



## Configuring Marking

- [About Marking, page 1](#)
- [Licensing Requirements for Marking, page 2](#)
- [Prerequisites for Marking, page 2](#)
- [Guidelines and Limitations, page 2](#)
- [Configuring Marking, page 3](#)
- [Verifying the Marking Configuration, page 10](#)
- [Configuration Examples for Marking, page 10](#)

## 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. <b>Note</b> 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.

Marking Feature	Description
QoS group	Locally significant QoS values that can be manipulated and matched within the system. The range is from 0 to 3.
Ingress	Status of the marking applies to incoming packets.
CoS	Layer 2 VLAN ID

## Licensing Requirements for Marking

The following table shows the licensing requirements for this feature:

Product	License Requirement
Cisco NX-OS	The QoS feature does not require a license. Any feature not included in a license package is bundled with the NX-OS image and is provided at no extra charge to you. For a complete explanation of the Cisco NX-OS licensing scheme, see the <i>Cisco NX-OS Licensing Guide</i> .

## 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:

- The **set qos-group** command can only be used in ingress policies.
- FEX host interfaces (HIF) are supported by the FEX QoS policy.
  - The FEX QoS policy is applied to the hardware resources of the fabric port associated with the FEX HIF port and not directly to the FEX device.
  - The FEX QoS policy supports QoS TCAM carving that is available on ALE enabled devices.

## 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 60, 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
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

Value	List of DSCP Values
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.

## SUMMARY STEPS

1. **configure terminal**
2. **policy-map [type qos] [match-first] *policy-map-name***
3. **class [type qos] {*class-name* | **class-default**} [**insert-before** *before-class-name*]**
4. **set dscp *dscp-value***

## DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> switch# configure terminal switch(config)#	Enters global configuration mode.
<b>Step 2</b>	<b>policy-map [type qos] [match-first] <i>policy-map-name</i></b>  <b>Example:</b> switch(config)# policy-map policy1 switch(config-pmap-qos)#	Creates or accesses the policy map named <i>policy-map-name</i> 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.
<b>Step 3</b>	<b>class [type qos] {<i>class-name</i>   <b>class-default</b>} [<b>insert-before</b> <i>before-class-name</i>]</b>	Creates a reference to <i>class-name</i> and enters policy-map class configuration mode. The class is added to the end of the policy map unless <b>insert-before</b> is used to specify the class to insert before. Use

	Command or Action	Purpose
	<b>Example:</b> <pre>switch(config-pmap-qos)# class class1 switch(config-pmap-c-qos)#</pre>	the <b>class-default</b> keyword to select all traffic that is not currently matched by classes in the policy map.
<b>Step 4</b>	<b>set dscp dscp-value</b>  <b>Example:</b> <pre>switch(config-pmap-c-qos)# set dscp af31</pre>	Sets the DSCP value to <i>dscp-value</i> . Standard values are shown in the previous Standard DSCP Values table.  When the QoS policy is applied on the VLAN configuration level, the DSCP value derives the CoS value for bridged and routed traffic from the 3 most significant DSCP bits.

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

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

## 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)

## SUMMARY STEPS

1. **configure terminal**
2. **policy-map** [**type qos**] [**match-first**] *policy-map-name*
3. **class** [**type qos**] {*class-name* | **class-default**} [**insert-before** *before-class-name*]
4. **set precedence** *precedence-value*

## DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> switch# configure terminal switch(config)#	Enters global configuration mode.
<b>Step 2</b>	<b>policy-map</b> [ <b>type qos</b> ] [ <b>match-first</b> ] <i>policy-map-name</i>  <b>Example:</b> switch(config)# policy-map policy1 switch(config-pmap-qos)#	Creates or accesses the policy map named <i>policy-map-name</i> 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.
<b>Step 3</b>	<b>class</b> [ <b>type qos</b> ] { <i>class-name</i>   <b>class-default</b> } [ <b>insert-before</b> <i>before-class-name</i> ]  <b>Example:</b> switch(config-pmap-qos)# class class1 switch(config-pmap-c-qos)#	Creates a reference to <i>class-name</i> and enters policy-map class configuration mode. The class is added to the end of the policy map unless <b>insert-before</b> is used to specify the class to insert before.
<b>Step 4</b>	<b>set precedence</b> <i>precedence-value</i>  <b>Example:</b> switch(config-pmap-c-qos)# set precedence 3	Sets the IP precedence value to <i>precedence-value</i> . The value can range from 0 to 7. You can enter one of the values shown in the above Precedence Values table.

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

```
switch# 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.

## SUMMARY STEPS

1. **configure terminal**
2. **policy-map** [**type qos**] [**match-first**] [*qos-policy-map-name* | **qos-dynamic**]
3. **class** [**type qos**] {*class-map-name* | **class-default**} [**insert-before** *before-class-name*]
4. **set cos** *cos-value*

## DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> switch# configure terminal switch(config)#	Enters global configuration mode.
<b>Step 2</b>	<b>policy-map</b> [ <b>type qos</b> ] [ <b>match-first</b> ] [ <i>qos-policy-map-name</i>   <b>qos-dynamic</b> ]  <b>Example:</b> switch(config)# policy-map policy1 switch(config-pmap-qos)#	Creates or accesses the policy map named <i>qos-policy-map-name</i> , 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.
<b>Step 3</b>	<b>class</b> [ <b>type qos</b> ] { <i>class-map-name</i>   <b>class-default</b> } [ <b>insert-before</b> <i>before-class-name</i> ]  <b>Example:</b> switch(config-pmap-qos)# class class1 switch(config-pmap-c-qos)#	Creates a reference to <i>class-map-name</i> , and enters policy-map class configuration mode. The class is added to the end of the policy map unless <b>insert-before</b> is used to specify the class to insert before. Use the <b>class-default</b> keyword to select all traffic that is not currently matched by classes in the policy map.
<b>Step 4</b>	<b>set cos</b> <i>cos-value</i>  <b>Example:</b> switch(config-pmap-c-qos)# set cos 3 switch(config-pmap-c-qos)#	Sets the CoS value to <i>cos-value</i> . The value can range from 0 to 7.

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

```
switch# 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.

