.
show mls qos aggregate policer	Displays information about the aggregate policer for MLS QoS.

mls qos bridged

To enable the microflow policing for bridged traffic on Layer 3 LAN interfaces, use the **mlsqosbridged**command in interface configuration mode. To disable microflow policing for bridged traffic, use the **no** form of this command.

mls qos bridged
no mls qos bridged

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Interface configuration

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was implemented on the Supervisor Engine 2 and integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

This command is supported on SVIs only.

On Cisco 7600 series routers that are configured with a Supervisor Engine 2, you must enable the **mlsqosbridged** command on an SVI for the microflow policing of IPv4 multicast packets if the user policy is attached to an SVI.

Examples

This example shows how to enable the microflow policing for bridged traffic on a VLAN interface:

```
Router(config-if)# mls qos bridged
```

Related Commands

Command	Description
show mls qos	Displays MLS QoS information.

mls qos channel-consistency

To enable the quality of service (QoS)-port attribute checks on EtherChannel bundling, use the **mlsqoschannel-consistency** command in interface configuration mode. To disable the QoS-port attribute checks on EtherChannel bundling, use the **no** form of this command.

mls qos channel-consistency
no mls qos channel-consistency

| Syntax Description | This command has no arguments or keywords. |

Syntax Description   This command has no arguments or keywords.

Command Default   Enabled

Command Modes

Interface configuration

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was implemented on the Supervisor Engine 2 and integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines   The **mlsqoschannel-consistency** command is supported on port channels only.

Examples   This example shows how to enable the QoS-port attribute checks on the EtherChannel bundling:

```
Router(config-if)# mls qos channel-consistency
```

This example shows how to disable the QoS-port attribute checks on the EtherChannel bundling:

```
Router(config-if)# no mls qos channel-consistency
```

mls qos cos

To define the default multilayer switching (MLS) class of service (CoS) value of a port or to assign the default CoS value to all incoming packets on the port, use the **mlsqoscos** command in interface configuration mode. To return to the default CoS setting, use the no form of this command.

Cisco 3660, 3845, 6500, 7200, 7400, and 7500 Series Routers
mls qos cos {*cos-value* | **override**}
no mls qos cos {*cos-value* | **override**}

Cisco 7600 Series Routers
mls qos cos *cos-value*
no mls qos cos *cos-value*

Syntax Description

cos-value	Assigns a default CoS value to a port. If the port is CoS trusted and packets are untagged, the default CoS value is used to select one output queue as an index into the CoS-to-DSCP map. The CoS range is 0 to 7. The default is 0.
override	Overrides the CoS of the incoming packets and applies the default CoS value on the port to all incoming packets.

Command Default

The defaults are as follows:

- Default CoS value (*cos-value)* value for a port is **0**
- CoS override is not configured .

Command Modes

Interface configuration

Command History

Release	Modification
12.1(6)EA2	This command was introduced. It replaced the **switchportpriority**command.
12.2(14)SX	Support for this command was introduced on the Cisco 7600 series router.
12.2(15)ZJ	This command was implemented on the following platforms: Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(17d)SXB	This command was implemented on the Cisco 7600 series router and integrated into Cisco IOS Release 12.2(17d)SXB.
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T on the following platforms: Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines **Cisco 3660, 3845, 6500, 7200, 7400, and 7500 Series Routers**

You can assign the default CoS and differentiated services code point (DSCP) value to all packets entering a port if the port has been configured by use of the **override** keyword.

Use the **override** keyword when all incoming packets on certain ports deserve a higher or lower priority than packets the enter from other ports. Even if a port was previously set to trust DSCP or CoS, this command overrides that trust state, and all the CoS values on the incoming packets are changed to the default CoS value that is configured with the **mlsqoscos**command. If an incoming packet is tagged, the CoS value of the packet is modified at the ingress port. It is changed to the default CoS of that port.

Use the **showmlsqosinterface**privileged EXEC command to verify your settings.

Cisco 7600 Series Routers

CoS values are configurable on physical LAN ports only.

On Cisco 7600 series routers that are configured with a Supervisor Engine 2, the following restrictions apply:

- This command is not supported on any WAN interface on the Optical Service Modules (OSMs).

- This command is not supported on 4-port Gigabit Ethernet WAN ports.

Examples

Cisco 3660, 3845, 6500, 7200, 7400, and 7500 Series Routers

The following example shows how to assign 4 as the default port CoS:

```
Router(config)# interface gigabitethernet
0/1
Router(config-if)# mls qos trust cos
Router(config-if)# mls qos cos 4
```

The following example shows how to assign 4 as the default port CoS value for all packets the enter the port:

```
Router(config)# interface gigabitethernet
0/1
Router(config-if)# mls qos cos 4
Router(config-if)# mls qos cos override
```

Cisco 7600 Series Routers

The following example shows how to configure the default QoS CoS value as 6:

```
Router(config)# interface gigabitethernet
0/1
Router(config-if)# mls qos cos 6
```

Related Commands

Command	Description
mls qos map	Defines the CoS-to-DSCP map or the DSCP-to-CoS map.
mls qos trust	Configures the port trust state.
show interface fax/y switchport	Displays switch port interfaces.
show mls qos	Displays MLS QoS information.

Command	Description
show mls qos interface	Displays QoS information.

mls qos cos-mutation

To attach an ingress-class-of-service (CoS) mutation map to the interface, use the **mlsqoscos-mutation**command in interface configuration mode. To remove the ingress-CoS mutation map from the interface, use the **no** form of this command.

mls qos cos-mutation *cos-mutation-table-name*
no mls qos cos-mutation

Syntax Description

cos-mutation-table-name	Name of the ingress-CoS mutation table.

Command Default

No ingress-CoS mutation table is defined.

Command Modes

Interface configuration

Command History

Release	Modification
12.2(17b)SXA	This command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

This command is not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2.

Examples

This example shows how to attach the ingress-CoS mutation map named mutemap2:

```
Router(config-if)# mls qos cos-mutation mutemap2
```

Related Commands

Command	Description
mls qos map cos-mutation	Maps a packet's CoS to a new CoS value.
show mls qos	Displays MLS QoS information.

mls qos dscp-mutation

To attach an egress-differentiated-services-code-point (DSCP) mutation map to the interface, use the **mlsqosdscp-mutation**command in interface configuration mode. To remove the egress-DSCP mutation map from the interface, use the **no** form of this command.

mls qos dscp-mutation *dscp-mutation-table-name*
no mls qos dscp-mutation

Syntax Description

dscp-mutation-table-name	Name of the egress-DSCP mutation table.

Command Default   No table is defined.

Command Modes

Interface configuration

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines   This command is not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2.

Examples   This example shows how to attach the egress-DSCP mutation map named mutemap1:

```
Router(config-if)# mls qos dscp-mutation mutemap1
```

Related Commands

Command	Description
mls qos map dscp-mutation	Defines a named DSCP mutation map.
show mls qos	Displays MLS QoS information.

mls qos exp-mutation

To attach an egress-EXP mutation map to the interface in the interface configuration command mode, use the **mlsqosexp-mutation**command. Use the **no** form of this command to remove the egress-EXP mutation map from the interface.

mls qos exp-mutation *exp-mutation-table-name*
no mls qos exp-mutation

Syntax Description

exp-mutation-table-name	Name of the egress-EXP mutation table.

Command Default   No table is defined.

Command Modes

Interface configuration

Command History

Release	Modification
12.2(17a)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines   This command is supported in PFC3BXL or PFC3B mode only.

This command is not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2.

Examples   This example shows how to attach the egress-exp mutation map named mutemap2:

```
Router(config-if)# mls qos exp-mutation mutemap2
Router(config-if)#
```

Related Commands

Command	Description
mls qos map dscp-mutation	Defines a named DSCP mutation map.
show mls qos mpls	Displays an interface summary for MPLS QoS classes in the policy maps.

mls qos loopback

To remove a router port from the Switched Virtual Interface (SVI) flood for VLANs that are carried through by the loopback cable, use the**mlsqosloopback** command in interface configuration mode. To return to the default settings, use the **no** form of this command.

mls qos loopback
no mls qos loopback

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Interface configuration

Command History

Release	Modification
12.2(17a)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was implemented on the Supervisor Engine 2 and integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

With **mlsqosloopback** applied at the interface, the packets are not forwarded to the destination.

Before you enter the **mlsqosloopback** command, you must specify a MAC address for the Optical Services Modules (OSM) interface. The MAC address must be different from the LAN router MAC address that is used in PFC2 hardware switching.

Examples

This example shows how to prevent packets from being forwarded to the destination:

```
Router(config-if)# mls qos loopback
```

mls qos map

To define the multilayer switching (MLS) class of service (CoS)-to-differentiated services code point (DSCP) map or DSCP-to-CoS map, use the **mlsqosmap** command in global configuration mode. To return to the default map, use the no form of this command.

mls qos map {**cos-dscp** *dscp1...dscp8* | **dscp-cos** *dscp-list* **to** *cos*}
no mls qos map {**cos-dscp** | **dscp-cos**}

Syntax Description

cos-dscp *dscp1...dscp8*	Defines the CoS-to-DSCP map.
	For *dscp1...dscp8*, enter eight DSCP values that correspond to CoS values 0 to 7. Separate consecutive DSCP values from each other with a space.
	The supported DSCP values are 0, 8, 10, 16, 18, 24, 26, 32, 34, 40, 46, 48, and 56.
dscp-cos *dscp-list* **to** *cos*	Defines the DSCP-to-CoS map.
	For *dscp-list*, enter up to 13 DSCP values separated by spaces. Then enter the **to** keyword. The supported DSCP values are 0, 8, 10, 16, 18, 24, 26, 32, 34, 40, 46, 48, and 56.
	For *cos*, enter the CoS value to which the DSCP value or values correspond. Range: 0 to 7.

