



# Enhanced Packet Marking

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The Enhanced Packet Marking feature allows you to map and convert the marking of a packet from one value to another by using a kind of conversion chart called a table map. The table map establishes an equivalency from one value to another. For example, the table map can map and convert the class of service (CoS) value of a packet to the precedence value of the packet. This value mapping can be propagated for use on the network, as needed.

## Feature Specifications for Enhanced Packet Marking

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### Feature History

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Release	Modification
12.2(13)T	This feature was introduced.

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### Supported Platforms

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For platforms supported in Cisco IOS Release 12.2(13)T, consult Cisco Feature Navigator.

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## Determining Platform Support Through Cisco Feature Navigator

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Cisco Feature Navigator is a web-based tool that enables you to quickly determine which Cisco IOS software images support a specific set of features and which features are supported in a specific Cisco IOS image. You can search by feature or release. Under the release section, you can compare releases side by side to display both the features unique to each software release and the features in common.

To access Cisco Feature Navigator, you must have an account on Cisco.com. If you have forgotten or lost your account information, send a blank e-mail to [cco-locksmith@cisco.com](mailto:cco-locksmith@cisco.com). An automatic check will verify that your e-mail address is registered with Cisco.com. If the check is successful, account details with a new random password will be e-mailed to you. Qualified users can establish an account on Cisco.com by following the directions found at this URL:

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<http://www.cisco.com/go/fn>

### Availability of Cisco IOS Software Images

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## Prerequisites for Enhanced Packet Marking

To use the Enhanced Packet Marking feature, you must have Cisco Express Forwarding (CEF) configured on both the interface sending the packet and the interface receiving the packet. For more information on CEF, refer to the *Cisco IOS Switching Services Configuration Guide*, Release 12.2.

**Note**

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The Enhanced Packet Marking feature can mark both locally generated packets and CEF-switched packets.

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## Restrictions for Enhanced Packet Marking

If a policy map contains the `set cos` command and the policy map is to be attached to an IEEE 802.1Q interface, the policy map can be attached only as an output policy. For more information about attaching policy maps to interfaces, see the “[Attaching the Policy Map to the Interface](#)” section on page 9.

## Information About Enhanced Packet Marking

To configure Enhanced Packet Marking, you need to understand the following concepts:

- [Benefits of Enhanced Packet Marking, page 3](#)
- [Modular Quality of Service Command-Line Interface, page 4](#)

## Benefits of Enhanced Packet Marking

The Cisco IOS quality of service (QoS) software enables you to mark packets with values such as the CoS value, the Multiprotocol Label Switching (MPLS) EXP value, the QoS group value, the precedence value, or the differentiated services code point (DSCP) value set in the header of a packet.

Before the Enhanced Packet Marking feature was available, marking the value of a packet was accomplished by using separate **set** commands (for example, the **set precedence** command, the **set dscp** command, and the **set cos** command). With this feature, you can create a table map in which the packet values can be defined and then used to mark packets. Rather than using the individual **set** commands to mark the packet values, you can define the values *once* in the table map.

A table map is a kind of two-way conversion chart that lists and maps one packet-marking value to another. A table map supports a many-to-one type of conversion and mapping scheme. The table map establishes a “to – from” relationship for the packet-marking values: a packet-marking value is set *to* one value that is taken *from* another value. The values are based on specific packet-marking types or categories, such as precedence or DSCP.

[Table 1](#) lists the packet-marking types for which a “to–from” relationship can be established using the table map.

**Table 1 Packet-Marking Types for Which a To–From Relationship Can Be Established**

The “To” Packet-Marking Type	The “From” Packet-Marking Type
Precedence	CoS
	QoS group
DSCP	CoS
	QoS group
CoS	Precedence
	DSCP
QoS group	Precedence
	DSCP
	MPLS EXP topmost
MPLS EXP topmost	QoS group
MPLS EXP imposition	Precedence
	DSCP

The table map can be configured for use with *multiple* policy maps. The policy maps can then be configured to convert and propagate the packet-marking values defined in the table map. Then the policy maps can be attached to the input or output interface of either the ingress or egress router, as appropriate to serve the QoS requirements of your network.

## Modular Quality of Service Command-Line Interface

To configure the Enhanced Packet Marking feature, you must create table maps using the **table-map** (value mapping) command.

Once the table map has been created, traffic classes are defined and traffic policies (policy maps) are created and configured to use the table maps. Then the traffic policies (policy maps) are attached to the appropriate interfaces.

The Modular Quality of Service (QoS) Command-Line Interface (CLI) (MQC) is a command-line interface that allows you to define traffic classes, create and configure traffic policies (policy maps), and then attach these traffic policies to interfaces.

In the MQC, the **class-map** command is used to define a traffic class (which is then associated with a traffic policy). The purpose of a traffic class is to classify traffic.

The MQC consists of the following three processes:

- Defining a traffic class with the **class-map** command.
- Creating a traffic policy by associating the traffic class with one or more QoS features (using the **policy-map** command).
- Attaching the traffic policy to the interface with the **service-policy** command.

A traffic class contains three major elements: a name, a series of **match** commands, and, if more than one **match** command exists in the traffic class, an instruction on how to evaluate these **match** commands (that is, match-all or match-any). The traffic class is named in the **class-map** command line; for example, if you enter the **class-map cisco** command while configuring the traffic class in the CLI, the traffic class would be named “cisco”.

The **match** commands are used to specify various criteria for classifying packets. Packets are checked to determine whether they match the criteria specified in the **match** commands. If a packet matches the specified criteria, that packet is considered a member of the class and is forwarded according to the QoS specifications set in the traffic policy. Packets that fail to meet any of the matching criteria are classified as members of the default traffic class.

## How to Configure Enhanced Packet Marking

This section describes the following tasks. Each task is identified as either required or optional.

- [Creating a Table Map, page 5](#) (required)
- [Configuring a Policy Map, page 6](#) (required)
- [Attaching the Policy Map to the Interface, page 9](#) (required)
- [Verifying the Table Map and the Policy Maps, page 11](#) (optional)

## Creating a Table Map

The table map contains the mapping scheme used for establishing the “to–from” relationship and equivalency between one packet-marking value and another.

To create and configure the table map, use the following commands:

### SUMMARY STEPS

1. **enable**
2. **configure** { **terminal** | **memory** | **network** }
3. **table-map** *table-map-name* **map from** *from-value* **to** *to-value* [**default** *default-action-or-value*]
4. **exit**

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables higher privilege levels, such as privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure</b> { <b>terminal</b>   <b>memory</b>   <b>network</b> }  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
Step 3	<b>table-map</b> <i>table-map-name</i> <b>map from</b> <i>from-value</i> <b>to</b> <i>to-value</i> [ <b>default</b> <i>default-action-or-value</i> ]  <b>Example:</b> Router(config)# table-map table-map1 map from 2 to 1	Creates a table map using the specified name and enters tablemap configuration mode. <ul style="list-style-type: none"> <li>• Enter the name of the table map you want to create.</li> <li>• This command creates a to–from relationship between specified values.</li> <li>• Enter each value mapping on a separate line. Enter as many separate lines as needed for the values you want to map.</li> <li>• The <b>default</b> keyword and <i>default-action-or-value</i> argument sets the default value (or action) to be used if a value is not explicitly designated.</li> </ul>
Step 4	<b>exit</b>  <b>Example:</b> Router(config-tablemap)# exit	(Optional) Exits tablemap configuration mode.

## Configuring a Policy Map

After the table map has been created, a policy map must be created and configured to use the table map. This policy map sets the packet-marking values (for example, the precedence value, the DSCP value, or the CoS value) according to those values defined in the table map.

To create and configure the policy map, use the following commands:

### SUMMARY STEPS

1. **enable**
2. **configure** { **terminal** | **memory** | **network** }
3. **policy map** *policy-map-name*
4. **class** { *class-name* | **class-default** }
5. **set precedence cos table** *table-map-name*  
or  
**set dscp cos table** *table-map-name*  
or  
**set cos precedence table** *table-map-name*  
or  
**set cos dscp table** *table-map-name*  
or  
**set qos-group precedence table** *table-map-name*  
or  
**set qos-group dscp table** *table-map-name*  
or  
**set mpls experimental topmost qos-group table** *table-map-name*  
or  
**set mpls experimental imposition precedence table** *table-map-name*  
or  
**set mpls experimental imposition dscp table** *table-map-name*  
or  
**set qos-group mpls exp topmost table** *table-map-name*  
or  
**set precedence qos-group table** *table-map-name*  
or  
**set dscp qos-group table** *table-map-name*
6. **exit**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<p><b>enable</b></p> <p><b>Example:</b> Router&gt; enable</p>	<p>Enables higher privilege levels, such as privileged EXEC mode.</p> <ul style="list-style-type: none"> <li>Enter your password if prompted.</li> </ul>
Step 2	<p><b>configure {terminal   memory   network}</b></p> <p><b>Example:</b> Router# configure terminal</p>	<p>Enters global configuration mode.</p>
Step 3	<p><b>policy map <i>policy-map-name</i></b></p> <p><b>Example:</b> Router(config)# policy map policy1</p>	<p>Creates a policy map using the specified name and enters policy map configuration mode.</p> <ul style="list-style-type: none"> <li>Enter name of policy map you want to create.</li> </ul>
Step 4	<p><b>class {<i>class-name</i>   class-default}</b></p> <p><b>Example:</b> Router(config-pmap)# class class-default</p>	<p>Creates the specified class (or the default class) and enters policy-map class configuration mode.</p>
Step 5	<p><b>set precedence cos table <i>table-map-name</i></b></p> <p><b>Example:</b> Router(config-pmap-c)# set precedence cos table table-map1</p> <p>or</p> <p><b>set dscp cos table <i>table-map-name</i></b></p> <p><b>Example:</b> Router(config-pmap-c)# set dscp cos table table-map1</p> <p>or</p> <p><b>set cos precedence table <i>table-map-name</i></b></p> <p><b>Example:</b> Router(config-pmap-c)# set cos precedence table table-map-cos</p> <p>or</p> <p><b>set cos dscp table <i>table-map-name</i></b></p> <p><b>Example:</b> Router(config-pmap-c)# set cos dscp table table-map-dscp</p>	<p>Sets the precedence value based on the CoS value (or action) defined in the table map created earlier.</p> <p>or</p> <p>Sets the DSCP value based on the CoS value (or action) defined in the table map created earlier.</p> <p>or</p> <p>Sets the CoS value based on the precedence value (or action) defined in the table map created earlier.</p> <p>or</p> <p>Sets the CoS value based on the DSCP value (or action) defined in the table map created earlier.</p>

