

# match mpls-label

To redistribute routes that include Multiprotocol Label Switching (MPLS) labels if the routes meet the conditions specified in the route map, use the **match mpls-label** command in route map configuration mode. To disable this function, use the **no** form of this command.

**match mpls-label**

**no match mpls-label**

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

**Defaults** Routes with MPLS labels are not redistributed.

**Command Modes** Route map configuration

## Command History

| Release    | Modification  |
|------------|---|
| 12.0(21)ST | This command was introduced.                                  |
| 12.0(22)S  | This command was integrated into Cisco IOS Release 12.0(22)S. |
| 12.0(23)S  | This command was integrated into Cisco IOS Release 12.0(23)S. |
| 12.2(13)T  | This command was integrated into Cisco IOS Release 12.2(13)T. |

## Usage Guidelines

A route map that includes this command can be used in the following instances:

- With the **neighbor route-map in** command to manage inbound route maps in BGP
- With the **redistribute bgp** command to redistribute route maps in an IGP

Use the **route-map** global configuration command, and the **match** and **set** route map configuration commands, to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the match criteria—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the set actions—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **match route-map** configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must “pass” to cause the route to be redistributed according to the set actions given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

When you are passing routes through a route map, a route map can have several parts. Any route that does not match at least one match clause relating to a **route-map** command will be ignored; that is, the route will not be advertised for outbound route maps and will not be accepted for inbound route maps. If you want to modify only some data, you must configure a second route map section with an explicit match specified.

**Examples**

The following example shows how to create a route map that redistributes routes if the following conditions are met:

- The IP address of the route matches an IP address in ACL 2.
- The route includes an MPLS label.

```
Router(config-router)# route-map incoming permit 10
Router(config-route-map)# match ip address 2
Router(config-route-map)# match mpls-label
```

**Related Commands**

| Command                 | Description  |
|-------------------------|--|
| <b>match ip address</b> | Distributes any routes that have a destination network number address that is permitted by a standard or extended access list. |
| <b>route-map (IP)</b>   | Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.            |
| <b>set mpls-label</b>   | Enables a route to be distributed with an MPLS label if the route matches the conditions specified in the route map.           |

## maximum routes

To limit the maximum number of routes in a Virtual Private Network (VPN) routing/forwarding instance (VRF) to prevent a provider edge (PE) router from importing too many routes, use the **maximum routes** command in VRF configuration submode. To remove the limit on the maximum number of routes allowed, use the **no** form of this command.

**maximum routes** *limit* {*warn-threshold* | **warning-only**}

**no maximum routes**

| Syntax Description |                       |  |
|--------------------|-----------------------|--|
|                    | <i>limit</i>          | Specifies the maximum number of routes allowed in a VRF. The valid range is from 1 to 4,294,967,295 routes.  |
|                    | <i>warn-threshold</i> | The warning threshold value is expressed as a percentage (from 1 to 100) of the <i>limit</i> value. When the number of routes reaches the specified percentage of the limit, a warning message is generated. |
|                    | <b>warning-only</b>   | Issues a syslog error message when the maximum number of routes allowed for a VRF exceeds the threshold. However, additional routes are still allowed.   |

### Defaults

No limit is set on the maximum number of routes allowed.

### Command Modes

VRF configuration

### Command History

| Release   | Modification                              |
|-----------|---|
| 12.0(7)T  | This command was introduced.              |
| 12.2(13)T | Support for SNMP notifications was added. |

### Usage Guidelines

The **maximum routes** command can be configured in one of two ways:

- Generate a warning message when the *limit* is exceeded
- Generate a warning message when the *warn-threshold* is reached

To limit the number of routes allowed in the VRF, use the **maximum routes** *limit* command with the *warn-threshold* argument. The *warn-threshold* argument generates a warning and does not allow the addition of routes to the VRF when the maximum number set by the *limit* argument is reached. The software generates a warning message everytime a route is added to a VRF when the VRF route count is above the warning threshold. The software also generates a route rejection notification when the maximum threshold is reached and everytime a route is rejected after the limit is reached.

To set a number of routes at which you receive a notification, but which does not limit the number of routes that can be imported into the VRF, use the **maximum routes** *limit* command with the **warn-only** keyword.

To configure the router to generate SNMP notifications (traps or informs) for these values use the **snmp-server enable traps mpls vpn** global configuration command.