Command Default

The table below shows the default CoS-to-DSCP map.

Table 1: Default CoS-to-DSCP Map

CoS Value	0	1	2	3	4	5	6	7
DSCP Value	0	8	16	26	32	46	48	56

The table below shows the default DSCP-to-CoS map.

Table 2: Default DSCP-to-CoS Map

DSCP Values	0	8, 10	16, 18	24, 26	32, 34	40, 46	48	56
CoS Value	0	1	2	3	4	5	6	7

Command Modes

Global configuration (config)

Command History

Release	Modification
12.1(6)EA2	This command was introduced.

Release	Modification
12.2(15)ZJ	This command was implemented on the following platforms: Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T on the following platforms: Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

All of the CoS-to-DSCP and DSCP-to-CoS maps are globally defined. You apply all maps to all ports.

If you enter the **mlsqostrustcos**command, the default CoS-to-DSCP map is applied.

If you enter the **mlsqostrustdscp** command, the default DSCP-to-CoS map is applied.

After a default map is applied, you can define the CoS-to-DSCP or DSCP-to-CoS map by entering consecutive **mlsqosmap** commands.

If the **mlsqostrustdscp**command is entered and a packet with an untrusted DSCP value is at an ingress port, the packet CoS value is set to 0.

Use the **showmlsqosmaps**privileged EXEC command to verify your settings.

Examples

The following example shows how to define the DSCP-to-CoS map. DSCP values 16, 18, 24, and 26 are mapped to CoS 1. DSCP values 0, 8, and 10 are mapped to CoS 0.

```
Router# configure terminal
Router(config)# mls qos map dscp-cos 16 18 24 26 to 1
Router(config)# mls qos map dscp-cos 0 8 10 to 0
```

The following example shows how to define the CoS-to-DSCP map. CoS values 0 to 7 are mapped to DSCP values 8, 8, 8, 8, 24, 32, 56, and 56.

```
R
outer# configure terminal
Router(config)# mls qos map cos-dscp 8 8 8 8 24 32 56 56
```

Related Commands

Command	Description
mls qos cos	Defines the default CoS value of a port or assigns the default CoS to all incoming packets on the port.
mls qos trust	Configures the port trust state.
show mls qos maps	Displays QoS mapping information.

mls qos map cos-dscp

To define the ingress Class of Service (CoS)-to-differentiated services code point (DSCP) map for trusted interfaces, use the **mlsqosmapcos-dscp**command in global configuration mode. Use the **no** form of this command to remove a prior entry.

mls qos map cos-dscp *dscp1 ...dscp8*
no mls qos map cos-dscp

Syntax Description

dscp1...dscp8	Defines the CoS-to-DSCP map.
	For *dscp1...dscp8*, enter eight DSCP values that correspond to CoS values 0 to 7. Separate consecutive DSCP values from each other with a space.
	The supported DSCP values are 0, 8, 10, 16, 18, 24, 26, 32, 34, 40, 46, 48, and 56.

Command Default

The default CoS-to-DSCP configuration is listed in the table below.

Table 3: CoS-to-DSCP Default Map

CoS	0	1	2	3	4	5	6	7
DSCP	0	8	16	24	32	40	48	56

Command Modes

Global configuration

Command History

Release	Modification
12.1(6)EA2	This command was introduced.
12.2(15)ZJ	This command was implemented on the following platforms: Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T on the following platforms: Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was implemented on the Supervisor Engine 2 and integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

All of the CoS-to-DSCP and DSCP-to-CoS maps are globally defined. You apply all maps to all ports.

If you enter the **mlsqostrustcos**command, the default CoS-to-DSCP map is applied.

If you enter the **mlsqostrustdscp** command, the default DSCP-to-CoS map is applied.

After a default map is applied, you can define the CoS-to-DSCP or DSCP-to-CoS map by entering consecutive **mlsqosmap** commands.

If the **mlsqostrustdscp**command is entered and a packet with an untrusted DSCP value is at an ingress port, the packet CoS value is set to 0.

Use the **showmlsqosmaps**privileged EXEC command to verify your settings.

Examples

The following example shows how to define the CoS-to-DSCP map. CoS values 0 to 7 are mapped to DSCP values 8, 8, 8, 8, 24, 32, 56, and 56.

```
Router#
 configure terminal
Router(config)# mls qos map cos-dscp 8 8 8 8 24 32 56 56
```

Related Commands

Command	Description
mls qos map dscp-cos	Defines an egress DSCP-to-CoS map.
mls qos map ip-prec-dscp	Defines an ingress-IP precedence-to-DSCP map for trusted interfaces.
mls qos map policed-dscp	Sets the mapping of policed DSCP values to marked-down DSCP values.
show mls qos maps	Displays information about the QoS-map configuration and runtime-version.

mls qos map cos-mutation

To map a class of service (CoS) value to a new CoS value for a packet, use the **mlsqosmapcos-mutation**command in the global configuration mode. To remove the map, use the **no** form of this command

mls qos map cos-mutation *name mutated-cos1 mutated-cos2 mutated-cos3 mutated-cos4 mutated-cos5 mutated-cos6 mutated-cos7 mutated-cos8*
no mls qos map cos-mutation *name*

Syntax Description

name	Name of the CoS map.
mutated-cos1 ... mutated-cos8	Eight CoS out values, separated by spaces; valid values are from 0 to 7. See the "Usage Guidelines" section for additional information.

Command Default

If the CoS-to-CoS mutation map is not configured, the default CoS-to-CoS mutation mapping is listed in the table below.

Table 4: CoS-to-CoS Default Map

CoS-in	0	1	2	3	4	5	6	7
CoS-out	0	1	2	3	4	5	6	7

Command Modes

Global configuration

Command History

Release	Modification
12.2(17b)SXA	This command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

This command is not supported on the Catalyst 6500 series switches and the Cisco 7600 series routers that are configured with a Supervisor Engine 2.

This command is supported on the Catalyst 6500 series switches and the Cisco 7600 series routers that are configured with the following modules only:

- WS-X6704-10GE
- WS-X6724-SFP
- WS-X6748-GE-TX

CoS mutation is not supported on non-802.1Q tunnel ports.

When you enter the **mlsqosmapcos-mutation**command, you are configuring the mutated-CoS values map to sequential ingress-CoS numbers. For example, by entering the **mlsqosmapcos-mutation23456701** command, you configure this map:

CoS-in	0	1	2	3	4	5	6	7
CoS-out	2	3	4	5	6	7	0	1

Separate the eight CoS values by a space.

After you define the map in global configuration mode, you can attach the map to a port.

If QoS is disabled, the port is not in a trust CoS mode, and the port is not in 802.1Q tunneling mode. The changes appear once you put the port into trust CoS mode and the port is configured as an 802.1Q tunnel port.

Release 12.2(17b)SXA and later releases support ingress-CoS mutation on 802.1Q tunnel ports and is on a per-port group basis only.

To avoid ingress-CoS mutation configuration failures, only create EtherChannels where all member ports support ingress-CoS mutation or where no member ports support ingress-CoS mutation. Do not create EtherChannels with mixed support for ingress-CoS mutation.

If you configure ingress-CoS mutation on a port that is a member of an EtherChannel, the ingress-CoS mutation is applied to the port-channel interface.

You can configure ingress-CoS mutation on port-channel interfaces.

Examples

This example shows how to define a CoS-to-CoS map:

```
Router(config)# mls qos map cos-mutation test-map 1 2 3 4 5 6 7 1
```

Related Commands

Command	Description
show mls qos maps	Displays information about the QoS-map configuration and runtime-version.

mls qos map dscp-cos

To define an egress differentiated services code point (DSCP)-to-class of service (CoS) map, use the **mlsqosmapdscp-cos** command in global configuration mode. To remove a prior entry, use the **no** form of this command.

mls qos map dscp-cos *dscp-values* **to** *cos-values*
no mls qos map dscp-cos

Syntax Description

dscp-values **to** *cos-values*	Defines the DSCP-to-CoS map.
	For *dscp-list*, enter up to 13 DSCP values separated by spaces. Then enter the **to** keyword. The supported DSCP values are 0, 8, 10, 16, 18, 24, 26, 32, 34, 40, 46, 48, and 56.
	For *cos*, enter the CoS value to which the DSCP value or values correspond. Range: 0 to 7.

Command Default

The default DSCP-to-CoS map is listed in the table below.

Table 5: DSCP-to-CoS Default Map

DSCP	0-7	8-15	16-23	24-31	32-39	40-47	48-55	56-63
CoS	0	1	2	3	4	5	6	7

Command Modes

Global configuration

Command History

Release	Modification
12.1(6)EA2	This command was introduced.
12.2(15)ZJ	This command was implemented on the following platforms: Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T on the following platforms: Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was implemented on the Supervisor Engine 2 and integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

The DSCP-to-CoS map is used to map the final DSCP classification to a final CoS. This final map determines the output queue and threshold to which the packet is assigned. The CoS map is written into the Inter-Switch Link (ISL) header or 802.1Q tag of the transmitted packet on trunk interfaces and contains a table of 64 DSCP

values and the corresponding CoS values. The Catalyst 6500 series switch and the Cisco 7600 series router have one map.

All of the CoS-to-DSCP and DSCP-to-CoS maps are globally defined. You apply all maps to all ports.

If you enter the **mlsqostrustcos**command, the default CoS-to-DSCP map is applied.

If you enter the **mlsqostrustdscp** command, the default DSCP-to-CoS map is applied.

After a default map is applied, you can define the CoS-to-DSCP or DSCP-to-CoS map by entering consecutive **mlsqosmap** commands.