Command or Action	Purpose
<p>or</p> <pre>set qos-group precedence table table-map-name</pre>	<p>or</p> <p>Sets the QoS group value based on the precedence value (or action) defined in the table map created earlier.</p>
<p><b>Example:</b></p> <pre>Router(config-pmap-c)# set qos-group precedence table table-map1</pre>	
<p>or</p> <pre>set qos-group dscp table table-map-name</pre>	<p>or</p> <p>Sets the QoS group value based on the DSCP value (or action) as defined in the table map created earlier.</p>
<p><b>Example:</b></p> <pre>Router(config-pmap-c)# set qos-group dscp table table-map1</pre>	
<p>or</p> <pre>set mpls experimental topmost qos-group table table-map-name</pre>	<p>or</p> <p>Sets the MPLS EXP value based on the QoS group value (or action) as defined in the table map created earlier.</p>
<p><b>Example:</b></p> <pre>Router(config-pmap-c)# set mpls experimental topmost qos-group table table-map1</pre>	
<p>or</p> <pre>set mpls experimental imposition precedence table table-map-name</pre>	<p>or</p> <p>Sets the MPLS EXP value (during MPLS label imposition) based on the precedence value (or action) as defined in the table map created earlier.</p>
<p><b>Example:</b></p> <pre>Router(config-pmap-c)# set mpls experimental imposition precedence table table-map1</pre>	
<p>or</p> <pre>set mpls experimental imposition dscp table table-map-name</pre>	<p>or</p> <p>Sets the MPLS EXP value based on the DSCP value (or action) as defined in the table map created earlier.</p>
<p><b>Example:</b></p> <pre>Router(config-pmap-c)# set mpls experimental imposition dscp table table-map1</pre>	
<p>or</p> <pre>set qos-group mpls exp topmost table table-map-name</pre>	<p>Sets the QoS group value based on the MPLS EXP value defined in the table map.</p>
<p><b>Example:</b></p> <pre>Router(config-pmap-c)# set qos-group mpls exp topmost table table-map1</pre>	
<p>or</p>	<p>or</p>

Command or Action	Purpose
<p><b>set precedence qos-group table</b> <i>table-map-name</i></p> <p><b>Example:</b>  Router(config-pmap-c)# set precedence qos-group table table-map1</p> <p>or</p> <p><b>set dscp qos-group table</b> <i>table-map-name</i></p> <p><b>Example:</b>  Router(config-pmap-c)# set dscp qos-group table table-map1</p>	<p>Sets the precedence value based on the QoS group value defined in the table map created earlier.</p> <p>or</p> <p>Sets the DSCP value based on the QoS group value defined in the table map created earlier.</p>
<p><b>Step 6</b> <b>exit</b></p> <p><b>Example:</b>  Router(config-pmap-c)# exit</p>	<p>(Optional) Exits policy-map class configuration mode.</p>

## What To Do Next

Create and configure as many policy maps as you must have to serve the QoS requirements of your network. To create and configure any additional policy maps you need, repeat the steps in the [“Configuring a Policy Map”](#) section on page 6. Then attach the policy maps to the appropriate interface, following the instructions in the [“Attaching the Policy Map to the Interface”](#) section on page 9.

## Attaching the Policy Map to the Interface

The policy map or maps you have created must be attached to the appropriate interface, according to the needs of your network. For example, you may have to attach policy maps to either the input or the output interface on either the ingress or the egress router.

To attach a policy map to the appropriate interface, use the following commands:

### SUMMARY STEPS

1. **enable**
2. **configure** {terminal | memory | network}
3. **interface** *type number*
4. **pvc** [*name*] *vpi/vci* [*ilmi* | *qsaal* | *smds*]
5. **service-policy** {input | output} *policy-map-name*
6. **exit**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables higher privilege levels, such as privileged EXEC mode. <ul style="list-style-type: none"><li>Enter your password if prompted.</li></ul>
Step 2	<b>configure</b> { <b>terminal</b>   <b>memory</b>   <b>network</b> }  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
Step 3	<b>interface</b> <i>type number</i> [ <i>name-tag</i> ]  <b>Example:</b> Router(config)# interface FastEthernet1/0.1	Configures the interface type specified and enters interface configuration mode. <ul style="list-style-type: none"><li>Enter interface type.</li></ul>
Step 4	<b>pvc</b> [ <i>name</i> ] <i>vpi/vci</i> [ <b>ilmi</b>   <b>qsaal</b>   <b>smds</b> ]  <b>Example:</b> Router(config-if)# pvc cisco 0/16 ilmi	(Optional) Creates or assigns a name to an ATM PVC and specifies the encapsulation type on an ATM PVC. <b>Note</b> This step is required only if you are attaching the policy map to an ATM PVC. If you are not attaching the policy map to an ATM PVC, skip this step and proceed with <a href="#">Step 5</a> .  Enters ATM VC configuration mode.
Step 5	<b>service-policy</b> { <b>input</b>   <b>output</b> } <i>policy-map-name</i>  <b>Example:</b> Router(config-if)# service-policy input policy1	Specifies the name of the policy map to be attached to the <i>input or output</i> direction of the interface. <b>Note</b> Policy maps can be configured on ingress or egress routers. They can also be attached in the input or output direction of an interface. The direction (input or output) and the router (ingress or egress) to which the policy map should be attached varies according your network configuration. When using the <b>service-policy</b> command to attach the policy map to an interface, be sure to choose the router and the interface direction that are appropriate for your network configuration. <ul style="list-style-type: none"><li>Enter the policy map name.</li></ul>
Step 6	<b>exit</b>  <b>Example:</b> Router(config-if)# exit	(Optional) Exits global configuration mode.

## Verifying the Table Map and the Policy Maps

This task allows you to verify the following items:

- The table map has been created correctly.
- The policy maps have been configured correctly.
- The policy maps have been attached to the correct input or output interface of the ingress or egress router.
- The feature is mapping, converting, and propagating the values as expected.

To verify the table map and the policy maps, use the following commands:

### SUMMARY STEPS

1. **enable**
2. **show table-map** [*table-map-name*]  
or  
**show policy-map**  
or  
**show policy-map interface** *interface-name*
3. **exit**

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables higher privilege levels, such as privileged EXEC mode.  • Enter your password if prompted.
Step 2	<b>show table-map</b> [ <i>table-map-name</i> ]  <b>Example:</b> Router# show table-map map1  or <b>show policy-map</b>  <b>Example:</b> Router# show policy-map policy1  or	Displays the configuration of a specified table map or all table maps.  or Displays all configured policy maps.  or

<p><b>Command or Action</b></p> <pre>show policy-map interface interface-name</pre> <p><b>Example:</b> Router# show policy-map interface s4/0</p>	<p><b>Purpose</b></p> <p>Displays the packet statistics of all classes that are configured for all service policies either on the specified interface or subinterface or on a specific permanent virtual circuit (PVC) on the interface.</p> <ul style="list-style-type: none"> <li>• Enter the interface name.</li> </ul>
<p><b>Step 3</b>    <b>exit</b></p> <p><b>Example:</b> Router# exit</p>	<p>(Optional) Exits EXEC mode.</p>

## Troubleshooting Tips

The commands in the [“Verifying the Table Map and the Policy Maps” section on page 11](#) allow you to verify that you achieved the intended configuration and that the feature is functioning correctly. If, after using the **show** commands listed above, you find that the configuration is not correct or the feature is not functioning as expected, perform these operations:

If the configuration is not the one you intended, complete the following procedures:

- Use the **show running config** command and analyze the output of the command.
- If the policy map does not appear in the output of the **show running config** command, enable the **logging console** command.
- Attach the policy map to the interface again.

If the packets are not being matched correctly (for example, the packet counters are not incrementing correctly), complete the following procedures:

- Use the **show policy-map** command, and analyze the output of the command.
- Use the **show running config** command, and analyze the output of the command.
- Use the **show policy-map interface** command, and analyze the output of the command. Check the the following findings:
  - If a policy map applies queueing, and the packets are matching the correct class, but you see unexpected results, compare the number of the packets in the queue with the number of the packets matched.
  - Because CEF is required for this feature (see the [“Prerequisites for Enhanced Packet Marking” section on page 2](#)), verify that CEF is enabled.
  - If the interface is congested, and only a small number of the packets are being matched, check the tuning of the tx ring, and evaluate whether the queueing is happening on the tx ring. To do this, use the **show controllers** command, and look at the value of the tx count in the output of the command.