**Examples**

The following example shows how to set a limit threshold of VRF routes to 1000. When the number of routes for the VRF reaches 1000, the router issues a syslog error message, but continues to accept new VRF routes.

```
Router(config)# ip vrf vrf1

Router(config-vrf)# rd 100:1

Router(config-vrf)# route-target import 100:1

Router(config-vrf)# maximum routes 1000 warning-only
```

The following example shows how to set the maximum number of VRF routes allowed to 1000 and set the warning threshold at 80 percent of the maximum. When the number of routes for the VRF reaches 800, the router issues a warning message. When the number of routes for the VRF reaches 1000, the router issues a SYSLOG error message and rejects any new routes.

```
Router(config)# ip vrf vrf2

Router(config-vrf)# rd 200:1

Router(config-vrf)# route-target import 200:1

Router(config-vrf)# maximum routes 1000 80
```

**Related Commands**

| Command             | Description  |
|---------------------|--|
| <b>import map</b>   | Configures an import route map for a specified VRF for more control over routes imported into the VRF. |
| <b>ip vrf</b>       | Specifies a name for a VRF routing table and enters VRF configuration mode.                            |
| <b>rd</b>           | Creates VRF routing and forwarding tables and specifies the default route distinguisher for a VPN.     |
| <b>route-target</b> | Configures a VRF route target community for importing and exporting extended community attributes.     |

# metric-style narrow

To configure a router running Intermediate System-to-Intermediate System (IS-IS) so that it generates and accepts old-style type, length, and value objects (TLVs), use the **metric-style narrow** command in router configuration mode. To disable this function, use the **no** form of this command.

**metric-style narrow** [**transition**] [**level-1** | **level-2** | **level-1-2**]

**no metric-style narrow** [**transition**] [**level-1** | **level-2** | **level-1-2**]

## Syntax Description

|                   |  |
|-------------------|--|
| <b>transition</b> | (Optional) Instructs the router to use both old- and new-style TLVs. |
| <b>level-1</b>    | (Optional) Enables this command on routing level 1.                  |
| <b>level-2</b>    | (Optional) Enables this command on routing level 2.                  |
| <b>level-1-2</b>  | (Optional) Enables this command on routing levels 1 and 2.           |

## Defaults

The Multiprotocol Label Switching (MPLS) traffic engineering image generates only old-style TLVs. To do MPLS traffic engineering, a router must generate new-style TLVs that have wider metric fields.

## Command Modes

Router configuration

## Command History

| Release  | Modification                 |
|----------|------------------------------|
| 12.0(5)S | This command was introduced. |

## Examples

The following example shows how to configure the router to generate and accept old-style TLVs on router level 1:

```
Router(config-router)# metric-style narrow level-1
```

## Related Commands

| Command                        | Description  |
|--------------------------------|--|
| <b>metric-style transition</b> | Configures a router to generate both old-style and new-style TLVs. |
| <b>metric-style wide</b>       | Configures a router to generate and accept only new-style TLVs.    |

# metric-style transition

To configure a router running Intermediate System-to-Intermediate System (IS-IS) so that it generates and accepts both old-style and new-style type, length, and value objects (TLVs), use the **metric-style transition** command in router configuration mode. To disable this function, use the **no** form of this command.

**metric-style transition** [**level-1** | **level-2** | **level-1-2**]

**no metric-style transition** [**level-1** | **level-2** | **level-1-2**]

| Syntax Description |                  |  |
|--------------------|------------------|--|
|                    | <b>level-1</b>   | (Optional) Enables this command on routing level 1.        |
|                    | <b>level-2</b>   | (Optional) Enables this command on routing level 2.        |
|                    | <b>level-1-2</b> | (Optional) Enables this command on routing levels 1 and 2. |

**Defaults** The Multiprotocol Label Switching (MPLS) traffic engineering image generates only old-style TLVs. To do MPLS traffic engineering, a router must generate new-style TLVs that have wider metric fields.