If the **mlsqostrustdscp**command is entered and a packet with an untrusted DSCP value is at an ingress port, the packet CoS value is set to 0.

Use the **showmlsqosmaps**privileged EXEC command to verify your settings.

Examples

The following example shows how to define the DSCP-to-CoS map. DSCP values 16, 18, 24, and 26 are mapped to CoS 1. DSCP values 0, 8, and 10 are mapped to CoS 0.

```
Router# configure terminal
Router(config)# mls qos map dscp-cos 16 18 24 26 to 1
Router(config)# mls qos map dscp-cos 0 8 10 to 0
```

Related Commands

Command	Description
mls qos map cos-dscp	Defines the ingress CoS-to-DSCP map for trusted interfaces.
show mls qos maps	Displays information about the QoS-map configuration and runtime-version.

mls qos map dscp-exp

To map the final differentiated services code point (DSCP) value to the final experimental (EXP) value, use the **mlsqosmapdscp-exp** command in global configuration mode. To remove a prior entry, use the **no** form of this command.

mls qos map dscp-exp *dscp-values* **to** *exp-values*
no mls qos map dscp-exp

Syntax Description

dscp-values	DSCP values; valid values are from 0 to 63.
to	Defines mapping.
exp-values	EXP values; valid values are from 0 to 7.

Command Default

The default DSCP-to-EXP map is listed in the table below.

Table 6: DSCP-to-EXP Default Map

DSCP	0-7	8-15	16-23	24-31	32-39	40-47	48-55	56-63
EXP	0	1	2	3	4	5	6	7

Command Modes

Global configuration

Command History

Release	Modification
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T on the following platforms: Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(17a)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

This command is supported in PFC3BXL or PFC3B mode only.

The DSCP-to-EXP map is used to map the final DSCP value to a final EXP value. This final map determines the output queue and threshold to which the packet is assigned. The EXP map contains a table of 64 DSCP values and the corresponding EXP values. The Catalyst 6500 series switch and the Cisco 7600 series router have one map.

You can enter up to eight DSCP values separated by a space. You can enter up to eight EXP values separated by a space.

Examples

This example shows how to configure the final DSCP value to a final EXP value:

```
Router(config)# mls qos map dscp-exp 20 25 to 3
```

Related Commands	Command	Description
	show mls qos maps	Displays information about the QoS-map configuration and runtime-version.

mls qos map dscp-mutation

To define a named differentiated services code point (DSCP) mutation map, use the **mlsqosmapdscp-mutation** command in global configuration mode. To return to the default mapping, use the **no** form of this command.

mls qos map dscp-mutation *map-name input-dscp1* [*input-dscp2* [*input-dscp3* [**i** *nput-dscp4* [*input-dscp5* [*input-dscp6* [*input-dscp7* [*input-dscp8*]]]]]]] **to** *output-dscp*
no mls qos map dscp-mutation *map-name*

Syntax Description

map-name	Name of the DSCP mutation map .
input-dscp#	Internal DSCP value; valid values are from 0 to 63. See the "Usage Guidelines" section for additional information.
to	Defines mapping.
output-dscp	Egress DSCP value; valid values are from 0 to 63.

Command Default

output-dscp equals *input-dscp*.

Command Modes

Global configuration

Command History

Release	Modification
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T on the following platforms: Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

This command is not supported on the Catalyst 6500 series switches and the Cisco 7600 series routers that are configured with a Supervisor Engine 2.

When configuring a named DSCP mutation map, note the following:

- You can enter up to eight input DSCP values that map to a mutated DSCP value.

- You can enter multiple commands to map additional DSCP values to a mutated DSCP value.

- You can enter a separate command for each mutated DSCP value.

You can configure 15 egress-DSCP mutation maps to mutate the internal DSCP value before it is written as the egress-DSCP value. You can attach egress-DSCP mutation maps to any interface that Policy Feature Card (PFC) QoS supports.

PFC QoS derives the egress-class-of-service (CoS) value from the internal DSCP value. If you configure egress-DSCP mutation, PFC QoS does not derive the egress-CoS value from the mutated DSCP value.

Examples

This example shows how to map DSCP 30 to mutated DSCP value 8:

```
Router(config)# mls qos map dscp-mutation mutemap1 30 to 8
```

Related Commands	Command	Description
	show mls qos maps	Displays information about the QoS-map configuration and runtime-version.

mls qos map exp-dscp

To define the ingress Experimental (EXP) value to the internal differentiated services code point (DSCP) map, use the **mlsqosmapexp-dscp** command in global configuration mode. To return to the default mapping, use the **no** form of this command.

mls qos map exp-dscp *dscp-values*
no mls qos map exp-dscp

Syntax Description	*dscp-values*	D efines the ingress EXP value to the internal DSCP map . Range: 0 to 63.

Command Default

The default EXP-to-DSCP map is listed in the table below.

Table 7: EXP-to-DSCP Default Map

EXP	0	1	2	3	4	5	6	7
DSCP	0	8	16	24	32	40	48	56

Command Modes

Global configuration

Command History

Release	Modification
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T on the following platforms: Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(17a)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was implemented on the Supervisor Engine 2 and integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

This command is supported in PFC3BXL or PFC3B mode only.

The DSCP in these maps refers to the internal DSCP, not the packet DSCP.

The EXP-to-DSCP map is used to map the received EXP value to the internal DSCP map. This final map determines the output queue and threshold to which the packet is assigned. The EXP map contains a table of 64 DSCP values and the corresponding EXP values. The Catalyst 6500 series switch and the Cisco 7600 series router have one map.

You can enter up to eight DSCP values separated by a space.

Examples

This example shows how to configure the received EXP value to an internal DSCP value:

```
Router(config)# mls qos map exp-dscp 20 25 30 31 32 32 33 34
```

Related Commands

Command	Description
mls qos map exp-mutation	Maps a packet's EXP to a new EXP value.
show mls qos mpls	Displays an interface summary for MPLS QoS classes in the policy maps.

mls qos map exp-mutation

To map the Experimental (EXP) value of a packet to a new EXP value, use the **mlsqosmapexp-mutation** command in global configuration mode. To return to the default mapping, use the **no** form of this command.

mls qos map exp-mutation *map-name mutated-exp1 mutated-exp2 mutated-exp3 mutated-exp4 mutated-exp5 mutated-exp6 mutated-exp7 mutated-exp8*
no mls qos map exp-mutation *map-name*

Syntax Description

map-name	Name of the EXP-mutation map .
mutated-exp#	Eight EXP values, separated by spaces ; valid values are from 0 to 7. See the "Usage Guidelines" section for additional information.

Command Default

If the EXP-to-EXP mutation map is not configured, the default EXP-to-EXP mutation mapping is listed in the table below.

Table 8: EXP-to-EXP Mutation Default Map

EXP-in	0	1	2	3	4	5	6	7
EXP-out	0	1	2	3	4	5	6	7

Command Modes

Global configuration

Command History

Release	Modification
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T on the following platforms: Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(17a)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

This command is not supported on the Catalyst 6500 series switch and the Cisco 7600 series router that are configured with a Supervisor Engine 2.

This command is supported in PFC3BXL or PFC3B mode only.

When you enter the**mlsqosmapexp-mutation**command, you are configuring the mutated EXP values map to the sequential EXP numbers. For example, by entering the **mlsqosmapexp-mutation23456701** command, you configure the map as shown in the table below:

Table 9: Mutated EXP Values Mapped to Sequential EXP Values

EXP-in	0	1	2	3	4	5	6	7
EXP-out	2	3	4	5	6	7	0	1

Separate the eight EXP values by a space.

After you define the map in global configuration mode, you can attach the map to a port.

You can configure 15 ingress-EXP mutation maps to mutate the internal EXP value before it is written as the ingress-EXP value. You can attach ingress-EXP mutation maps to any interface that Policy Feature Card (PFC) quality of service (QoS) supports.

The PFC QoS derives the egress EXP value from the internal differentiated services code point (DSCP) value. If you configure ingress-EXP mutation, PFC QoS does not derive the ingress-EXP value from the mutated EXP value.

Examples

This example shows how to map the EXP value of a packet to a new EXP value**:**

```
Router(config)# mls qos map exp-mutation mutemap1 1 2 3 4 5 6 7 0
```

Related Commands

Command	Description
mls qos map exp-dscp	Defines the ingress EXP value to the internal DSCP map.
show mls qos mpls	Displays an interface summary for MPLS QoS classes in the policy maps.

mls qos map ip-prec-dscp

To define an ingress-IP precedence-to-differentiated-services-code-point (DSCP) map for trusted interfaces, use the **mlsqosmapip-prec-dscp**command in global configuration mode. To remove a prior entry, use the **no** form of this command.

mls qos map ip-prec-dscp *dscp-values*
no mls qos map ip-prec-dscp

Syntax Description	*dscp-values*	DSCP values corresponding to IP precedence value s 0 to 7; valid values are from 0 to 63.

Command Default

The default IP precedence-to-DSCP configuration is listed in the table below.

Table 10: IP Precedence-to-DSCP Default Map

IP-Precedence	0	1	2	3	4	5	6	7
DSCP	0	8	16	24	32	40	48	56

Command Modes

Global configuration

Command History

Release	Modification
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T on the following platforms: Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was implemented on the Supervisor Engine 2 and integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

Use the **mlsqosmapip-prec-dscp** command to map the IP precedence of IP packets arriving on trusted interfaces (or flows) to a DSCP when the trust type is trust-ipprec.

You can enter up to eight DSCP values separated by a space.

