Configuring Marking

- About Marking, on page 1
- Prerequisites for Marking, on page 2
- Guidelines and Limitations, on page 2
- Configuring Marking, on page 2
- Verifying the Marking Configuration, on page 8
- Configuration Examples for Marking, on page 8

About Marking

Marking is a method that you use to modify the QoS fields of the incoming and outgoing packets. The QoS fields that you can mark are IP precedence and differentiated services code point (DSCP) in Layer 3. The QoS group is a label local to the system to which you can assign intermediate marking values. You can use the QoS group label to determine the egress scheduling.

You can use marking commands in traffic classes that are referenced in a policy map. The marking features that you can configure are listed in the following table:

Table 1: Configurable Marking Features

Marking Feature	Description
DSCP	Layer 3 DSCP.
IP precedence	Layer 3 IP precedence. **Note** IP precedence uses only the lower three bits of the type of service (ToS) field. The device overwrites the first three bits of the ToS field to 0.
QoS group	Locally significant QoS values that can be manipulated and matched within the system. The range is from 0 to 7.
Ingress	Status of the marking applies to incoming packets.
CoS	Layer 2 VLAN ID

Prerequisites for Marking

Classification has the following prerequisites:

- You must be familiar with using modular QoS CLI.
- You are logged on to the device.

Guidelines and Limitations

Marking has the following configuration guidelines and limitations:

- **show** commands with the **internal** keyword are not supported.
- The **set qos-group** command can only be used in ingress policies.
- Control traffic, such as BPDUs, routing protocol packets, LACP/CDP/BFD, GOLD packets, glean traffic, and management traffic, are automatically classified into a control group based on a criteria. These packets are also given a dedicated buffer pool so that any congestion of data traffic does not affect control traffic. The control qos-group traffic classification cannot be modified.

Configuring Marking

You can combine one or more of the marking features in a policy map to control the setting of QoS values. You can then apply policies to either incoming or outgoing packets on an interface.

Note Do not press **Enter** after you use the **set** command and before you add the rest of the command. If you press **Enter** directly after entering the set keyword, you will be unable to continue to configure with the QoS configuration.

Configuring DSCP Marking

You can set the DSCP value in the six most significant bits of the DiffServ field of the IP header to a specified value. You can enter numeric values from 0 to 63, in addition to the standard DSCP values shown in the following table.

Table 2: Standard DSCP Values

Value	List of DSCP Values
af11	AF11 dscp (001010)—decimal value 10
af12	AF12 dscp (001100)—decimal value 12
af13	AF13 dscp (001110)—decimal value 14

Value	List of DSCP Values
af21	AF21 dscp (010010)—decimal value 18
af22	AF22 dscp (010100)—decimal value 20
af23	AF23 dscp (010110)—decimal value 22
af31	AF31 dscp (011010)—decimal value 26
af32	AF40 dscp (011100)—decimal value 28
af33	AF33 dscp (011110)—decimal value 30
af41	AF41 dscp (100010)—decimal value 34
af42	AF42 dscp (100100)—decimal value 36
af43	AF43 dscp (100110)—decimal value 38
cs1	CS1 (precedence 1) dscp (001000)—decimal value 8
cs2	CS2 (precedence 2) dscp (010000)—decimal value 16
cs3	CS3 (precedence 3) dscp (011000)—decimal value 24
cs4	CS4 (precedence 4) dscp (100000)—decimal value 32
cs5	CS5 (precedence 5) dscp (101000)—decimal value 40
cs6	CS6 (precedence 6) dscp (110000)—decimal value 48
cs7	CS7 (precedence 7) dscp (111000)—decimal value 56
default	Default dscp (000000)—decimal value 0
ef	EF dscp (101110)—decimal value 46

Note For more information about DSCP, see RFC 2475.

Step 1 Enter global configuration mode.

configure terminal

Step 2 Create or access the policy map named *policy-map-name* and then enters policy-map mode. The policy-map name can contain alphabetic, hyphen, or underscore characters, is case sensitive, and can be up to 40 characters.

policy-map [**type qos**] [**match-first**] *policy-map-name*

Step 3 Create a reference to *class-name* and enters policy-map class configuration mode. The class is added to the end of the policy map. Use the **class-default** keyword to select all traffic that is not currently matched by classes in the policy map.

class [**type qos**] {*class-name* | **class-default**}

Step 4 Set the DSCP value to *dscp-value*. Standard values are shown in the previous Standard DSCP Values table.

set dscp *dscp-value*

Example: Configuring DSCP Marking

This example shows how to display the policy-map configuration:

```
switch# show policy-map policy1
```

The following is a running configuration example. Replace the placeholders with relevant values for your setup.

```
configure terminal
     policy-map policy1
     class class1
     set dscp af31
```

Configuring IP Precedence Marking

You can set the value of the IP precedence field in bits 0–2 of the IPv4 type of service (ToS) field of the IP header.

Note The device rewrites the last 3 bits of the ToS field to 0 for packets that match this class.

Table 3: Precedence Values

Value	List of Precedence Values
0-7	IP precedence value
critical	Critical precedence (5)
flash	Flash precedence (3)
flash-override	Flash override precedence (4)
immediate	Immediate precedence (2)
internet	Internetwork control precedence (6)
network	Network control precedence (7)
priority	Priority precedence (1)
routine	Routine precedence (0)

Step 1 Enter global configuration mode.

configure terminal

Step 2 Create or access the policy map named *policy-map-name* and then enters policy-map mode. The policy-map name can contain alphabetic, hyphen, or underscore characters, is case sensitive, and can be up to 40 characters.

policy-map [**type qos**] [**match-first**] *policy-map-name*

Step 3 Create a reference to *class-name* and enters policy-map class configuration mode. The class is added to the end of the policy map.

class [**type qos**] {*class-name* | **class-default**}

Step 4 Set the IP precedence value to *precedence-value*. The value can range from 0 to 7. You can enter one of the values shown in the above Precedence Values table.

set precedence *precedence-value*

Example: Configuring IP Precedence Marking

The following is a running configuration example. Replace the placeholders with relevant values for your setup.

```
configure terminal
     policy-map policy1
     class class1
     set precedence 3
```

This example shows how to display the policy-map configuration:

```
show policy-map policy1
```

Configuring CoS Marking

You can set the value of the CoS field in the high-order three bits of the VLAN ID Tag field in the IEEE 802.1Q header.