**Command Modes** Router configuration

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | 12.0(5)S | This command was introduced. |

**Examples** The following example shows how to configure a router to generate and accept both old-style and new-style TLVs on router level 2:

```
Router(config-router)# metric-style transition level-2
```

| Related Commands | Command                    | Description   |
|------------------|----------------------------|---|
|                  | <b>metric-style narrow</b> | Configures a router to generate and accept old-style TLVs.      |
|                  | <b>metric-style wide</b>   | Configures a router to generate and accept only new-style TLVs. |

# metric-style wide

To configure a router running Intermediate System-to-Intermediate System (IS-IS) so that it generates and accepts only new-style type, length, and value objects (TLVs), use the **metric-style wide** command in router configuration mode. To disable this function, use the **no** form of this command.

**metric-style wide** [**transition**] [**level-1** | **level-2** | **level-1-2**]

**no metric-style wide** [**transition**] [**level-1** | **level-2** | **level-1-2**]

## Syntax Description

|                   |   |
|-------------------|---|
| <b>transition</b> | (Optional) Instructs the router to accept both old- and new-style TLVs. |
| <b>level-1</b>    | (Optional) Enables this command on routing level 1.                     |
| <b>level-2</b>    | (Optional) Enables this command on routing level 2.                     |
| <b>level-1-2</b>  | (Optional) Enables this command on routing levels 1 and 2.              |

## Defaults

The Multiprotocol Label Switching (MPLS) traffic engineering image generates only old-style TLVs. To do MPLS traffic engineering, a router must generate new-style TLVs that have wider metric fields.

## Command Modes

Router configuration

## Command History

| Release          | Modification                 |
|------------------|------------------------------|
| Release 12.0(5)S | This command was introduced. |

## Usage Guidelines

If you enter the **metric-style wide** command, a router generates and accepts only new-style TLVs. Therefore, the router uses less memory and other resources than it would if it generated both old-style and new-style TLVs.

This style is appropriate for enabling MPLS traffic engineering across an entire network.



### Note

This discussion of metric styles and transition strategies is oriented toward traffic engineering deployment. Other commands and models could be appropriate if the new-style TLVs are desired for other reasons. For example, a network might require wider metrics, but might not use traffic engineering.

## Examples

The following example shows how to configure a router to generate and accept only new-style TLVs on level 1:

```
Router(config-router)# metric-style wide level-1
```

**Related Commands**

| <b>Command</b>                 | <b>Description</b>  |
|--------------------------------|---|
| <b>metric-style narrow</b>     | Configures a router to generate and accept old-style TLVs.                    |
| <b>metric-style transition</b> | Configures a router to generate and accept both old-style and new-style TLVs. |

## mpls atm control-vc

To configure the control-VC virtual path identifier (VPI) and virtual circuit identifier (VCI) values for the initial link to the Multiprotocol Label Switching (MPLS) peer, use the **mpls atm control-vc** command in interface configuration mode. To unconfigure the values, use the **no** form of this command.

**mpls atm control-vc** *vpi vci*

**no mpls atm control-vc** *vpi vci*

| Syntax Description |            |   |
|--------------------|------------|---|
|                    | <i>vpi</i> | Virtual path identifier, in the range from 0 to 4095.     |
|                    | <i>vci</i> | Virtual circuit identifier, in the range from 0 to 65535. |

| Defaults |      |
|----------|------|
|          | 0/32 |

| Command Modes |                         |
|---------------|-------------------------|
|               | Interface configuration |

| Command History | Release  | Modification   |
|-----------------|----------|--|
|                 | 12.0(5)T | This command was introduced.   |
|                 | 12.2(4)T | This command was updated to reflect the MPLS IETF terminology. The VPI range of values was extended to 4095. |

| Usage Guidelines |   |
|------------------|---|
|                  | Use this command to establish the LDP session and to carry non-IP traffic. The default VPI VCI for the control VC is (3, 32). If for any reason you need to have a different control-VC, use the <b>mpls atm control-vc</b> command to configure any VPI VCI allowed by the <i>vpi</i> and <i>vci</i> arguments for the control VC. |

| Examples |   |
|----------|---|
|          | The following example shows how to create an MPLS subinterface on a router and select VPI 1 and VCI 34 as the control VC: |

```
Router(config)# interface atm4/0.1 mpls
Router(config-if)# mpls ip
Router(config-if)# mpls atm control-vc 1 34
```

| Related Commands | Command                    | Description  |
|------------------|----------------------------|--|
|                  | <b>mpls ip (interface)</b> | Enables label switching of IPv4 packets on an interface. |

# mpls atm cos

To change the configured bandwidth allocation for class of service (CoS), use the **mpls atm cos** command in global configuration mode.