This map is a table of eight precedence values (0 through 7) and their corresponding DSCP values. The Catalyst 6500 series switch and the Cisco 7600 series router have one map. The IP precedence values are as follows:

- network 7

- internet 6

- critical 5

- flash-override 4

- flash 3

- immediate 2

- priority 1

- routine 0

Examples

This example shows how to configure the ingress-IP precedence-to-DSCP mapping for trusted interfaces:

```
Router(config)# mls qos map ip-prec-dscp 20 30 1 43 63 12 13 8
```

Related Commands

Command	Description
mls qos map cos-dscp	Defines the ingress CoS-to-DSCP map for trusted interfaces.
mls qos map dscp-cos	Defines an egress DSCP-to-CoS map.
mls qos map policed-dscp	Sets the mapping of policed DSCP values to marked-down DSCP values.
show mls qos maps	Displays information about the QoS-map configuration and runtime-version.

mls qos map policed-dscp

To set the mapping of policed differentiated services code point (DSCP) values to marked-down DSCP values, use the **mlsqosmappoliced-dscp**command in global configuration mode. To remove a prior entry, use the **no** form of this command.

mls qos map policed-dscp *dscp-list* **to** *policed-dscp*
no mls qos map policed-dscp

Catalyst 6500 Series Switches and Cisco 7600 Series Routers
mls qos map policed-dscp {**normal-burst** | **max-burst**} *dscp1* [*dscp2* [*dscp3* [*dscp4* [*dscp5* [*dscp6* [*dscp7* [*dscp8*]]]]]]] **to** *policed-dscp*
no mls qos map policed-dscp

Syntax Description

normal-burst	Configures the markdown map used by the **exceed-actionpoliced-dscp-transmit** keywords.
max-burst	Configures the markdown map used by the **violate-actionpoliced-dscp-transmit** keywords.
dscp1	DSCP value. Range: 0 to 63.
dscp2 through *dscp8*	(Optional) DSCP values. Range: 0 to 63.
to	Defines mapping.
policed-dscp	Policed-to-DSCP values; valid values are from 0 to 63.

Command Default

No marked-down values are configured.

Command Modes

Global configuration

Command History

Release	Modification
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T on the following platforms: Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was implemented on the Supervisor Engine 2 and integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

The DSCP-to-policed-DSCP map determines the marked-down DSCP value that is applied to out-of-profile flows. The Catalyst 6500 series switch and the Cisco 7600 series router have one map.

You can enter up to eight DSCP values separated by a space.

You can enter up to eight policed DSCP values separated by a space.

> **Note**   To avoid out-of-sequence packets, configure the DSCP-to-policed-DSCP map so that marked-down packets remain in the same queue as the in-profile traffic.

Examples   This example shows how to map multiple DSCPs to a single policed-DSCP value:

```
Router(config)# mls qos map policed-dscp 20 25 43 to 4
```

Related Commands

Command	Description
mls qos map cos-dscp	Defines the ingress CoS-to-DSCP map for trusted interfaces.
mls qos map dscp-cos	Defines an egress DSCP-to-CoS map.
mls qos map in-prec-dscp	Defines an ingress-IP precedence-to-DSCP map for trusted interfaces.
show mls qos	Displays MLS QoS information.

mls qos marking ignore port-trust

To mark packets even if the interface is trusted, use the **mlsqosmarkingignoreport-trust**command in global configuration mode. To return to the default settings, use the **no** form of this command.

mls qos marking ignore port-trust
no mls qos marking ignore port-trust

Syntax Description   This command has no arguments or keywords.

Command Default   Port trust is enabled.

Command Modes

Global configuration

Command History

Release	Modification
12.2(18)SXF5	This command was introduced.

Usage Guidelines   Use the **mlsqosmarkingignoreport-trust**command to mark packets even if the interface is trusted.

Examples   This example shows how to mark packets even if the interface is trusted:

```
mls qos marking ignore port-trust
```

This example shows how to re-enable port trust:

```
no mls qos marking ignore port-trust
```

Related Commands

Command	Description
mls qos trust	Sets the trusted state of an interface.

mls qos marking statistics

To disable allocation of the policer-traffic class identification with set actions, use the **mlsqosmarkingstatistics** command in global configuration mode. To return to the default settings, use the **no** form of this command.

mls qos marking statistics
no mls qos marking statistics

Syntax Description   This command has no arguments or keywords.

Command Default   Enabled

Command Modes

Global configuration

Command History

Release	Modification
12.2(17a)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(18)SXE	This command was changed to add the collection of statistics for a policy that sets a trust state.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines   This command is not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2.

Use the **showpolicy-mapinterface** command to display policy-map statistics.

Examples   This example shows how to disable allocation of the policer-traffic class identification with set actions:

```
Router(config)# mls qos marking statistics
```

This example shows how to allow allocation of the policer-traffic class identification with set actions:

```
Router(config)# no mls qos marking statistics
```

Related Commands

Command	Description
show policy-map interface	Displays the statistics and the configurations of the input and output policies that are attached to an interface.

mls qos mpls trust experimental

To set the trusted state of Multiprotocol Label Switching (MPLS) packets only, use the **mlsqosmplstrustexperimental** command in interface configuration mode. To set the trusted state of MPLS packets to untrusted, use the **no** form of this command.

mls qos mpls trust experimental
no mls qos mpls trust experimental

Syntax Description

This command has no arguments or keywords.

Command Default

With the trusted state enabled, the defaults are as follows:

- Untrusted--The packets are marked to 0 or by policy.

- trust-cos.

With the trusted state disabled, the defaults are as follows:

- trust-exp--The port or policy trust state is ignored.

- The packets are marked by policy.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(18)SXF2	This command was introduced on the Supervisor Engine 720.

Usage Guidelines

You can enter the **mlsqosmplstrustexperimental**command to treat MPLS packets as other Layer 2 packets for class of service (CoS) and egress queueing purposes (for example, to apply port or policy trust). All trusted cases (trust CoS/IP/Differentiated Services Code Point (DSCP)) are treated as trust-cos.

Class of Service (CoS) refers to three bits in either an ISL header or an 802.1Q header that are used to indicate the priority of the Ethernet frame as it passes through a switched network. The CoS bits in the 802.1Q header are commonly referred to as the 802.1p bits. To maintain QoS when a packet traverses both Layer 2 and Layer 3 domain, the ToS and CoS values can be mapped to each other.

Examples

This example shows how to set the trusted state of MPLS packets to trust-cos:

```
Router(config-if)# mls qos mpls trust experimental
```

This example shows how to set the trusted state of MPLS packets to untrusted:

```
Router(config-if)# no mls qos mpls trust experimental
```

Related Commands

Command	Description
show mls qos mpls	Displays an interface summary for MPLS QoS classes in the policy maps.

mls qos police redirected

To turn on access control list (ACL)-redirected packet policing, use the **mlsqospoliceredirected**command in global configuration mode. To turn off ACL-redirected packet policing, use the **no** form of this command.

mls qos police redirected
no mls qos police redirected

Syntax Description	This command has no arguments or keywords.
Command Default	Enabled
Command Modes	Global configuration

Command History

Release	Modification
12.2(17b)SXA	Support for this command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

This command is supported on PFC3BXL or PFC3B mode only. With Release 12.2(17b)SXA, enter the **showplatformearl-mode** command to display the PFC3 mode.

This command is not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2.

Use the **nomlsqospoliceredirected** command whenever you require NetFlow Data Export (NDE) accuracy (if you do not require QoS-redirected packets).

Examples

This example shows how to turn on the ACL-redirected packet policing:

```
Router(config)# mls qos police redirected
```

This example shows how to turn off the ACL-redirected packet policing:

```
Router(config)# no mls qos police redirected
```

Related Commands

Command	Description
show platform earl-mode	Displays platform information.

mls qos police serial

To enable serial mode for ingress and egress policers on the PFC3C or PFC3CXL, use the **mlsqospoliceserial** command in global configuration mode. To reset the policing mode to parallel, use the **no** form of the command.

mls qos police serial
no mls qos police serial

Syntax Description	This command has no arguments or keywords.
Command Default	This command is disabled by default.
Command Modes	Global configuration (config)

Command History

Release	Modification
12.2(33)SRB	This command was introduced.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

You can use the **mlsqospoliceserial** command to configure the PFC3C or PFC3CXL ingress and egress policers to operate independently of each other (in *serial mode*). Normally, ingress and egress policers operate in parallel mode, where action by one policer causes a corresponding action in the other. For example, if the egress policer drops a packet, the ingress policer does not count the packet either. In serial mode, however, action by one policer does not cause a corresponding action in the other.

Note   This command does not affect marking using policers.

Examples

The following command example shows how to enable serial policing mode on the PFC3C or PFC3CXL:

```
Router(config)# mls qos police serial
```

mls qos protocol

To define routing-protocol packet policing, use the mls qos protocol command in global configuration mode. To return to the default settings, use the **no** form of this command.

mls qos protocol *protocol-name* {**pass-through** | **police** *rate* [*burst*] | **precedence** *value* [**police** *rate* [*burst*]]}
no mls qos protocol *protocol-name*

Syntax Description

protocol-name	Protocol name. Valid values include the following: • **arp** • **bfd-ctrl** • **bfd-echo** • **bgp** • **eigrp** • **glbp** • **igrp** • **isis** • **ldp** • **nd** • **ospf** • **rip** • **vrrp**
pass-through	Specifies pass-through mode.
police *rate*	Specifies the maximum bits per second (bps) to be policed. Valid values are from 32000 to 4000000000 .
burst	(Optional) Normal burst bytes. Valid values are from 1000 to 31250000.
precedence *value*	Specifies the IP-precedence value of the protocol packets to rewrite. Valid values are fro m 0 to 7.

Command Default

The defaults are as follows:

• *burst* is 1000 bits per second.

• If quality of service (QoS) is enabled, the differentiated services code point (DSCP) value is rewritten to zero.