# Configuration Examples for Enhanced Packet Marking

This section provides the following configuration examples:

- [Configuring Enhanced Packet Marking \(CoS Values\) Example, page 13](#)
- [Configuring Enhanced Packet Marking \(MPLS EXP Values\) Example, page 14](#)
- [Verifying the Table Map Configuration Example, page 16](#)

## Configuring Enhanced Packet Marking (CoS Values) Example

This section contains an example of the Enhanced Packet Marking feature configured to map CoS values.

In the example, the **table-map** (value mapping) command has been used to create and configure a table map called “table-map1”. This table map will be used to establish a “to–from” relationship between one packet-marking value and another.

In “table-map1”, a packet-marking value of 0 will be mapped to a value of 1. A packet-marking value of 2 will be mapped to a packet-marking value of 3. All other packet-marking values will, by default, be mapped to a packet-marking value of 4.

```
Router(config)# table-map table-map1
Router(config-tablemap)# map from 0 to 1
Router(config-tablemap)# map from 2 to 3
Router(config-tablemap)# default 4
Router(config-tablemap)# exit
```

A policy map called “policy1” has been created and configured to use “table-map1” for setting the precedence value. In this example, the CoS value will be set according to the DSCP value defined in “table-map1”.

```
Router(config)# policy map policy1
Router(config-pmap)# class class-default
Router(config-pmap-c)# set cos dscp table table-map1
Router(config-pmap-c)# exit
```



### Note

As an alternative to configuring the **set cos dscp table table-map1** command shown in the example, you could configure the command without specifying the **table** keyword and the applicable *table-map-name* argument (that is, you could configure the **set cos dscp** command). When the command is configured without the **table** keyword and applicable table map name, the values are copied from the specified categories. In this case, the DSCP value is copied and used to set the CoS value.

Note, however, that when the DSCP value is copied and used for the CoS value only the *first three bits* (that is, the class selector bits) of the DSCP value will be used to set the CoS value. For example, if the DSCP value is EF (101110), the first 3 bits of this DSCP value will be used to set the CoS value, resulting in a CoS value of 5 (101).

For more information about the various **set** commands available for use with this feature, see the [“Command Reference” section on page 19](#).

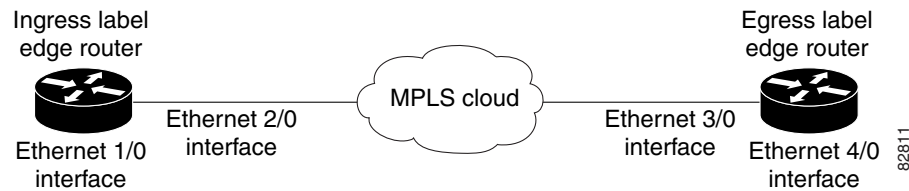
The next process in the configuration is attaching the policy map to the output interface on the ingress router. In this example, “policy1” is attached to a FastEthernet 1/0 interface.

```
Router(config)# interface FastEthernet1/0
Router(config-if)# service-policy output policy1
Router(config-if)# exit
```

## Configuring Enhanced Packet Marking (MPLS EXP Values) Example

This section contains an example of the Enhanced Packet Marking feature configured to map MPLS experimental (EXP) values. [Figure 1](#) illustrates the network topology for this configuration example.

**Figure 1** Network Topology for the Enhanced Packet Marking (MPLS EXP Value) Example



For this configuration example, an IP packet arrives at the input interface (an Ethernet 1/0 interface) of the ingress label edge router (LER). The precedence value is copied and used as the MPLS EXP value of the packet when the MPLS label is imposed. This label imposition takes place at the ingress LER.

The packet leaves the ingress LER through the output interface (an Ethernet 2/0 interface), traverses through the network backbone into the MPLS cloud, and enters the egress LER.

At the input interface of the egress LER (an Ethernet 3/0 interface), the MPLS EXP value is copied and used as the QoS group value. At the output interface of the egress LER (an Ethernet 4/0 interface), the QoS group value is copied and used as the precedence value.

To accomplish configuration described above, three separate policy maps were required—policy1, policy2, and policy3. Each policy map is configured to convert and propagate different packet-marking values.

The first policy map, “policy1”, is configured to copy the precedence value of the packet and use it as the MPLS EXP value during label imposition.

```
Router(config)# policy map policy1
Router(config-pmap)# class class-default
Router(config-pmap-c)# set mpls experimental imposition precedence
Router(config-pmap-c)# exit
```

Policy map “policy1” must now be attached to the input interface on the ingress LER, as shown below. In this example, “policy1” is attached to an Ethernet 1/0 interface.

```
Router(config)# interface Ethernet1/0
Router(config-if)# service-policy input policy1
Router(config-if)# exit
```

When the packet leaves the LER through the output interface (the Ethernet 2/0 interface), the MPLS EXP value is copied from the precedence value during MPLS label imposition. Copying the MPLS EXP value from the precedence value ensures that the MPLS EXP value reflects the appropriate QoS treatment. The packet now proceeds through the MPLS cloud into the egress LER.

A second policy map called “policy2” has been configured to copy the MPLS EXP value in the incoming MPLS packet to the QoS group value. The QoS group value is used for internal purposes only. The QoS group value can be used with output queueing on the output interface of the egress router. The QoS group value can also be copied and used as the precedence value, as packets leave the egress LER through the output interface (the Ethernet 4/0 interface).

```
Router(config)# policy map policy2
Router(config-pmap)# class class-default
Router(config-pmap-c)# set qos-group mpls experimental topmost
Router(config-pmap-c)# exit
```

Policy map “policy2” must now be attached to the input interface on the ingress LER. In this example, “policy2” is attached to the Ethernet 3/0 interface.

```
Router(config)# interface Ethernet3/0
Router(config-if)# service-policy input policy2
Router(config-if)# exit
```

A third policy map called “policy3” has been configured to copy the internal QoS group value (previously based on the MPLS EXP value) to the precedence value. The QoS group value will be copied to the precedence value as the packet leaves the egress LER through the output interface.

```
Router(config)# policy map policy3
Router(config-pmap)# class class-default
Router(config-pmap-c)# set precedence qos-group
Router(config-pmap-c)# exit
```

Policy map “policy3” must now be attached to the output interface on the egress LER. In this example, “policy3” is attached to the Ethernet 4/0 interface.

```
Router(config)# interface Ethernet4/0
Router(config-if)# service-policy output policy3
Router(config-if)# exit
```

Configuring these policy maps as shown (and attaching them to the correct interfaces), causes the appropriate quality of service treatment to be preserved for the packet as the packet progresses along an IP network, through an MPLS cloud, and back again into an IP network.

**Note**

This configuration could also have been accomplished by first creating a table map (used to map one value to another) and then specifying the **table** keyword and *table-map-name* argument in each of the **set** commands (for example, **set precedence qos-group table tablemap1**). For an example of a configuration in which a table map was created first, see the [“Configuring Enhanced Packet Marking \(CoS Values\) Example”](#) section on page 13.

In the MPLS configuration example, a table map was not created, and the **set** commands were configured without specifying the **table** keyword and *table-map-name* argument (for example, **set precedence qos-group**).

When the **set** commands are configured without specifying the **table** keyword and *table-map-name* argument, the values are copied from the specified categories. In this case, the QoS group value was copied and used to set the precedence value.

Note, however, that when the DSCP value is copied and used for the MPLS EXP value, only the *first three bits* (that is, the class selector bits) of the DSCP value will be used to set the MPLS value.

For more information about the various **set** commands available for use with this feature, see the [“Command Reference”](#) section on page 19.

## Verifying the Table Map Configuration Example

To verify a table map configuration, you can use the **show table-map** command, the **show policy-map** command, and the **show policy-map interface** command.

The **show table-map** command displays the contents of one or more table maps. The **show policy-map** command and the **show policy-map interface** command display the contents and configurations of policy maps. The output of these two commands can be used to verify that the table map has been configured in the policy map and that the policy map is attached to the appropriate interface.