### SUMMARY STEPS

1. **configure terminal**
2. **policy-map** [**type qos**] [**match-first**] [*policy-map-name*]
3. **class** [**type qos**] {*class-name* | **class-default**} [**insert-before** *before-class-name*]
4. **set dscp-value**
5. **exit**
6. **class** [**type qos**] {*class-name* | **class-default**} [**insert-before** *before-class-name*]
7. **set dscp-value**
8. **exit**
9. **class** [**type qos**] {*class-name* | **class-default**} [**insert-before** *before-class-name*]
10. **set dscp-value**
11. **exit**
12. **interface ethernet slot/port**
13. **service-policy** [**type qos**] {**input** | **output**} {*policy-map-name*} [**no-stats**]

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> switch# configure terminal switch(config)#	Enters global configuration mode.
<b>Step 2</b>	<b>policy-map</b> [ <b>type qos</b> ] [ <b>match-first</b> ] [ <i>policy-map-name</i> ]  <b>Example:</b> switch(config)# policy-map policy1 switch(config-pmap-qos)#	Creates or accesses the policy map named <i>policy-map-name</i> 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.



	Command or Action	Purpose
Step 3	<b>class</b> [ <b>type qos</b> ] { <i>class-name</i>   <b>class-default</b> } [ <b>insert-before</b> <i>before-class-name</i> ]  <b>Example:</b> <pre>switch(config-pmap-qos)# class class1 switch(config-pmap-c-qos)#</pre>	Creates a reference to <i>class-name</i> and enters policy-map class configuration mode. The class is added to the end of the policy map unless <b>insert-before</b> is used to specify the class to insert before. Use the <b>class-default</b> keyword to select all traffic that is not currently matched by classes in the policy map.
Step 4	<b>set dscp-value</b>  <b>Example:</b> <pre>switch(config-pmap-c-qos)# set dscp af31</pre>	Sets the DSCP value to <i>dscp-value</i> . Valid values are listed in the Standard DSCP Values table in the Configuring DSCP Marking section.
Step 5	<b>exit</b>  <b>Example:</b> <pre>switch(config-pmap-c-qos)# exit switch(config-pmap-qos)#</pre>	Returns to policy-map configuration mode.
Step 6	<b>class</b> [ <b>type qos</b> ] { <i>class-name</i>   <b>class-default</b> } [ <b>insert-before</b> <i>before-class-name</i> ]  <b>Example:</b> <pre>switch(config-pmap-qos)# class class2 switch(config-pmap-c-qos)#</pre>	Creates a reference to <i>class-name</i> and enters policy-map class configuration mode. The class is added to the end of the policy map unless <b>insert-before</b> is used to specify the class to insert before. Use the <b>class-default</b> keyword to select all traffic that is not currently matched by classes in the policy map.
Step 7	<b>set dscp-value</b>  <b>Example:</b> <pre>switch(config-pmap-c-qos)# set dscp af1</pre>	Sets the DSCP value to <i>dscp-value</i> . Valid values are listed in the Standard DSCP Values table in the Configuring DSCP Marking section.
Step 8	<b>exit</b>  <b>Example:</b> <pre>switch(config-pmap-c-qos)# exit switch(config-pmap-qos)#</pre>	Returns to policy-map configuration mode.
Step 9	<b>class</b> [ <b>type qos</b> ] { <i>class-name</i>   <b>class-default</b> } [ <b>insert-before</b> <i>before-class-name</i> ]  <b>Example:</b> <pre>switch(config-pmap-qos)# class class-default switch(config-pmap-c-qos)#</pre>	Creates a reference to <i>class-name</i> and enters policy-map class configuration mode. The class is added to the end of the policy map unless <b>insert-before</b> is used to specify the class to insert before. Use the <b>class-default</b> keyword to select all traffic that is not currently matched by classes in the policy map.
Step 10	<b>set dscp-value</b>  <b>Example:</b> <pre>switch(config-pmap-c-qos)# set dscp af22 switch(config-pmap-c-qos)#</pre>	Sets the DSCP value to <i>dscp-value</i> . Valid values are listed in the Standard DSCP Values table in the Configuring DSCP Marking section.
Step 11	<b>exit</b>  <b>Example:</b> <pre>switch(config-pmap-c-qos)# exit switch(config-pmap-qos)#</pre>	Returns to policy-map configuration mode.

	Command or Action	Purpose
Step 12	<b>interface ethernet <i>slot/port</i></b>  <b>Example:</b> <pre>switch(config)# interface ethernet 1/1 switch(config-if)#</pre>	Enters interface mode to configure the Ethernet interface.
Step 13	<b>service-policy [type qos] {input   output} {<i>policy-map-name</i>} [no-stats]</b>  <b>Example:</b> <pre>switch(config-if)# service-policy input policy1</pre>	Adds <i>policy-map-name</i> to the input packets of the interface. You can attach only one input policy and one output policy to an interface.

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, perform one of the following tasks:

Command	Purpose
<b>show policy-map</b>	Displays all policy maps.

## 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
```