• If QoS is disabled, the port is in a pass-through mode (no marking or policing is applied).

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(17a)SX	This command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was modified to support the ISIS protocol.
12.2(18)SXE	This command was modified as follows on the Supervisor Engine 720 only: • Support for the marking of global **mlsqosprotocol** QoS policies was added. • Support for this command was introduced on the Supervisor Engine 2 but does not support Address Resolution Protocol (ARP), Integrated Intermediate System-to-Intermediate System (ISIS), or Enhanced Interior Gateway Routing Protocol (EIGRP). • The **nd** keyword was added to support neighbor discovery protocol packets. • The **igrp** keyword was removed.
12.2(18)SXF	The **no** form of this command was modified to remove the arguments and keywords.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SRE1	This command was modified. The **bfd-ctrl**, **bfd-echo**, **glbp**, and **vrrp** keywords were added.

Usage Guidelines

This command does not support ARP, ISIS, or EIGRP on Cisco 7600 series routers that are configured with a Supervisor Engine 2.

If you enter the **precedence***value*keyword and arguments without entering the **police***rateburst*keyword and arguments, only the packets from an untrusted port are marked.

You can make the protocol packets avoid the per-interface policy maps by entering the **police***rate*, **pass-through**, or **precedence***value* keywords and arguments.

The **mlsqosprotocol** command allows you to define the routing-protocol packet policing as follows:

• When you specify the **pass-through** mode, the DSCP value does not change and is not policed.

• When you set the **police***rate*, the DSCP value does not change and is policed.

• When you specify the **precedence***value*, the DSCP value changes for the packets that come from an untrusted port, the class of service (CoS) value that is based on DSCP-to-CoS map changes, and the traffic is not policed.

• When you specify the **precedence***value*and the **police***rate*, the DSCP value changes, the CoS value that is based on DSCP-to-CoS map changes, and the DSCP value is policed. In this case, the DSCP value changes are based on the trust state of the port; the DSCP value is changed only for the packets that come from an untrusted port.

• If you do not enter a **precedence***value*, the DSCP value is based on whether or not you have enabled multilayer switching (MLS) QoS as follows:

    • If you enabled MLS QoS and the port is untrusted, the internal DSCP value is overwritten to zero.
    • If you enabled MLS QoS and the port is trusted, then the incoming DSCP value is maintained.

You can make the protocol packets avoid policing completely if you choose the pass-through mode. If the police mode is chosen, the committed information rate (CIR) specified is the rate that is used to police all the specified protocol's packets, both entering or leaving the Cisco 7600 series router.

To protect the system by ARP broadcast, you can enter the **mlsqosprotocolarppolice***bps* command.

Examples

This example shows how to define the routing-protocol packet policing:

```
Router(config)# mls qos protocol arp police 43000
```

This example shows how to avoid policing completely:

```
Router(config)# mls qos protocol arp pass-through
```

This example shows how to define the IP-precedence value of the protocol packets to rewrite:

```
Router(config)# mls qos protocol bgp precedence 4
```

This example shows how to define the IP-precedence value of the protocol packets to rewrite and police the DSCP value:

```
Router(config)# mls qos protocol bgp precedence 4 police 32000 1200
```

Related Commands

Command	Description
show mls qos protocol	Displays protocol pass-through information.

mls qos queueing-only

To enable port-queueing mode, use the **mlsqosqueueing-only** command in global configuration mode. To disable the port-queueing mode, use the **no** form of this command.

mls qos queueing-only
no mls qos queueing-only

Syntax Description

This command has no arguments or keywords.

Command Default

Quality of service (QoS) is globally disabled.

Command Modes

Global configuration

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was implemented on the Supervisor Engine 2 and integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

In port-queueing mode, Policy Feature Card (PFC) QoS (marking and policing) is disabled, and packet type of service (ToS) and class of service (CoS) are not changed by the PFC. All queueing on rcv and xmt is based on a QoS tag in the incoming packet, which is based on the incoming CoS.

For 802.1Q or Inter-Link Switch (ISL)-encapsulated port links, queueing is based on the packet 802.1Q or ISL CoS.

For router main interfaces or access ports, queueing is based on the configured per-port CoS (the default CoS is 0).

Examples

This example shows how to enable the port-queueing mode globally:

```
Router(config)# mls qos queueing-only
```

This example shows how to disable the port-queueing mode globally:

```
Router(config)# no mls qos queueing-only
```

Related Commands

Command	Description
mls qos (global configuration mode)	Enables the QoS functionality globally.
show mls qos	Displays MLS QoS information.

mls qos queue-mode mode-dscp

To set the queuing mode to Differentiated Services Code Point (DSCP) on an interface, use the **mlsqosqueue-modemode-dscp** command in interface configuration mode. To return to the default settings, use the **no** form of this command.

mls qos queue-mode mode-dscp
no mls qos queue-mode mode-dscp

Syntax Description	This command has no arguments or keywords.
Command Default	The queuing mode of an interfaces is class of service (CoS) mode.
Command Modes	Interface configuration (config-if)

Command History

Release	Modification
12.2(18)SXF5	This command was introduced.

Usage Guidelines

This command is supported on 10-Gigabit Ethernet ports only.

You should configure ports to trust DSCP only if they receive traffic that carries valid Layer 3 DSCP.

In Release 12.2(18)SXF5 and later releases, you can enable DSCP-based ingress queues and thresholds on WS-X6708-10GE ports to provide congestion avoidance.

In releases earlier than Release 12.2(18)SXF5, the ingress port queues and thresholds use only Layer 2 Class of Service (CoS), and Policy Feature Card (PFC) QoS does not implement ingress port congestion avoidance on ports configured to trust DSCP.

For traffic from trust DSCP ports, Policy Feature Card (PFC) QoS uses the received DSCP value as the initial internal DSCP value. PFC QoS does not mark any traffic on ingress ports configured to trust received DSCP.

Examples

This example shows how to set the queuing mode to DSCP on an interface:

```
mls qos queue-mode mode-dscp
```

Related Commands

Command	Description
priority-queue queue-limit	Allocates the available buffer space to a queue.
show mls qos	Displays MLS QoS information.

mls qos rewrite ip dscp

To enable type of service (ToS)-to-differentiated services code point (DSCP) rewrite, use the **mlsqosrewriteipdscp** command in global configuration mode. To disable ToS-to-DSCP rewrite, use the **no** form of this command.

mls qos rewrite ip dscp [**slot** *slot1 slot2 slot3...*]
no mls qos rewrite ip dscp [**slot** *slot1 slot2 slot3...*]

Syntax Description		
slot	*slot*	(Optional) Specifies the slot number. Use the mls qos rewrite ip dscp slot ? command to determine the valid slots for your chassis.

Command Default
ToS-to-DSCP rewrite is enabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(17a)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SRD3	This command was modified. The **slot***slot* keyword/argument pair was added.

Usage Guidelines
This command is not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2.

If you disable ToS-to-DSCP rewrite, and QoS is enabled globally, the following occurs:

- Final ToS-to-DSCP rewrite is disabled, and the DSCP packet is preserved.

- Policing and marking function according to the QoS configuration.

- Marked and marked-down class of service (CoS) is used for queueing.

- In QoS disabled mode, both ToS and CoS are preserved.

The **nomlsqosrewriteipdscp** command is incompatible with Multiprotocol Label Switching (MPLS). The default **mlsqosrewriteipdscp** command must remain enabled in order for the PFC3BXL or PFC3B to assign the correct MPLS Experimental (EXP) value for the labels that it imposes. This restriction does not apply to PFC3C or PFC3CXL forward.

The **mlsqosrewriteipdscpslot** command can be used for disabling ToS-to-DSCP rewrite on supervisors or DFC linecards. Although the command will be accepted for non-DFC linecard slots, it does not come into effect unless a DFC linecard is inserted into that slot.

To disable rewrite on packets that are coming in on non-DFC linecards, disable the rewrite on the supervisor slots. Note that this disables the rewrite on packets that are coming in on all non-DFC linecards on the system.

Examples
The following example shows how to enable ToS-to-DSCP rewrite in slot 4:

```
Router(config)# mls qos rewrite ip dscp slot 4
```

The following example shows how to disable port-queueing mode globally:

```
Router(config)# no mls qos rewrite ip dscp
```

Related Commands

Command	Description
mls qos (global configuration mode)	Enables the QoS functionality globally.
show mls qos	Displays MLS QoS information.

mls qos statistics-export (global configuration)

To enable quality of service (QoS)-statistics data export globally, use the **mlsqosstatistics-export**command in global configuration mode. To disable QoS-statistics data export globally, use the **no** form of this command.

mls qos statistics-export
no mls qos statistics-export

Syntax Description   This command has no arguments or keywords.

Command Default   Disabled

Command Modes

Global configuration

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was implemented on the Supervisor Engine 2 and integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines   You must enable data export globally to set up data export on your Cisco 7600 series routers.

QoS-statistics data export is not supported on OSM interfaces.

For QoS-statistics data export to perform correctly, you should set the export-destination hostname or IP address and the User Datagram Port (UDP) number.

Examples   This example shows how to enable data export globally:

```
Router(config)# mls qos statistics-export
```

This example shows how to disable data export globally:

```
Router(config)# no mls qos statistics-export
```

Related Commands

Command	Description
show mls qos statistics-export info	Displays information about the MLS-statistics data-export status and configuration.

mls qos statistics-export (interface configuration)

To enable per-port quality of service (QoS)-statistics data export, use the **mlsqosstatistics-export**command in interface configuration mode. To disable per-port QoS-statistics data export, use the **no** form of this command.

mls qos statistics-export
no mls qos statistics-export

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Interface configuration

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was implemented on the Supervisor Engine 2 and integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

QoS-statistics data export is not supported on OSM interfaces.