The following sample output of the **show table-map** command displays the contents of a table map called “map1”. In this table map, a packet-marking value of 0 is mapped to a packet-marking value of 1. All other packet-marking values are mapped to the default value 3.

```
Router# show table-map map1
```

```
Table Map map1
from 0 to 1
default 3
```

The following sample output of the **show policy-map** command displays the configuration for service policies called “policy1” and “policy2”. In “policy1”, a table map called “table-map1” has been configured to determine the precedence based on the CoS value. In “policy2”, a table map called “table-map2” has been configured to determine the CoS value based on the precedence value.

```
Router# show policy-map policy1
```

```
Policy Map policy1
Class class-default
set precedence cos table table-map1
```

```
Router# show policy-map policy2
```

```
Policy Map policy2
Class class-default
set cos precedence table table-map2
```

The following sample output of the **show policy-map interface** command shows the service policies attached to a FastEthernet subinterface. In this example, a service policy called “policy1” has been attached. In “policy1”, a table map called “table-map1” has been configured. The values in “table-map1” will be used to map the precedence values according to the values defined in the table map.

```
Router# show policy-map interface
```

```
FastEthernet1/0.1

Service-policy input: policy1

Class-map: class-default (match-any)
 0 packets, 0 bytes
 5 minute offered rate 0 bps, drop rate 0 bps
Match: any
QoS Set
  precedence cos table table-map1
  Packets marked 0
```

## Additional References

The following sections provide additional references related to Enhanced Packet Marking:

- [Related Documents, page 17](#)
- [Standards, page 17](#)
- [MIBs, page 18](#)
- [RFCs, page 18](#)
- [Technical Assistance, page 18](#)

## Related Documents

Related Topic	Document Title
QoS commands: complete command syntax, command modes, command history, defaults, usage guidelines, and examples	<i>Cisco IOS Quality of Service Solutions Command Reference</i> , Release 12.2
Modular QoS CLI (MQC)	“Modular Quality of Service Command-Line Interface” section of the <i>Cisco IOS Quality of Service Solutions Configuration Guide</i> , Release 12.2
Additional match criteria that can be used for packet classification	“Configuring the Modular Quality of Service Command-Line Interface” section of the <i>Cisco IOS Quality of Service Solutions Configuration Guide</i> , Release 12.2
Class-based marking	<i>Class-Based Marking</i> , Cisco IOS Release 12.2(2)T feature module
Instructions for configuring CEF	<i>Cisco IOS Switching Services Configuration Guide</i> , Release 12.2
CEF-related commands: complete command syntax, command modes, command history, defaults, usage guidelines, and examples	<i>Cisco IOS Switching Services Command Reference</i> , Release 12.2
MPLS commands: complete command syntax, command modes, command history, defaults, usage guidelines, and examples	<i>Cisco IOS Switching Services Command Reference</i> , Release 12.2
MPLS tunneling modes	<i>MPLS DiffServ Tunneling Modes</i> , Cisco IOS Release 12.2(13)T feature module

## Standards

Standards	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

## MIBs

MIBs	MIBs Link
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	To obtain lists of supported MIBs by platform and Cisco IOS release, and to download MIB modules, go to the Cisco MIB website on Cisco.com at the following URL: <a href="http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml">http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml</a>

To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:

<http://tools.cisco.com/ITDIT/MIBS/servlet/index>

If Cisco MIB Locator does not support the MIB information that you need, you can also obtain a list of supported MIBs and download MIBs from the Cisco MIBs page at the following URL:

<http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>

To access Cisco MIB Locator, you must have an account on Cisco.com. If you have forgotten or lost your account information, send a blank e-mail to [cco-locksmith@cisco.com](mailto:cco-locksmith@cisco.com). An automatic check will verify that your e-mail address is registered with Cisco.com. If the check is successful, account details with a new random password will be e-mailed to you. Qualified users can establish an account on Cisco.com by following the directions found at this URL:

<http://www.cisco.com/register>

## RFCs

RFCs <sup>1</sup>	Title
RFC 2475	<i>An Architecture for Differentiated Services</i>
RFC 2598	<i>An Expedited Forwarding PHB</i>
RFC 2597	<i>Assured Forwarding PHB Group</i>
RFC 2474	<i>Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers</i>
RFC 3270	<i>Multi-Protocol Label Switching (MPLS) Support of Differentiated Services</i>

1. Not all supported RFCs are listed.

## Technical Assistance

Description	Link
Technical Assistance Center (TAC) home page, containing 30,000 pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	<a href="http://www.cisco.com/public/support/tac/home.shtml">http://www.cisco.com/public/support/tac/home.shtml</a>

# Command Reference

This section documents new and modified commands. All other commands used with this feature are documented in the Cisco IOS Release 12.2 command reference publications.

## New Commands

- [set dscp](#)
- [set mpls experimental imposition](#)
- [set mpls experimental topmost](#)
- [set precedence](#)
- [show table-map](#)
- [table-map \(value mapping\)](#)

## Modified Commands

- [set cos](#)
- [set qos-group](#)
- [show policy-map](#)
- [show policy-map interface](#)

## Obsolete and Replaced Commands

Table 2 lists those commands that have been replaced in Cisco IOS Release 12.2(13)T:

**Table 2** *Replaced IOS Commands*

<b>Command in Cisco IOS Release 12.2</b>	<b>Replacement Command in Cisco IOS Release 12.2(13)T</b>
set ip dscp	set dscp
set ip precedence	set precedence

## set cos

To set the Layer 2 class of service (CoS) value of an outgoing packet, use the **set cos** command in policy-map class configuration mode. To remove a specific CoS value setting, use the **no** form of this command.

```
set cos {cos-value | from-field [table table-map-name]}
```

```
no set cos {cos-value | from-field [table table-map-name]}
```

Syntax Description		
	<i>cos-value</i>	Specific IEEE 802.1Q CoS value from 0 to 7.
	<i>from-field</i>	Specific packet-marking category to be used to set the CoS value of the packet. If you are using a table map for mapping and converting packet-marking values, this establishes the “map from” packet-marking category. packet-marking category keywords are as follows: <ul style="list-style-type: none"> <li>• <b>precedence</b></li> <li>• <b>dscp</b></li> </ul>
	<b>table</b>	(Optional) Used in conjunction with the <i>from-field</i> argument. Indicates that the values set in a specified table map will be used to set the CoS value.
	<i>table-map-name</i>	(Optional) Used in conjunction with the <b>table</b> keyword. Name of the table map used to specify the CoS value. The table map name can be a maximum of 64 alphanumeric characters.

**Defaults** Disabled

**Command Modes** Policy-map class configuration

Command History	Release	Modification
	12.1(5)T	This command was introduced.
	12.2(13)T	This command was modified for the Enhanced Packet Marking feature. A mapping table (table map) can now be used to convert and propagate packet-marking values.

**Usage Guidelines** CoS packet marking is supported only in the Cisco Express Forwarding (CEF)-switching path.

The **set cos** command should be used by a router if a user wants to mark a packet that is being sent to a switch. Switches can leverage Layer 2 header information, including a CoS value marking.

The **set cos** command can be used only in service policies that are attached in the output direction of an interface. Packets entering an interface cannot be set with a CoS value.

The **match cos** and **set cos** commands can be used together to allow routers and switches to interoperate and provide QoS based on the CoS markings.

Layer 2 to Layer 3 mapping can be configured by matching on the CoS value because switches already can match and set CoS values. If a packet that needs to be marked to differentiate user-defined QoS services is leaving a router and entering a switch, the router should set the CoS value of the packet because the switch can process the Layer 2 header.

### Using This Command with the Enhanced Packet Marking Feature

If you are using this command as part of the Enhanced Packet Marking feature, you can use this command to specify the “from-field” packet-marking category to be used for mapping and setting the CoS value. The “from-field” packet-marking categories are as follows:

- Precedence
- Differentiated services code point (DSCP)

If you specify a “from-field” category but do not specify the **table** keyword and the applicable *table-map-name* argument, the default action will be to copy the value associated with the “from-field” category as the CoS value. For instance, if you configure the **set cos precedence** command, the precedence value will be copied and used as the CoS value.

You can do the same for the DSCP marking category. That is, you can configure the **set cos dscp** command, and the DSCP value will be copied and used as the CoS value.



#### Note

If you configure the **set cos dscp** command, only the *first three bits* (the class selector bits) of the DSCP field are used.

### Examples

In the following example, the policy map called “policy-cos” is created to use the values defined in a table map called “table-map1”. The table map called “table-map1” was created earlier with the **table-map** (value mapping) command. For more information about the **table-map** (value mapping) command, see the [table-map \(value mapping\)](#) command page.

In this example, the setting of the CoS value is based on the precedence value defined in “table-map1”.

```
Router(config)# policy-map policy-cos
Router(config-pmap)# class class-default
Router(config-pmap-c)# set cos precedence table table-map1
Router(config-pmap-c)# exit
```

The **set cos** command is applied when you create a service policy in QoS policy-map configuration mode. This service policy is not yet attached to an interface. For information on attaching a service policy to an interface, refer to the “Modular Quality of Service Command-Line Interface” section of the *Cisco IOS Quality of Service Solutions Configuration Guide*, Release 12.2.

### Related Commands

Command	Description
<b>match cos</b>	Matches a packet on the basis of Layer 2 CoS marking.
<b>policy-map</b>	Creates or modifies a policy map that can be attached to one or more interfaces to specify a service policy.
<b>service-policy</b>	Attaches a policy map to an input interface or VC, or an output interface or VC, to be used as the service policy for that interface or VC.
<b>set dscp</b>	Marks a packet by setting the Layer 3 DSCP value in the ToS byte.
<b>set precedence</b>	Sets the precedence value in the packet header.

<b>Command</b>	<b>Description</b>
<b>show policy-map</b>	Displays the configuration of all classes for a specified service policy map or all classes for all existing policy maps.
<b>show policy-map class</b>	Displays the configuration for the specified class of the specified policy map.
<b>show policy-map interface</b>	Displays the configuration of all classes configured for all service policies on the specified interface or displays the classes for the service policy for a specific PVC on the interface.
<b>show table-map</b>	Displays the configuration of a specified table map or all table maps.
<b>table-map (value mapping)</b>	Creates and configures a mapping table for mapping and converting one packet-marking value to another.