Step 1 Enter global configuration mode.

configure terminal

Step 2 Create or access the policy map named *qos-policy-map-name*, and then enters policy-map mode. The policy-map name can contain alphabetic, hyphen, or underscore characters, is case sensitive, and can be up to 40 characters.

policy-map [**type qos**] [**match-first**] [*qos-policy-map-name* | **qos-dynamic**]

Step 3 Create a reference to *class-map-name*, and enters policy-map class configuration mode. The class is added to the end of the policy map unless **insert-before** is used to specify the class to insert before. Use the **class-default** keyword to select all traffic that is not currently matched by classes in the policy map.

class [**type qos**] {*class-map-name* | **class-default**} [**insert-before** *before-class-name*]

Step 4 Set the CoS value to *cos-value*. The value can range from 0 to 7.

set cos *cos-value*

Note VLAN QoS supports **set qos-group**. It does not support **set cos**.

Example: Configuring CoS Marking

The following is a running configuration example. Replace the placeholders with relevant values for your setup.

```
configure terminal
     policy-map policy1
     class class1
     set cos 3
```

This example shows how to display the policy-map configuration:

```
show policy-map policy1
```

Configuring Ingress Marking

You can apply the marking instructions in a QoS policy map to ingress packets by attaching that QoS policy map to an interface. To select ingress, you specify the **input** keyword in the **service-policy** command.

For more information, see the "Attaching and Detaching a QoS Policy Action" section.

Configuring DSCP Port Marking

You can set the DSCP value for each class of traffic defined in a specified ingress policy map.

The default behavior of the device is to preserve the DSCP value or to trust DSCP. To make the port untrusted, change the DSCP value. Unless you configure a QoS policy and attach that policy to specified interfaces, the DSCP value is preserved.

Note

- You can attach only one policy type qos map to each interface in each direction.
- The DSCP value is trust on the Layer 3 port of a Cisco NX-OS device.

Step 1 Enter global configuration mode.

switch# **configure terminal**

Step 2 Create or accesses the policy map named *policy-map-name* and then enters policy-map mode. The policy-map name can contain alphabetic, hyphen, or underscore characters, is case sensitive, and can be up to 40 characters.

switch(config)# **policy-map** [**type qos**] [**match-first**] [*policy-map-name*]

Step 3 Create a reference to *class-name* and enters policy-map class configuration mode. The class is added to the end of the policy map. Use the **class-default**keyword to select all traffic that is not currently matched by classes in the policy map.

switch(config-pmap-qos)# **class** [**type qos**] {*class-name* | **class-default**}

Step 4 Set the DSCP value to dscp-value. Valid values are listed in the Standard DSCP Values table in the Configuring DSCP Marking section.

switch(config-pmap-c-qos)# **set** *dscp-value*

Step 5 Return to policy-map configuration mode.

switch(config-pmap-c-qos)# **exit**

Step 6 Creates a reference to *class-name* and enters policy-map class configuration mode. The class is added to the end of the policy map. Use the **class-default** keyword to select all traffic that is not currently matched by classes in the policy map.

switch(config-pmap-qos)# **class** [**type qos**] {*class-name* | **class-default**}

Step 7 Sets the DSCP value to dscp-value. Valid values are listed in the Standard DSCP Values table in the Configuring DSCP Marking section.

switch(config-pmap-c-qos)# **set** *dscp-value*

Step 8 Returns to policy-map configuration mode.

switch(config-pmap-c-qos)# **exit**

Step 9 Create a reference to *class-name* and enters policy-map class configuration mode. The class is added to the end of the policy map. Use the **class-default** keyword to select all traffic that is not currently matched by classes in the policy map.

switch(config-pmap-qos)# **class** [**type qos**] {*class-name* | **class-default**}

Step 10 Set the DSCP value to dscp-value. Valid values are listed in the Standard DSCP Values table in the Configuring DSCP Marking section.

switch(config-pmap-c-qos)# **set** *dscp-value*

Step 11 Return to policy-map configuration mode.

switch(config-pmap-c-qos)# **exit**

Step 12 Enter interface mode to configure the Ethernet interface.

switch(config)# **interface ethernet** *slot/port*

Step 13 Add *policy-map-name* to the input packets of the interface. You can attach only one input policy and one output policy to an interface.

switch(config-if)# **service-policy** [**type qos**] {**input** | **output**} {*policy-map-name*} [**no-stats**]

Example: Configuring DSCP Port Marking

The following is a running configuration example. Replace the placeholders with relevant values for your setup.

```
configure terminal
    policy-map policy1
    class class1
    set dscp af31
    exit
```

```
    class class2
    set dscp af1
    exit
    class class-default
    set dscp af22
    exit
    interface ethernet 1/1
    service-policy input policy1
```

This example shows how to display the policy-map configuration:

```
switch# show policy-map policy1
```

Verifying the Marking Configuration

To display the marking configuration information, enter the following command:

show policy-map

Configuration Examples for Marking

The following example shows how to configure marking:

```
configure terminal
policy-map type qos untrust_dcsp
class class-default
set precedence 3
set qos-qroup 3
set dscp 0
```