You must enable data export on the port and globally to set up data export on your Cisco 7600 series routers.

For QoS-statistics data export to perform correctly, you should set the export-destination hostname or IP address and the User Datagram Port (UDP) number.

QoS-statistics data is exported using delimiter-separated fields. You can set the delimiter by entering the **mlsqosstatistics-exportdelimiter**command.

Port statistics are exported; port QoS statistics are not exported. For each data export-enabled port, the following information is exported:

- Type (1 denotes the type of port)

- Module/port

- In packets (cumulated hardware-counter values)

- In bytes (cumulated hardware-counter values)

- Out packets (cumulated hardware-counter values)

- Out bytes (cumulated hardware-counter values)

- Time stamp (time in seconds since January 1, 1970 UTC relative)

For example, if you have QoS-statistics data export that is enabled on FastEthernet4/5, the exported records could be (in this example, the delimiter is a | [pipe]) as follows:

```
|1|4/5|123|80|12500|6800|982361894|
```

Examples

This example shows how to enable QoS-statistics data export:

```
Router(config-if)# mls qos statistics-export
```

This example shows how to disable QoS-statistics data export:

```
Router(config-if)# no mls qos statistics-export
```

Related Commands

Command	Description
mls qos statistics-export delimiter	Sets the QoS-statistics data-export field delimiter.
show mls qos statistics-export info	Displays information about the MLS-statistics data-export status and configuration.

mls qos statistics-export aggregate-policer

To enable quality of service (QoS)-statistics data export on the named aggregate policer, use the **mlsqosstatistics-exportaggregate-policer** command in global configuration mode. To disable QoS-statistics data export on the named aggregate policer, use the **no** form of this command.

mls qos statistics-export aggregate-policer *policer-name*
no mls qos statistics-export aggregate-policer *policer-name*

Syntax Description

policer-name	Name of the policer.

Command Default   Disabled for all shared aggregate policers.

Command Modes

Global configuration

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was implemented on the Supervisor Engine 2 and integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines   QoS-statistics data export is not supported on Optical Services Modules (OSM) interfaces.

You must enable data export on the shared aggregate policer and globally to set up data export on your Cisco 7600 series routers.

QoS-statistics data is exported using delimiter-separated fields. You can set the delimiter by entering the **mlsqosstatistics-exportdelimiter** command.

For each data export-enabled shared aggregate or named policer, statistics data per policer per EARL is exported. For each data export-enabled shared aggregate or named policer, the following information is exported:

- Type (3 denotes aggregate policer export type)

- Aggregate name

- Direction (in or out)

- Encoded Address Recognition Logic (EARL) identification

- Accepted packets (accumulated hardware-counter values)

- Exceeded normal-rate packets (accumulated hardware-counter values)

- Exceeded excess-rate packets (accumulated hardware-counter values)

- Time stamp (time in seconds since January 1, 1970 UTC relative)

If a shared aggregate policer is attached to policies in both directions, two records are exported (one in each direction). Each record will contain the same counter values for accepted packets, exceeded normal packet rates, and exceeded excess packet rates.

For example, if you have the following configuration:

- QoS-statistics data export that is enabled on the shared aggregate policer named "aggr_1"

- An EARL in the supervisor engine that is installed in slot 1

- An EARL on the Distributed Forwarding Card (DFC) that is installed in slot 3

the exported records could be (note that in this example, the delimiter is a | [pipe]) as follows:

```
|3|agg_1|in|1|45543|2345|982361894|
|3|agg_1|in|3|45543|2345|982361894|
```

Examples

This example shows how to enable per-shared aggregate or named-policer data export:

```
Router(config)# mls qos statistics-export aggregate-policer aggr1M
```

Related Commands

Command	Description
mls qos statistics-export delimiter	Sets the QoS-statistics data-export field delimiter.
show mls qos statistics-export info	Displays information about the MLS-statistics data-export status and configuration.

mls qos statistics-export class-map

To enable quality of service (QoS)-statistics data export for a class map, use the **mlsqosstatistics-exportclass-map** command in global configuration mode. To disable QoS-statistics data export for a class map, use the **no** form of this command.

mls qos statistics-export class-map *classmap-name*
no mls qos statistics-export class-map *classmap-nam e*

Syntax Description

classmap-name	Name of the class map.

Command Default

Disabled

Command Modes

Global configuration

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was implemented on the Supervisor Engine 2 and integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

QoS-statistics data export is not supported on OSM interfaces.

You must enable data export on the class map and globally to set up data export on your Cisco 7600 series routers.

QoS-statistics data is exported using delimiter-separated fields. You can set the delimiter by entering the **mlsqosstatistics-exportdelimiter**command.

For each data export-enabled class map, statistics data per policer per interface is exported. If the interface is a physical interface, the following information is exported:

- Type (4 denotes class map physical export)

- Class-map name

- Direction (in or out)

- Module/port

- Accepted packets (accumulated hardware-counter values)

- Exceeded normal-rate packets (accumulated hardware-counter values)

- Exceeded excess-rate packets (accumulated hardware-counter values)

- Time stamp (time in seconds since January 1, 1970 UTC relative)

If the interface is a Cisco 7600 series router VLAN, the following information is exported:

- Type (5 denotes class-map VLAN export)

- Class-map name

- Direction (in or out)

- Encoded Address Recognition Logic (EARL) identification (slot number in which the EARL is installed)

- VLAN number

- Accepted packets (cumulated hardware-counter values)

- Exceeded normal-rate packets (cumulated hardware-counter values)

- Exceeded excess-rate packets (cumulated hardware-counter values)

- Time stamp (time in seconds since January 1, 1970 UTC relative)

If the interface is a Cisco 7600 series router port channel, the following information is exported:

- Type (6 denotes class-map port-channel export)

- Class-map name

- Direction (in or out)

- EARL identification (slot number in which the EARL is installed)

- Port-channel number

- Accepted packets (cumulated hardware-counter values)

- Exceeded normal-rate packets (cumulated hardware-counter values)

- Exceeded excess-rate packets (cumulated hardware-counter values)

- Time stamp (time in seconds since January 1, 1970 UTC relative)

For example, if you have the following configuration:

- QoS-statistics data export enabled on the class map named "class_1"

- An EARL in the supervisor engine that is installed in slot 1

- An EARL on the Distributed Forwarding Card (DFC) that is installed in slot 3

- The Cisco 7600 series router is in the policy map named "policy_1"

- policy_1 is attached to the following interfaces in the ingress direction:
    - FastEthernet4/5
    - VLAN 100
    - Port-channel 24

The exported records could be (in this example, the delimiter is a | [pipe]) as follows:

|4|class_1|in|4/5|45543|2345|2345|982361894|

|5|class_1|in|1|100|44000|3554|36678|982361894|

|5|class_1|in|3|100|30234|1575|1575|982361894|

Examples

This example shows how to enable QoS-statistics data export for a class map:

```
Router(config)# mls qos statistics-export class-map class3
```

Related Commands

Command	Description
mls qos statistics-export delimiter	Sets the QoS-statistics data-export field delimiter.
show mls qos statistics-export info	Displays information about the MLS-statistics data-export status and configuration.

mls qos statistics-export delimiter

To set the quality of service (QoS)-statistics data-export field delimiter, use the **mlsqosstatistics-exportdelimiter** command in global configuration mode. To return to the default settings, use the **no** form of this command.

mls qos statistics-export delimiter
no mls qos statistics-export delimiter

Syntax Description
This command has no arguments or keywords.

Command Default
The default delimiter is the pipe character (|).

Command Modes

Global configuration

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was implemented on the Supervisor Engine 2 and integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines
QoS-statistics data export is not supported on Optical Service Module (OSM) interfaces.

You must enable data export globally to set up data export on your Cisco 7600 series routers.

Examples
This example shows how to set the QoS-statistics data-export field delimiter (a comma) and verify the configuration:

```
Router(config)# mls qos statistics-export delimiter ,
```

Related Commands

Command	Description
show mls qos statistics-export info	Displays information about the MLS-statistics data-export status and configuration.

mls qos statistics-export destination

To configure the quality of service (QoS)-statistics data-export destination host and User Datagram Protocol (UDP) port number, use the **mlsqosstatistics-exportdestination** command in global configuration mode. To return to the default settings, use the **no** form of this command.

mls qos statistics-export destination {*host-namehost-ip-address*} {**port** *port-number* | **syslog**} [**facility** *facility-name*] [**severity** *severity-value*]

Syntax Description

host-name	Hostname.
host-ip-address	Host IP address.
port *port-number*	Specifies the UDP port number.
syslog	Specifies the syslog port.
facility *facility-name*	(Optional) Specifies the type of facility to export; see the "Usage Guidelines" section for a list of valid values.
severity *severity-value*	(Optional) Specifies the severity level to export; see the "Usage Guidelines" section for a list of valid values.

Command Default

The default is none unless **syslog** is specified. If **syslog** is specified, the defaults are as follows:

- *port* is 514 .

- *facility* is local6 .

- *severity* is debug .

Command Modes

Global configuration

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was implemented on the Supervisor Engine 2 and integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

QoS-statistics data export is not supported on Optical Service Module (OSM) interfaces.