# set dscp

To mark a packet by setting the differentiated services code point (DSCP) value in the type of service (ToS) byte, use the **set dscp** command in policy-map class configuration mode. To remove a previously set DSCP value, use the **no** form of this command.

```
set dscp {dscp-value \ from-field [table table-map-name]}
```

```
no set dscp {dscp-value \ from-field [table table-map-name]}
```

## Syntax Description

<i>dscp-value</i>	A number from 0 to 63 that sets the DSCP value. The following reserved keywords can be specified instead of numeric values: <ul style="list-style-type: none"> <li>• <b>EF</b> (expedited forwarding)</li> <li>• <b>AF11</b> (assured forwarding class AF11)</li> <li>• <b>AF12</b> (assured forwarding class AF12)</li> </ul>
<i>from-field</i>	Specific packet-marking category to be used to set the DSCP value of the packet. If you are using a table map for mapping and converting packet-marking values, this establishes the “map from” packet-marking category. Packet-marking category keywords are as follows: <ul style="list-style-type: none"> <li>• <b>cos</b></li> <li>• <b>qos-group</b></li> </ul>
<b>table</b>	(Optional) Used in conjunction with the <i>from-field</i> argument. Indicates that the values set in a specified table map will be used to set the DSCP value.
<i>table-map-name</i>	(Optional) Used in conjunction with the <b>table</b> keyword. Name of the table map used to specify the DSCP value. The name can be a maximum of 64 alphanumeric characters.

## Defaults

No default behavior or values

## Command Modes

Policy-map class configuration

## Command History

Release	Modification
12.2(13)T	This command was introduced. This command replaces the <b>set ip dscp</b> command.

## Usage Guidelines

Once the DSCP bit is set, other quality of service (QoS) features can then operate on the bit settings.

The **set dscp** command cannot be used with the **set precedence** command to mark the *same* packet. The two values, DSCP and precedence, are mutually exclusive. A packet can have one value or the other, but not both.

The network gives priority (or some type of expedited handling) to marked traffic. Typically, you set the precedence value at the edge of the network (or administrative domain); data then is queued according to the precedence. Weighted fair queueing (WFQ) can speed up handling for high-precedence traffic at congestion points. Weighted Random Early Detection (WRED) ensures that high-precedence traffic has lower loss rates than other traffic during times of congestion.

The value of the *dscp-value* argument can be specified by the reserved keywords **EF**, **AF11**, and **AF12** instead of numeric values.

### Using This Command with the Enhanced Packet Marking Feature

If you are using this command as part of the Enhanced Packet Marking feature, you can use this command to specify the “from-field” packet-marking category to be used for mapping and setting the DSCP value. The “from-field” packet-marking categories are as follows:

- Class of service (CoS)
- QoS group

If you specify a “from-field” category but do not specify the **table** keyword and the applicable *table-map-name* argument, the default action will be to copy the value associated with the “from-field” category as the DSCP value. For instance, if you configure the **set dscp cos** command, the CoS value will be copied and used as the DSCP value.



#### Note

The CoS field is a three-bit field, and the DSCP field is a six-bit field. If you configure the **set dscp cos** command, only the three bits of the CoS field will be used.

If you configure the **set dscp qos-group** command, the QoS group value will be copied and used as the DSCP value.

The valid value range for the DSCP is a number from 0 to 63. The valid value range for the QoS group is a number from 0 to 99. Therefore, when configuring the **set dscp qos-group** command, note the following points:

- If a QoS group value falls within both value ranges (for example, 44), the packet-marking value will be copied and the packets will be marked.
- If QoS group value exceeds the DSCP range (for example, 77), the packet-marking value will not be copied and the packet will not be marked. No action is taken.

### Examples

In the following example, the policy map called “policy1” is created to use the packet-marking values defined in a table map called “table-map1”. The table map was created earlier with the **table-map** (value mapping) command. For more information about the **table-map** (value mapping) command, see the [table-map \(value mapping\)](#) command page.

In this example, the DSCP value will be set according to the CoS value defined in the table map called “table-map1”.

```
Router(config)# policy-map policy1
Router(config-pmap)# class class-default
Router(config-pmap-c)# set dscp cos table table-map1
Router(config-pmap-c)# exit
```

The **set dscp** command is applied when you create a service policy in QoS policy-map configuration mode. This service policy is not yet attached to an interface. For information on attaching a service policy to an interface, refer to the “Modular Quality of Service Command-Line Interface” section of the *Cisco IOS Quality of Service Solutions Configuration Guide*, Release 12.2.

Related Commands	Command	Description
	<b>policy-map</b>	Creates or modifies a policy map that can be attached to one or more interfaces to specify a service policy.
	<b>service-policy</b>	Attaches a policy map to an input interface or VC, or an output interface or VC, to be used as the service policy for that interface or VC.
	<b>set cos</b>	Sets the Layer 2 CoS value of an outgoing packet.
	<b>set precedence</b>	Sets the precedence value in the packet header.
	<b>show policy-map</b>	Displays the configuration of all classes for a specified service policy map or all classes for all existing policy maps.
	<b>show policy-map class</b>	Displays the configuration for the specified class of the specified policy map.
	<b>show policy-map interface</b>	Displays the configuration of all classes configured for all service policies on the specified interface or displays the classes for the service policy for a specific PVC on the interface.
	<b>show table-map</b>	Displays the configuration of a specified table map or all table maps.
	<b>table-map (value mapping)</b>	Creates and configures a mapping table for mapping and converting one packet-marking value to another.

# set mpls experimental imposition

To set the value of the Multiprotocol Label Switching (MPLS) experimental (EXP) field on all imposed label entries, use the **set mpls experimental** command in policy-map class configuration mode. To disable the setting, use the **no** form of this command.

```
set mpls experimental imposition {mpls-exp-value | from-field [table table-map-name]}
```

```
no set mpls experimental imposition {mpls-exp-value | from-field [table table-map-name]}
```

Syntax Description		
	<i>mpls-exp-value</i>	Specifies the value used to set MPLS EXP bits defined by the policy map. Valid values are numbers from 0 to 7.
	<i>from-field</i>	Specific packet-marking category to be used to set the MPLS EXP imposition value. If you are using a table map for mapping and converting packet-marking values, this establishes the “map from” packet-marking category. Packet-marking category keywords are as follows: <ul style="list-style-type: none"> <li>• <b>precedence</b></li> <li>• <b>dscp</b></li> </ul>
	<b>table</b>	(Optional) Used in conjunction with the <i>from-field</i> argument. Indicates that the values set in a specified table map will be used to set the MPLS EXP imposition value.
	<i>table-map-name</i>	(Optional) Used in conjunction with the <b>table</b> keyword. Name of the table map used to specify the MPLS EXP imposition value. The name can be a maximum of 64 alphanumeric characters.

**Defaults** No default behavior or values

**Command Modes** Policy-map class configuration

Command History	Release	Modification
	12.2(13)T	This command replaces (renames) the <b>set mpls experimental</b> command, introduced in 12.1(5)T. The <b>set mpls experimental imposition</b> command was modified for the Enhanced Packet Marking feature. A mapping table (table map) can now be used to convert and propagate packet-marking values.

**Usage Guidelines** The **set mpls experimental imposition** command is supported only on input interfaces. Use this command during label imposition. This command sets the MPLS EXP field on all imposed label entries.

### Using This Command with the Enhanced Packet Marking Feature

If you are using this command as part of the Enhanced Packet Marking feature, you can use this command to specify the “from-field” packet-marking category to be used for mapping and setting the class of service (CoS) value. The “from-field” packet-marking categories are as follows:

- Precedence
- Differentiated services code point (DSCP)

If you specify a “from-field” category but do not specify the **table** keyword and the applicable *table-map-name* argument, the default action will be to copy the value associated with the “from-field” category as the MPLS EXP imposition value. For instance, if you configure the **set mpls experimental imposition precedence** command, the precedence value will be copied and used as the MPLS EXP imposition value.

You can configure the **set mpls experimental imposition dscp** command, and the DSCP value will be copied and used as the MPLS EXP imposition value.



#### Note

If you configure the **set mpls experimental imposition dscp** command, only the *first three bits* (the class selector bits) of the DSCP field are used.

### Examples

In the following example, the MPLS EXP value is set to 3 on all imposed label entries:

```
Router(config-pmap) # set mpls experimental imposition 3
```

In the following example, the policy map called “policy1” is created to use the packet-marking values defined in a table map called “table-map1”. The table map was created earlier with the **table-map** (value mapping) command. For more information about the **table-map** (value mapping) command, see the [table-map \(value mapping\)](#) command page.

In this example, the MPLS EXP imposition value will be set according to the DSCP value defined in “table-map1”.

```
Router(config) # policy-map policy1
Router(config-pmap) # class class-default
Router(config-pmap-c) # set mpls experimental imposition dscp table table-map1
Router(config-pmap-c) # exit
```

### Related Commands

Command	Description
<b>set dscp</b>	Marks a packet by setting the Layer 3 DSCP value in the ToS byte.
<b>set mpls experimental topmost</b>	Sets the MPLS EXP field value in the topmost label on either an input or an output interface.
<b>set precedence</b>	Sets the precedence value in the packet header.
<b>show table-map</b>	Displays the configuration of a specified table map or all table maps.
<b>table-map (value mapping)</b>	Creates and configures a mapping table for mapping and converting one packet-marking value to another.

