



Configuring Marking

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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       | Internet 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-group 3
set dscp 0
```