Valid *facility* values are as follows:

- **authorization** --Security/authorization messages

- **cron** --Clock daemon

- **daemon** --System daemon

- **kernel** --Kernel messages

- **local0** --Local use 0

- **local1** --Local use 1

- **local2** --Local use 2

- **local3** --Local use 3

- **local4** --Local use 4

- **local5** --Local use 5

- **local6** --Local use 6

- **local7** --Local use 7

- **lpr** --Line printer subsystem

- **mail** --Mail system

- **news** --Network news subsystem

- **syslog** --Messages that are generated internally by syslogd

- **user** --User-level messages

- **uucp** --UNIX-to-UNIX Copy Program (UUCP) subsystem

Valid *severity* levels are as follows:

- **alert** --Action must be taken immediately

- **critical** --Critical conditions

- **debug** --Debug-level messages

- **emergency** --System is unusable

- **error** --Error conditions

- **informational** --Informational

- **notice** --Normal but significant conditions

- **warning** --Warning conditions

Examples

This example shows how to specify the destination host address and syslog as the UDP port number:

```
Router(config)# mls qos statistics-export destination 172.20.52.3 syslog
```

Related Commands

Command	Description
show mls qos statistics-export info	Displays information about the MLS-statistics data-export status and configuration.

mls qos statistics-export interval

To specify how often a port and/or aggregate-policer quality of service (QoS)-statistics data is read and exported, use the **mlsqosstatistics-exportinterval** command in global configuration mode. To return to the default settings, use the **no** form of this command.

mls qos statistics-export interval *interval*
no mls qos statistics-export interval

Syntax Description

interval	Export time; valid values are from 30 to 65535 se conds.

Command Default

300 seconds

Command Modes

Global configuration

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was implemented on the Supervisor Engine 2 and integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

QoS-statistics data export is not supported on Optical Services Module (OSM) interfaces.

The *interval* needs to be short enough to avoid counter wraparound with the activity in your configuration.

⚠

Caution   Be careful when decreasing the interval because exporting QoS statistics imposes a noticeable load on the Cisco 7600 series routers.

Examples

This example shows how to set the QoS-statistics data-export interval:

```
Router(config)# mls qos statistics-export interval 250
```

Related Commands

Command	Description
show mls qos statistics-export info	Displays information about the MLS-statistics data-export status and configuration.

mls qos supervisor 10g-only

To configure the Cisco 7600 RSP720-10GE to run QoS only on the 10GE uplink ports, use the **mlsqossupervisor10g-only** command in global configuration mode. Use the no form of the command to reconfigure the RSP to run QoS on all the uplink ports (10GE and 1GE).

mls qos supervisor 10g-only
no mls qos supervisor 10g-only

Syntax Description

This command has no arguments or keywords.

Command Default

This command is disabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SRC	This command was introduced on the Cisco 7600 series routers.

Usage Guidelines

The RSP720-10GE has both 10GE and 1GE uplink ports. You can configure the RSP720-10GE to run QoS features on all uplink ports (mixed mode) or on 10GE ports only. The number of queues available for QoS depends on which mode is used:

• In mixed mode (10GE and 1GE ports), the default, only four queues are available for QoS.

The QoS port architecture for fixed mode for 1GE ports is (Rx/Tx): **2q8t/1p3q8t**.

• In 10GE only mode, eight queues are available for QoS.

The QoS port architecture for 10GE only mode is as follows (Rx/Tx):

•   • **8q8t/1p7q8t** (CoS)
    • **16q8t/1p15q8t** (DSCP)
    • **16q1t/1p15q1t** (VLAN)

When you switch between mixed-mode QoS and 10GE only mode, service is temporarily lost on the RSP720-10GE uplinks. In addition, when you switch between modes, any existing QoS configuration on the uplinks is lost. You must reconfigure QoS.

When you switch from 10GE only to mixed-mode QoS, you must issue the **noshutdown** command on each of the three 1GE ports to resume QoS service on those ports.

In 10GE only mode, the 1GE ports are visible but they remain in an administratively down state.

Note

To obtain more information on queues, use the **showqueueinginterface** command.

Examples

The following example shows how to configure the RSP720-10GE to run QoS on 10GE ports only:

```
Router(config)# mls qos supervisor 10g-only
The following ports will be shut to enable 10g-only mode:
Gix/1 Gix/2 Gix/3
```

The following example shows how in a redundant setup (High Availability), the 1GE uplink ports
on both supervisors are shut down even though the redundant links are not used:

```
Router(config)# mls qos supervisor 10g-only
The following ports will be shut to enable 10g-only mode:
Gi6/1 Gi6/2 Gi6/3 Gi5/1 Gi5/2 Gi5/3
```

Related Commands

Command	Description
mls qos (interface configuration)	Displays information about the traffic on an interface.

mls qos trust

To configure the quality of service (QoS) port trust state and to classify traffic by examining the class of service (CoS) or differentiated services code point (DSCP) value, use the **mlsqostrust** command in interface configuration mode. To return a port to its untrusted state, use the **no** form of this command.

mls qos trust [{**cos** | **device cisco-phone** | **dscp** | **ip-precedence**}]
no mls qos trust

Syntax Description

cos	(Optional) Classifies incoming packets that have packet CoS values. The CoS bits in incoming frames are trusted. The internal DSCP value is derived from the CoS bits. The port default CoS value should be used for untagged packets.
device cisco-phone	(Optional) Configures Cisco Discovery Protocol (CDP) to detect whether or not a Cisco IP phone is attached to the port. • If CDP detects a Cisco IP phone, QoS applies a configured **mlsqostrustdscp**, **mlsqostrustip-precedence**, or **mlsqostrustcos** interface command. • If CDP does not detect a Cisco IP phone, QoS ignores any configured nondefault trust state.
dscp	(Optional) Classifies incoming packets that have packet DSCP values (the most significant 6 bits of the 8-bit service-type field). The ToS bits in the incoming packets contain the DSCP value. For non-IP packets, the packet CoS value is 0. If you do not enter a keyword, **mlsqostrustdscp** is assumed.
ip-precedence	(Optional) Specifies that the ToS bits in the incoming packets contain an IP precedence value. The internal DSCP value is derived from the IP-precedence bits.

Command Default

The defaults are as follows:

• If you enable global QoS, the port is not trusted.

• If no keyword is specified or the global QoS is disabled, the default is **dscp**.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.1(6)EA2	This command was introduced.
12.2(14)SX	This command was modified. Support for this command was introduced on the Catalyst 6500 series switches and the Cisco 7600 series routers.
12.2(15)ZJ	This command was implemented on the following platforms: Cisco 2600 series routers, Cisco 3600 series routers, and Cisco 3700 series routers.
12.2(17d)SXB	This command was implemented on the Cisco 7600 series routers and integrated into Cisco IOS Release 12.2(17d)SXB.

Release	Modification
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T on the following platforms: Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(33)SXI	This command was modified. The **devicecisco-phone** keywords were added.

Usage Guidelines

Packets that enter a QoS domain are classified at its edge. Because the packets are classified at the edge, the switch port within the QoS domain can be configured to a trusted state. It is not necessary to classify the packets at every switch within the domain. Use the **mlsqostrust** command to set the trusted state of an interface and to indicate which fields of the packet are used to classify traffic.

When a port is configured with trust DSCP or trust IP precedence and the incoming packet is a non-IP packet, the CoS-to-DSCP map is used to derive the corresponding DSCP value from the CoS value. The CoS can be the packet CoS for trunk ports or the port default CoS for nontrunk ports.

If the DSCP is trusted, the DSCP field of the IP packet is not modified. However, it is still possible that the CoS value of the packet is modified (according to DSCP-to-CoS map).

If the CoS is trusted, the CoS field of the packet is not modified, but the DSCP can be modified (according to CoS-to-DSCP map) if the packet is an IP packet.

The trusted boundary with Cisco device verification feature, implemented with the **devicecisco-phone** keywords, prevents security problems if users connect a non-phone device to a switch port that is configured to support a Cisco IP phone. You must globally enable CDP on the switch and on the port connected to the IP phone. If a Cisco IP phone is not detected, QoS does not apply any configured nondefault trust setting, which prevents misuse of a high-priority queue.

If you configure the trust setting for DSCP or IP precedence, the DSCP or IP precedence values in the incoming packets are trusted. If you configure the **mlsqoscosoverride** interface configuration command on the switch port connected to the IP phone, the switch overrides the CoS of the incoming voice and data packets and assigns the default CoS value to them.

For an inter-QoS domain boundary, you can configure the port to the DSCP-trusted state and apply the DSCP-to-DSCP-mutation map if the DSCP values are different between the QoS domains.

Classification using a port trust state (for example, mls qos trust [**cos** | **dscp** | **ip-precedence**] and a policy map (for example, **service-policyinput**_policy-map-name_) are mutually exclusive. The last one configured overwrites the previous configuration.

The following conditions apply to the **mlsqostrust** command running on the Catalyst 6500 series switches or the Cisco 7600 series routers:

- **The cos** keyword is not supported for **pos** or **atm** interface types.

- The trust state does not apply to FlexWAN modules.

- The trust state does not apply to 1q4t LAN ports except for Gigabit Ethernet ports.

- Incoming queue drop thresholds are not implemented when you enter the **mlsqostrustcos** command on 4-port Gigabit Ethernet WAN modules.

Note Use the **setqos-group** command to set the trust state on Catalyst 6500 series switch and Cisco 7600 series router Layer 2 WAN interfaces.

Examples The following example shows how to set the trusted state of an interface to IP precedence:

```
Router(config-if)# mls qos trust ip-precedence
```

The following example shows how to configure CDP to detect a Cisco IP phone connected to the port:

```
Router(config-if)# mls qos trust device cisco-phone
```

Related Commands

Command	Description
mls qos cos	Defines the default CoS value of a port or assigns the default CoS to all incoming packets on the port.
mls qos map	Defines the CoS-to-DSCP map or the DSCP-to-CoS map.
show mls qos interface	Displays QoS information.

mls qos trust extend

To configure the trust mode of the phone, use the **mlsqostrustextend** command in interface configuration mode. To return to the default settings, use the **no** form of this command.

mls qos trust extend [**cos** *value*]
no mls qos trust extend

Syntax Description

cos *value*	(Optional) Specifies the class of service (CoS) value that is used to remark the packets from the PC; valid values are from 0 to 7.