# set mpls experimental topmost

To set the Multiprotocol Label Switching (MPLS) experimental (EXP) field value in the topmost label on either an input or an output interface, use the **set mpls experimental topmost** command in policy-map class configuration mode. To disable the setting, use the **no** form of this command.

```
set mpls experimental topmost {mpls-exp-value | from-field [table table-map-name]}
```

```
no set mpls experimental topmost {mpls-exp-value | from-field [table table-map-name]}
```

Syntax Description		
<i>mpls-exp-value</i>		Specifies the value used to set MPLS experimental bits defined by the policy map. Valid values are numbers from 0 to 7.
<i>from-field</i>		Specific packet-marking category to be used to set the MPLS EXP imposition value. If you are using a table map for mapping and converting packet-marking values, this establishes the “map from” packet-marking category. Packet-marking category keywords are as follows: <ul style="list-style-type: none"> <li>• <b>qos-group</b></li> </ul>
<b>table</b>		(Optional) Used in conjunction with the <i>from-field</i> argument. Indicates that the values set in a specified table map will be used to set the MPLS EXP value.
<i>table-map-name</i>		(Optional) Used in conjunction with the <b>table</b> keyword. Name of the table map used to specify the MPLS EXP value. The name can be a maximum of 64 alphanumeric characters.

**Defaults** No default behavior or values

**Command Modes** Policy-map class configuration

Command History	Release	Modification
	12.2(13)T	This command was introduced.

**Usage Guidelines** This command sets the MPLS EXP value only in the topmost label. This command does not affect an IP packet.

### Using This Command with the Enhanced Packet Marking Feature

If you are using this command as part of the Enhanced Packet Marking feature, you can use this command to specify the “from-field” packet-marking category to be used for mapping and setting the differentiated services code point (DSCP) value. The “from-field” packet-marking categories are as follows:

- QoS group

If you specify a “from-field” category but do not specify the **table** keyword and the applicable *table-map-name* argument, the default action will be to copy the value associated with the “from-field” category as the MPLS EXP topmost value. For instance, if you configure the **set mpls experimental topmost qos-group** command, the QoS group value will be copied and used as the MPLS EXP topmost value.

The valid value range for the MPLS EXP topmost value is a number from 0 to 7. The valid value range for the QoS group is a number from 0 to 99. Therefore, when configuring the **set mpls exp topmost qos-group** command, note the following points:

- If a QoS group value falls within both value ranges (for example, 6), the packet-marking value will be copied and the packets will be marked.
- If QoS group value exceeds the MPLS EXP topmost range (for example, 10), the packet-marking value will not be copied and the packet will not be marked. No action is taken.

---

## Examples

In the following example the MPLS EXP value is set to 3 in the topmost label of an input or output interface:

```
Router(config-pmap)# set mpls experimental topmost 3
```

In the following example, the policy map called “policy1” is created to use the packet-marking values defined in a table map called “table-map1”. The table map was created earlier with the **table-map** (value mapping) command. For more information about the **table-map** (value mapping) command, see the [table-map \(value mapping\)](#) command page.

In this example, the MPLS EXP value will be set according to the QoS group value defined in “table-map1”.

```
Router(config)# policy-map policy1
Router(config-pmap)# class class-default
Router(config-pmap-c)# set mpls experimental topmost qos-group table table-map1
Router(config-pmap-c)# exit
```

---

## Related Commands

Command	Description
<b>match mpls experimental topmost</b>	Matches the MPLS EXP field value in the topmost label.
<b>set mpls experimental imposition</b>	Sets the value of the MPLS EXP field on all imposed label entries.
<b>set qos-group</b>	Sets a group ID that can be used later to classify packets.
<b>show table-map</b>	Displays the configuration of a specified table map or all table maps.
<b>table-map (value mapping)</b>	Creates and configures a mapping table for mapping and converting one packet-marking value to another.

# set precedence

To set the precedence value in the packet header, use the **set precedence** command in policy-map class configuration mode. To remove the precedence value, use the **no** form of this command.

```
set precedence {precedence-value \ from-field [table table-map-name]}
```

```
no set precedence {precedence-value \ from-field [table table-map-name]}
```

Syntax Description		
<i>precedence-value</i>		A number from 0 to 7 that sets the precedence bit in the packet header.
<i>from-field</i>		Specific packet-marking category to be used to set the precedence value of the packet. If you are using a table map for mapping and converting packet-marking values, this establishes the “map from” packet-marking category. Packet-marking category keywords are as follows: <ul style="list-style-type: none"> <li>• <b>cos</b></li> <li>• <b>qos-group</b></li> </ul>
<b>table</b>		(Optional) Used in conjunction with the <i>from-field</i> argument. Indicates that the values set in a specified table map will be used to set the precedence value.
<i>table-map-name</i>		(Optional) Used in conjunction with the <b>table</b> keyword. Name of the table map used to specify a precedence value based on the class of service (CoS) value. The name can be a maximum of 64 alphanumeric characters.

**Defaults** Disabled

**Command Modes** Policy-map class configuration

Command History	Release	Modification
	12.2(13)T	This command was introduced. This command replaces the <b>set ip precedence</b> command.

**Usage Guidelines** Once the precedence bits are set, other quality of service (QoS) features such as weighted fair queuing (WFQ) and Weighted Random Early Detection (WRED) then operate on the bit settings.

The network gives priority (or some type of expedited handling) to marked traffic through the application of WFQ or WRED at points downstream in the network. Typically, you set the precedence value at the edge of the network (or administrative domain); data then is queued according to the specified precedence. WFQ can speed up handling for certain precedence traffic at congestion points. WRED can ensure that certain precedence traffic has lower loss rates than other traffic during times of congestion.

The **set precedence** command cannot be used with the **set dscp** command to mark the *same* packet. The two values, DSCP and precedence, are mutually exclusive. A packet can have one value or the other, but not both.

### Using This Command with the Enhanced Packet Marking Feature

If you are using this command as part of the Enhanced Packet Marking feature, you can use this command to specify the “from-field” packet-marking category to be used for mapping and setting the precedence value. The “from-field” packet-marking categories are as follows:

- Class of service (CoS)
- QoS group

If you specify a “from-field” category but do not specify the **table** keyword and the applicable *table-map-name* argument, the default action will be to copy the value associated with the “from-field” category as the precedence value. For instance, if you configure the **set precedence cos** command, the CoS value will be copied and used as the precedence value.

You can do the same for the QoS group-marking category. That is, you can configure the **set precedence qos-group** command, and the QoS group value will be copied and used as the precedence value.

The valid value range for the precedence value is a number from 0 to 7. The valid value range for the QoS group is a number from 0 to 99. Therefore, when configuring the **set precedence qos-group** command, note the following points:

- If a QoS group value falls within both value ranges (for example, 6), the packet-marking value will be copied and the packets will be marked.
- If QoS group value exceeds the precedence range (for example, 10), the packet-marking value will not be copied, and the packet will not be marked. No action is taken.

### Examples

In the following example, the policy map called “policy-cos” is created to use the values defined in a table map called “table-map1”. The table map called “table-map-1” was created earlier with the **table-map** (value mapping) command. For more information about the **table-map** (value mapping) command, see the [table-map \(value mapping\)](#) command page.

In this example, the precedence value will be set according to the CoS value defined in “table-map1”.

```
Router(config)# policy-map policy-cos
Router(config-pmap)# class class-default
Router(config-pmap-c)# set precedence cos table table-map1
Router(config-pmap-c)# exit
```

The **set precedence** command is applied when you create a service policy in QoS policy-map configuration mode. This service policy is not yet attached to an interface or to an ATM virtual circuit. For information on attaching a service policy to an interface, refer to the “Modular Quality of Service Command-Line Interface” section of the *Cisco IOS Quality of Service Solutions Configuration Guide*, Release 12.2.

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>policy-map</b>	Creates or modifies a policy map that can be attached to one or more interfaces to specify a service policy.
<b>service-policy</b>	Attaches a policy map to an input interface or VC, or an output interface or VC, to be used as the service policy for that interface or VC.
<b>set cos</b>	Sets the Layer 2 CoS value of an outgoing packet.
<b>set dscp</b>	Marks a packet by setting the Layer 3 DSCP value in the ToS byte.
<b>set qos-group</b>	Sets a group ID that can be used later to classify packets.
<b>show policy-map</b>	Displays the configuration of all classes for a specified service policy map or all classes for all existing policy maps.
<b>show policy-map interface</b>	Displays the configuration for all classes configured for all service policies on the specified interface or displays the classes for the service policy for a specific PVC on the interface.
<b>show table-map</b>	Displays the configuration of a specified table map or all table maps.
<b>table-map (value mapping)</b>	Creates and configures a mapping table for mapping and converting one packet-marking value to another.

## set qos-group

To set a group ID that can be used later to classify packets, use the **set qos-group** command in policy-map class configuration mode. To remove the group ID (or value), use the **no** form of this command.

```
set qos-group {group-id | from-field [table table-map-name]}
```

```
no set qos-group {group-id | from-field [table table-map-name]}
```

### Syntax Description

<i>group-id</i>	Group ID number in the range from 0 to 99.
<i>from-field</i>	Specific packet-marking category to be used to set the QoS group value of the packet. If you are using a table map for mapping and converting packet-marking values, this establishes the “map from” packet-marking category. Packet-marking category keywords are as follows: <ul style="list-style-type: none"> <li>• <b>precedence</b></li> <li>• <b>dscp</b></li> <li>• <b>mpls exp topmost</b></li> </ul>
<b>table</b>	(Optional) Used in conjunction with the <i>from-field</i> argument. Indicates that the values set in a specified table map will be used to set the QoS group value.
<i>table-map-name</i>	(Optional) Used in conjunction with the <b>table</b> keyword. Name of the table map used to specify the QoS group value.

### Defaults

This command is disabled by default. No group ID (or value) is specified.