Command Default

The default settings are as follows:

- Mode is untrusted.
- **cos** *value* is 0.

Command Modes

Interface configuration

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was implemented on the Supervisor Engine 2 and integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

This command is not supported on WAN modules.

If you set the phone to trusted mode, all the packets from the PC are sent untouched directly through the phone to the Cisco 7600 series router. If you set the phone to untrusted mode, all the traffic coming from the PC are remarked with the configured CoS value before being sent to the Cisco 7600 series router.

Each time that you enter the **mlsqostrustextend** command, the mode is changed. For example, if the mode was previously set to trusted, if you enter the command, the mode changes to untrusted. Enter the **showqueueinginterface** command to display the current trust mode.

Examples

This example shows how to set the phone that is attached to the switch port in trust mode:

```
Router(config-if)# interface fastethernet5/1
Router(config-if)# mls qos trust extend
```

This example shows how to change the mode to untrusted and set the remark CoS value to 3:

```
Router(config-if)# interface fastethernet5/1
Router(config-if)# mls qos trust extend cos 3
```

This example shows how to set the configuration to the default mode:

```
Router(config-if)# interface fastethernet5/1
Router(config-if)# no mls qos trust extend
```

Related Commands

Command	Description
show queueing interface	Displays queueing information.

mls qos tunnel gre input uniform-mode

To enable the original quality of service (QoS) marking of ingress packets to be copied into the differentiated services code point (DSCP) field of the ingress packet and the Generic Routing Encapsulation (GRE) header, use the **mlsqostunnelgreinputuniform-mode** command in interface configuration mode. To disable the copying operation, use the **no** form of this command.

mls qos tunnel gre input uniform-mode
no mls qos tunnel gre input uniform-mode

Syntax Description	This command has no arguments or keywords.
Command Default	No marking operation is performed on the incoming packets or the GRE headers.
Command Modes	Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SXI	This command was introduced.

Usage Guidelines

This command is supported only in PFC3C mode or PFC3CXL mode.

Enter the **showmlsqos** command to verify the configuration.

Examples

The following example shows how to enable the original QoS marking of ingress packets to be copied into the DSCP field and copied in the GRE header:

```
Router(config-if)# mls qos tunnel gre input uniform-mode
```

Related Commands

Command	Description
show mls qos	Displays MLS QoS information.

mls qos vlan-based

To enable per-VLAN quality of service (QoS) for a Layer 2 interface, use the **mlsqosvlan-based**command in interface configuration mode. To disable per-VLAN QoS for a Layer 2 interface, use the **no** form of this command.

mls qos vlan-based
no mls qos vlan-based

Syntax Description	This command has no arguments or keywords.
Command Default	Disabled
Command Modes	Interface configuration

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	This command was implemented on the Supervisor Engine 2 and integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

This command is supported on switch-port and port-channel interfaces only.

In VLAN-based mode, the policy map that is attached to the Layer 2 interface is ignored, and QoS is driven by the policy map that is attached to the corresponding VLAN interface.

You can configure per-VLAN QoS only on Layer 2 interfaces.

Note Layer 3 interfaces are always in interface-based mode. Layer 3 VLAN interfaces are always in VLAN-based mode.

Examples

This example shows how to enable per-VLAN QoS for a Layer 2 interface:

```
Router(config-if)# mls qos vlan-based
```

Related Commands

Command	Description
mls qos bridged	Enables the microflow policing for bridged traffic on Layer 3 LAN interfaces.
mls qos cos	Defines the default CoS value for an interface.
show queueing interface	Displays queueing information.

monitor pids

To configure the program identifiers (PIDs) to be monitored in the Media Delivery Index (MDI) flow, use the **monitorpids** command in the monitor metric mdi mode. To auto-learn the PIDs, use the **no** form of this command.

monitor pids *pid1* [*pid2*] [*pid3*] [*pid4*] [*pid5*]
no monitor pids

Syntax Description		
	pid1 [*pid2*] [*pid3*] [*pid4*] [*pid5*	*PIDs you monitor in the MDI flows. The PID value range is 2 to 8190. (Corresponding hexadecimal format range for PIDs: 0x2 to 0x1FFE)*

Command Default No PIDs are configured.

Command Modes

(config-pmap-c-metric) #

Command History

Release	Modification
15.1(1)S	This command was introduced.

Usage Guidelines Use the**monitorpids**command to configure the PIDs to monitor in a MDI flow. By default, the first five PIDs in a new MDI flow stream are logged for monitoring. These PIDs can be video, audio or caption PIDs. However, monitoring PIDs for audio or caption data is not a priority for a customer implementing inline video monitoring, and is optional.

Examples This example shows how to configure the PIDs:

```
router(config-pmap-c-metric)# monitor pids 4050 4678 8902
```

Related Commands

Command	Description
show policy-map type performance-traffic	Displays policy-map information along with the monitored PIDs, if configured.

mpls experimental

To configure Multiprotocol Label Switching (MPLS) experimental (EXP) levels for a virtual circuit (VC) class that can be assigned to a VC bundle and thus applied to all VC members of that bundle, use the **mplsexperimental**command in VC-class configuration mode. To remove the MPLS EXP levels from the VC class, use the **no** form of this command.

To configure the MPLS EXP levels for a VC member of a bundle, use the **mplsexperimental**command in bundle-vc configuration mode. To remove the MPLS EXP levels from the VC, use the **no** form of this command.

mpls experimental [{**other***range*}]
no mpls experimental

Syntax Description	**other**	(Optional) Specifies any MPLS EXP levels in the range from 0 to 7 that are not explicitly configured. This is the default.
	range	(Optional) A single MPLS EXP level specified as a number from 0 to 7, or a range of levels, specified as a hyphenated range.

Command Default

Defaults to **other**, that is, any MPLS EXP levels in the range from 0 to 7 that are not explicitly configured.

Command Modes

VC-class configuration for a VC class (config-vc-class)
Bundle-vc configuration for ATM VC bundle members (config-if-atm-member)

Command History

Release	Modification
12.2(8)T	This command was introduced.
12.0(26)S	This command was implemented on the Cisco 10000 series router.
12.0(29)S	This command was integrated into Cisco IOS Release 12.0(29)S.
12.2(16)BC	This command was implemented on the ESR-PRE2.
12.2(31)SB	This command was integrated into Cisco IOS Release 12.2(31)SB.

Usage Guidelines

Assignment of MPLS EXP levels to VC bundle members allows you to create differentiated service because you can distribute the MPLS EXP levels over the different VC bundle members. You can map a single level or a range of levels to each discrete VC in the bundle, thereby enabling VCs in the bundle to carry packets marked with different levels. Alternatively, you can configure a VC with the **mplsexperimentalother** command to indicate that it can carry traffic marked with levels not specifically configured for it. Only one VC in the bundle can be configured with the **mplsexperimentalother** command to carry all levels not specified. This VC is considered the default one.

To use this command in VC-class configuration mode, enter the **vc-classatm** global configuration command before you enter this command. This command has no effect if the VC class that contains the command is attached to a standalone VC, that is, if the VC is not a bundle member.

To use this command to configure an individual bundle member in bundle-VC configuration mode, first enter the **bundle** command to enact bundle configuration mode for the bundle to which you want to add or modify the VC member to be configured. Then use the **pvc-bundle** command to specify the VC to be created or modified and enter bundle-VC configuration mode.

VCs in a VC bundle are subject to the following configuration inheritance guidelines (listed in order of next highest MPLS EXP level):

- VC configuration in bundle-VC mode

- Bundle configuration in bundle mode (with the effect of assigned VC class configuration)

- Subinterface configuration in subinterface mode

Note If you are using an ATM interface, you must configure all MPLS EXP levels (ranging from 0 to 7) for the bundle. For this configuration, Cisco recommends configuring one member of the bundle with the **mplsexperimentalother** command. The **other** keyword defaults to any MPLS EXP level in a range from 0 to 7 that is not explicitly configured.

Examples

The following example configures a class named control-class that includes an **mplsexperimental**command that, when applied to a bundle, configures all VC members of that bundle to carry MPLS EXP level 7 traffic. Note that VC members of that bundle can be individually configured with the **mplsexperimental**command at the bundle-vc level, which would supervene.

```
vc-class atm control-class
 mpls experimental 7
```

The following example configures a permanent virtual circuit (PVC) 401, named control-class, to carry traffic with MPLS EXP levels in the range of 4 to 2, overriding the level mapping set for the VC through VC-class configuration:

```
pvc-bundle control-class 401
 mpls experimental 4-2
```

Related Commands

Command	Description
bump	Configures the bumping rules for a VC class that can be assigned to a VC bundle.
bundle	Creates a bundle or modifies an existing bundle, and enters bundle configuration mode.
class-vc	Assigns a VC class to an ATM PVC, SVC, or VC bundle member.
protect	Configures a VC class with protected group or protected VC status for application to a VC bundle member.
pvc-bundle	Adds a VC to a bundle as a member and enters bundle-VC configuration mode to configure that VC bundle member.
ubr	Configures UBR QoS and specifies the output peak cell rate for an ATM PVC, SVC, VC class, or VC bundle member.

Command	Description
vbr-nrt	Configures the VBR-nrt QoS and specifies the output peak cell rate, output sustainable cell rate, and output maximum burst cell size for an ATM PVC, SVC, VC class, or VC bundle member.
vc-class atm	Creates a VC class for an ATM PVC, SVC, or ATM interface, and enters VC-class configuration mode.