### Command Modes

Policy-map class configuration

### Command History

Release	Modification
11.1 CC	This command was introduced.
12.0(5)XE	This command was integrated into Cisco IOS Release 12.0(5)XE. This command was included in the Modular Quality of Service Command-Line Interface (MQC) feature.
12.2(13)T	This command was modified for the Enhanced Packet Marking feature. A mapping table (table map) can now be used to convert and propagate packet-marking values.

### Usage Guidelines

This command allows you to associate a group value with a packet. The group value can be used later to classify packets into quality of service (QoS) groups by prefix, autonomous system, and community string.

To display QoS group information, use the **show ip cef** command.

### Using This Command with the Enhanced Packet Marking Feature

If you are using this command as part of the Enhanced Packet Marking feature, you can use this command to specify the “from-field” packet-marking category to be used for mapping and setting the precedence value. The “from-field” packet-marking categories are as follows:

- Precedence
- Differentiated services code point (DSCP)
- Multiprotocol Label Switching (MPLS) Experimental (EXP) topmost

If you specify a “from-field” category but do not specify the **table** keyword and the applicable *table-map-name* argument, the default action will be to copy the value associated with the “from-field” category as the precedence value. For instance, if you configure the **set qos-group precedence** command, the precedence value will be copied and used as the QoS group value.

### Examples

The following example sets the QoS group to 1 for all packets that match the class map called “class1”. These packets are then rate-limited on the basis of the QoS group value.

```
Router(config)# policy-map policy1
Router(config-pmap)# class class1
Router(config-pmap-c)# set qos-group 1
```

The following example sets the QoS group value based on the values defined in a table map called “table-map1.” This table map is configured in a policy map called “policy1”. Policy map “policy1” converts and propagates the QoS value according to the values defined in “table-map1”.

In this example, the QoS group value will be set according to the precedence value defined in “table-map1”.

```
Router(config)# policy map policy1
Router(config-pmap)# class class-default
Router(config-pmap-c)# set qos-group precedence table table-map1
Router(config-pmap-c)# exit
```

The **set qos-group** command is applied when you create a service policy in QoS policy-map configuration mode. This service policy is not yet attached to an interface or an ATM virtual circuit. For information on attaching a service policy to an interface, refer to the “Modular Quality of Service Command-Line Interface” section of the *Cisco IOS Quality of Service Solutions Configuration Guide*, Release 12.2.

Related Commands	Command	Description
	<b>policy-map</b>	Creates or modifies a policy map that can be attached to one or more interfaces to specify a service policy.
	<b>service-policy</b>	Attaches a policy map to an input interface or VC, or an output interface or VC, to be used as the service policy for that interface or VC.
	<b>set dscp</b>	Marks a packet by setting the Layer 3 DSCP value in the ToS byte.
	<b>set mpls experimental topmost</b>	Sets the MPLS EXP field value in the topmost label on either an input or an output interface.
	<b>set precedence</b>	Sets the precedence value in the packet header.
	<b>show policy-map</b>	Displays the configuration of all classes for a specified service policy map or all classes for all existing policy maps.
	<b>show policy-map interface</b>	Displays the configuration of all classes configured for all service policies on the specified interface or displays the classes for the service policy for a specific PVC on the interface.
	<b>show table-map</b>	Displays the configuration of a specified table map or all table maps.
	<b>table-map (value mapping)</b>	Creates and configures a mapping table for mapping and converting one packet-marking value to another.

# show policy-map

To display the configuration of all classes for a specified service policy map or all classes for all existing policy maps, use the **show policy-map** command in EXEC mode.

```
show policy-map [policy-map]
```

<b>Syntax Description</b>	<i>policy-map</i>	(Optional) Name of the service policy map whose complete configuration is to be displayed.
---------------------------	-------------------	--

**Defaults** All existing policy map configurations are displayed.

**Command Modes** EXEC

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.0(5)T	This command was introduced.
	12.0(5)XE	This command was incorporated into Cisco IOS Release 12.0(5)XE.
	12.0(7)S	This command was incorporated into Cisco IOS Release 12.0(7)S.
	12.1(1)E	This command was incorporated into Cisco IOS Release 12.1(1)E.
	12.2(4)T	This command was modified for the Two-Rate Policer. It now can display burst parameters and associated actions.
	12.2(8)T	The command was modified for the Policer Enhancement — Multiple Actions feature. This command now displays the multiple actions configured for packets marked as conforming to, exceeding, or violating a specific rate.
	12.2(13)T	This command was modified for the Enhanced Packet Marking feature. A mapping table (table map) can now be used to convert and propagate packet-marking values.

**Usage Guidelines** The **show policy-map** command displays the configuration of a service policy map created using the **policy-map** command. You can use the **show policy-map** command to display all class configurations that make up any existing service policy map, whether or not that service policy map has been attached to an interface.

**Examples** The following sample output of the **show policy-map** command displays the configuration for policy maps called “policy1” and “policy2”.

In “policy1”, a table map called “table-map-cos1” has been configured to determine the precedence based on the class of service (CoS) value. Policy map “policy 1” converts and propagates the packet markings defined in the table map called “table-map-cos1”.

The following sample output of the **show policy-map** command displays the configuration for service polices called “policy1” and “policy2”. In “policy1”, a table map called “table-map1” has been configured to determine the precedence according to the CoS value. In “policy2”, a table map called “table-map2” has been configured to determine the CoS value according to the precedence value.

```
Router# show policy-map policy1

Policy Map policy1
  Class class-default
    set precedence cos table table-map1

Router# show policy-map policy2

Policy Map policy2
  Class class-default
    set cos precedence table table-map2
```

Table 3 describes the fields shown in the display.

**Table 3** show policy-map Field Descriptions

Field	Description
Policy Map	Name of the policy map being displayed.
Class	Name of the class in the policy map being displayed.
set precedence table table-map-cos1 or set cos table table-map-cos2	Name of the set command used to set the specified value.  For instance, set precedence table table-map1 indicates that a table map called table-map1 has been configured to set the Precedence value based on the values defined in the table map.  Alternately, set cos table table-map2 indicates that a table map called table-map2 has been configured to set the CoS value based on the values defined in the table map.

#### Related Commands

Command	Description
<b>policy-map</b>	Creates or modifies a policy map that can be attached to one or more interfaces to specify a service policy.
<b>show policy-map class</b>	Displays the configuration for the specified class of the specified policy map.
<b>show policy-map interface</b>	Displays the configuration of all classes configured for all service policies on the specified interface or displays the classes for the service policy for a specific PVC on the interface.
<b>show table-map</b>	Displays the configuration of a specified table map or all table maps.
<b>table-map (value mapping)</b>	Creates and configures a mapping table for mapping and converting one packet-marking value to another.

# show policy-map interface

To display the packet statistics of all classes that are configured for all service policies either on the specified interface or subinterface or on a specific permanent virtual circuit (PVC) on the interface, use the **show policy-map interface** command in EXEC mode.

**show policy-map interface** *interface-name* [**vc** [*vpi/* *vci*]][**dlci** *dlci*] [**input** | **output**]

Syntax	Description
<i>interface-name</i>	Name of the interface or subinterface whose policy configuration is to be displayed.
<b>vc</b>	(Optional) For ATM interfaces only, shows the policy configuration for a specified PVC. The name can be up to 16 characters long.
<i>vpi/</i>	(Optional) ATM network virtual path identifier (VPI) for this PVC. On the Cisco 7200 and 7500 series routers, this value ranges from 0 to 255.  The <i>vpi</i> and <i>vci</i> arguments cannot both be set to 0; if one is 0, the other cannot be 0.
<i>vci</i>	(Optional) ATM network virtual channel identifier (VCI) for this PVC. This value ranges from 0 to 1 less than the maximum value set for this interface by the <b>atm vc-per-vc</b> command. Typically, the lower values 0 to 31 are reserved for specific traffic (F4 Operation, Administration, and Maintenance (OAM), switched virtual circuit (SVC) signaling, Integrated Local Management Interface (ILMI), and so on) and should not be used.  The VCI is a 16-bit field in the header of the ATM cell. The VCI value is unique only on a single link, not throughout the ATM network, because it has local significance only.  The <i>vpi</i> and <i>vci</i> arguments cannot both be set to 0; if one is 0, the other cannot be 0.
<b>dlci</b>	(Optional) Indicates a specific PVC for which policy configuration will be displayed.
<i>dlci</i>	(Optional) A specific data-link connection identifier (DLCI) number used on the interface. Policy configuration for the corresponding PVC will be displayed when a DLCI is specified.
<b>input</b>	(Optional) Indicates that the statistics for the attached input policy will be displayed.
<b>output</b>	(Optional) Indicates that the statistics for the attached output policy will be displayed.

## Defaults

The absence of both the forward slash (/) and a *vpi* value causes the *vpi* value to default to 0. If this value is omitted, information for all virtual circuits (VCs) on the specified ATM interface or subinterface is displayed.

## Command Modes

EXEC

Command History	Release	Modification
	12.0(5)T	This command was introduced.
	12.0(5)XE	This command was integrated into Cisco IOS Release 12.0(5)XE.
	12.0(7)S	This command was integrated into Cisco IOS Release 12.0(7)S.
	12.1(1)E	This command was integrated into Cisco IOS Release 12.1(1)E.
	12.1(2)T	This command was integrated into Cisco IOS Release 12.1(2)T. This command was modified to display information about the policy for all Frame Relay PVCs on the interface, or, if a DLCI is specified, the policy for that specific PVC. This command was also modified to display the total number of the packets marked by the QoS set action.
	12.1(3)T	This command was integrated into Cisco IOS Release 12.1(3)T. This command was modified to display per-class accounting statistics.
	12.2(4)T	This command was modified for the Two-Rate Policer. It now can display burst parameters and associated actions.
	12.2(8)T	The command was modified for the Policer Enhancement — Multiple Actions feature. This command now displays the multiple actions configured for packets conforming to, exceeding, or violating a specific rate.
	12.2(13)T	This command was modified for the Enhanced Packet Marking feature. A mapping table (table map) can now be used to convert and propagate packet-marking values.

### Usage Guidelines

The **show policy-map interface** command displays the configuration for classes on the specified interface or the specified PVC only if a service policy has been attached to the interface or the PVC.

### Examples

The following sample output of the **show policy-map interface** command shows the service policies attached to a FastEthernet subinterface. In this example, a service policy called “policy1” has been attached. In “policy1”, a table map called “table-map1” has been configured. The values in “table-map1” will be used to map the precedence values to the corresponding class of service (CoS) values.

```
Router# show policy-map interface

FastEthernet1/0.1

Service-policy input: policy1

Class-map: class-default (match-any)
  0 packets, 0 bytes
  5 minute offered rate 0 bps, drop rate 0 bps
Match: any
QoS Set
  precedence cos table table-map1
  Packets marked 0
```

Table 4 describes the significant fields shown in the display.

**Table 4** show policy-map interface Field Descriptions<sup>1</sup>

Field	Description
Service-policy input	Name of the input service policy applied to the specified interface or VC.
Class-map	Class of traffic being displayed. Output is displayed for each configured class in the policy. The choice for implementing class matches (for example, match-all or match-any) can also appear next to the traffic class.
packets, bytes	Number of the packets (also shown in bytes) identified as belonging to the class of traffic being displayed.
offered rate	Rate, in kbps, of the packets coming into the class.
Match	Match criteria specified for the class of traffic. Choices include criteria such as Precedence, IP differentiated services code point (DSCP) value, Multiprotocol Label Switching (MPLS) experimental value, access groups, and quality of service (QoS) group (set). For more information about the variety of match criteria options that are available, refer to the “Configuring the Modular Quality of Service Command-Line Interface” section in the <i>Cisco IOS Quality of Service Solutions Configuration Guide</i> , Release 12.2.
QoS Set	Indicates that QoS group (set) has been configured for the particular class.
precedence cos table table-map1	Indicates that a table map (called “table-map1”) has been used to determine the precedence value. The precedence value will be set according to the CoS value defined in the table map.
Packets marked	Total number of packets marked for the particular class.

1. A number in parentheses may appear next to the service-policy input name and the class-map name. The number is for Cisco internal use only and can be disregarded.

**Related Commands**

Command	Description
<b>policy-map</b>	Creates or modifies a policy map that can be attached to one or more interfaces to specify a service policy.
<b>show policy-map</b>	Displays the configuration of all classes for a specified service policy map or all classes for all existing policy maps.
<b>show policy-map class</b>	Displays the configuration for the specified class of the specified policy map.
<b>show table-map</b>	Displays the configuration of a specified table map or all table maps.
<b>table-map (value mapping)</b>	Creates and configures a mapping table for mapping and converting one packet-marking value to another.

# show table-map

To display the configuration of a specified table map or all table maps, use the **show table-map** command in EXEC mode.

**show table-map** *table-map-name*

Syntax Description	<i>table-map-name</i>	Name of table map used to map one packet-marking value to another. The name can be a maximum of 64 alphanumeric characters.
--------------------	-----------------------	---

**Defaults** All existing table map configurations are displayed.

**Command Modes** EXEC

Command History	Release	Modification
	12.2(13)T	This command was introduced.

**Examples** The sample output of the **show table-map** command shows the contents of a table map called “map 1”. In “map1”, a “to–from” relationship has been established and a default value has been defined. The fields for establishing the “to–from” mappings are further defined by the policy map in which the table map will be configured. (Configuring a policy map is the next logical step after creating a table map.)

For instance, a precedence or differentiated services code point (DSCP) value of 0 could be mapped to a class of service (CoS) value of 1, or vice versa, depending on the how the values are defined in the table map. Any values not explicitly defined in a “to–from” relationship will be set to a default value.

The following sample output of the **show table-map** command displays the contents of a table map called “map1”. In this table map, a packet-marking value of 0 is mapped to a packet-marking value of 1. All other packet-marking values are mapped to the default value 3.

```
Router# show table-map map1

Table Map map1
from 0 to 1
default 3
```

[Table 5](#) describes the fields shown in the display.

**Table 5** *show policy-map interface Field Descriptions*

Field	Description
Table Map	The name of the table map being displayed.
from, to	The values of the “to–from” relationship established by the <b>table-map</b> (value mapping) command and further defined by the policy map in which the table map will be configured.
default	The default action to be used for any values not explicitly defined in a “to–from” relationship by the <b>table-map</b> (value mapping) command. If a default action is not specified in the table-map (value mapping) command, the default action is “copy”.

**Related Commands**

Command	Description
<b>policy-map</b>	Creates or modifies a policy map that can be attached to one or more interfaces to specify a service policy.
<b>show policy-map</b>	Displays the configuration of all classes for a specified service policy map or all classes for all existing policy maps.
<b>show policy-map class</b>	Displays the configuration for the specified class of the specified policy map.
<b>table-map (value mapping)</b>	Creates and configures a mapping table for mapping and converting one packet-marking value to another.

## table-map (value mapping)

To create and configure a mapping table for mapping and converting one packet-marking value to another, use the **table-map** (value mapping) command in global configuration mode. To disable the use of this table map, use the **no** form of the command.

**table-map** *table-map-name* **map from** *from-value* **to** *to-value* [**default** *default-value-or-action*]

**no table-map** *table-map-name* **map from** *from-value* **to** *to-value* [**default** *default-value-or-action*]

### Syntax Description

<i>table-map-name</i>	Name of table map to be created. The name can be a maximum of 64 alphanumeric characters.
<b>map from</b>	Indicates that a “map from” value will be used.
<i>from-value</i>	The “map from” value of the packet-marking category. The value range varies according to the packet-marking category from which you want to map and convert. For more information, see the “Usage Guidelines” section below.
<b>to</b>	Indicates that a “map to” value will be used.
<i>to-value</i>	The “map to” value of the packet-marking category. The value range varies according to the packet-marking category to which you want to map and convert. For more information, see the “Usage Guidelines” section below.
<b>default</b>	(Optional) Indicates that a default value or action will be used.
<i>default-value-or-action</i>	(Optional) The default value or action to be used if a “to–from” relationship has not been explicitly configured. Default actions are “ignore” and “copy”. If neither action is specified, “copy” is used.

### Defaults

The **default** keyword and *default-action-or-value* argument sets the default value (or action) to be used if a value is not explicitly designated.

If you configure a table map but you do not specify a *default-value-or-action* argument for the **default** keyword, the default action is “copy”.

### Command Modes

Global configuration

### Command History

Release	Modification
12.2(13)T	This command was introduced.

### Usage Guidelines

This command allows you to create a mapping table. The mapping table, a type of conversion chart, is used for establishing a “to–from” relationship between packet-marking types or categories. For example, a mapping table can be used to establish a “to–from” relationship between the following packet-marking categories:

- Class of service (CoS)
- Precedence

- Differentiated services code point (DSCP)
- Quality of service (QoS) group
- Multiprotocol Label Switching (MPLS) experimental (EXP) imposition
- MPLS EXP topmost

When configuring the table map, you must specify the packet-marking values to be used in the conversion. The values you can enter vary by packet-marking category.

Table 6 lists the valid value ranges you can enter for each packet-marking category.

**Table 6** Valid Value Ranges

packet-marking Category	Value Ranges
CoS	Specific IEEE 802.1Q number in the range from 0 to 7.
Precedence	Number in the range from 0 to 7
DSCP	Number in the range from 0 to 63.
QoS Group	Number in the range from 0 to 99
MPLS EXP imposition	Number in the range from 0 to 7.
MPLS EXP topmost	Number in the range from 0 to 7.

In the following example, the **table-map** (value mapping) command has been configured to create a table map called “map1”. In “map1”, two “to–from” relationships have been established and a default value has been defined. The fields for establishing the “to–from” mappings are further defined by the policy map in which the table map will be configured. (Configuring a policy map is the next logical step after creating a table map.)

For instance, a precedence or DSCP value of 0 could be mapped to a CoS value of 0, or vice versa, depending on the how the table map is configured. Any values not explicitly defined in a “to–from” relationship will be set to a default value.

```
Router(config)# table-map map1
Router(config-tablemap)# map from 0 to 0
Router(config-tablemap)# map from 2 to 1
Router(config-tablemap)# default 3
Router(config-tablemap)# end
```

#### Related Commands

Command	Description
<b>policy-map</b>	Creates or modifies a policy map that can be attached to one or more interfaces to specify a service policy.
<b>show policy-map</b>	Displays the configuration of all classes for a specified service policy map or all classes for all existing policy maps.
<b>show policy-map class</b>	Displays the configuration for the specified class of the specified policy map.
<b>show policy-map interface</b>	Displays the packet statistics of all classes that are configured for all service policies either on the specified interface or subinterface or on a specific PVC on the interface.
<b>show table-map</b>	Displays the configuration of a specified table map or all table maps.

■ table-map (value mapping)