**mpls atm cos {available | standard | premium | control} weight**

## Syntax Description

|                  |  |
|------------------|--|
| <b>available</b> | The weight for the available class. This is the lowest class priority.         |
| <b>standard</b>  | The weight for the standard class. This is the next lowest class priority.     |
| <b>premium</b>   | The weight for the premium class. This is the next highest class priority.     |
| <b>control</b>   | The weight for the control class. This is the highest class priority.          |
| <i>weight</i>    | The total weight for all CoS traffic classes. This value ranges from 0 to 100. |

## Defaults

Available 50%, control 50%

## Command Modes

Global configuration

## Command History

| Release  | Modifications  |
|----------|--|
| 12.0(5)T | This command was introduced.                                   |
| 12.2(4)T | This command was updated to reflect the MPLS IETF terminology. |

## Examples

The following example shows how to configure the XTagATM interface for CoS traffic:

```
Router(config)# interface xtagatm12
Router(config-if)# extended-port atm1/0 descriptor 1.2
Router(config-if)# mpls ip
Router(config-if)# mpls atm cos available 49
Router(config-if)# mpls atm cos standard 50
Router(config-if)# mpls atm cos premium 0
Router(config-if)# mpls atm cos control 1
```

# mpls atm disable-headend-vc

To remove all headend virtual circuits (VCs) from the Multiprotocol Label Switching (MPLS) Label Switch Controller (LSC) and disable its ability to function as an edge label switch router (LSR), use the **mpls atm disable-headend-vc** command in global configuration mode. To restore the headend VCs of the MPLS LSC and restore full edge LSR functionality, use the **no** form of this command.

**mpls atm disable-headend-vc**

**no mpls atm disable-headend-vc**

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

**Defaults** Edge LSR is enabled

**Command Modes** Global configuration

| Command History | Release   | Modification   |
|-----------------|-----------|--|
|                 | 12.0(7)DC | This command was introduced.                                   |
|                 | 12.2(4)T  | This command was updated to reflect the MPLS IETF terminology. |

**Usage Guidelines** This command prevents the LSC from initiating headend label VCs (LVCs), and thus reduces the number of LVCs used in the network.

**Examples** The following example shows how to disable the MPLS LSC from acting like an edge LSR and therefore cannot create headend LVCs:

```
mpls atm disable-headend-vc
```

# mpls atm multi-vc

To configure a router subinterface to create one or more label virtual circuits (VCs) over which packets of different classes are sent, use the **mpls atm multi-vc** command in ATM subinterface submode. To remove the label virtual circuits, use the **no** form of this command.

**mpls atm multi-vc**

**no mpls atm multi-vc**

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

**Command Modes** ATM subinterface submode

| Command History | Release    | Modification   |
|-----------------|------------|--|
|                 | 12.0(5)T   | This command was introduced.   |
|                 | 12.0(10)ST | This command was modified to reflect Multiprotocol Label Switching (MPLS) Internet Engineering Task Force (IETF) syntax and terminology. |
|                 | 12.2(2)T   | This command was integrated into Cisco IOS Release 12.2(2)T.   |

**Usage Guidelines** This command is valid only on ATM MPLS subinterfaces.

**Examples** The following example shows how to configure interface ATM2/0/0.1 on the networking device for MPLS quality of service (QoS) multi-VC mode:

```
Router# configure terminal

Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# interface ATM2/0/0.1 mpls
Router(config-subif)# mpls atm multi-vc
Router(config-subif)# exit
Router(config)# exit
```

| Related Commands | Command                | Description  |
|------------------|------------------------|--|
|                  | <b>mpls cos-map</b>    | Creates a class map that specifies how classes map to label virtual circuits when they are combined with a prefix map.       |
|                  | <b>mpls prefix-map</b> | Configures a networking device to use a specified QoS map when a label destination prefix matches the specified access list. |

# mpls atm vpi

To configure the range of values to use in the virtual path identifier (VPI) field for label virtual circuits (LVCs), use the **mpls atm vpi** command in interface configuration mode. To clear the range of values, use the **no** form of this command.

```
mpls atm vpi vpi [- vpi] [vci-range low - high]
```

```
no mpls atm vpi vpi [- vpi] [vci-range low - high]
```

## Syntax Description

|                                    |  |
|------------------------------------|--|
| <i>vpi</i>                         | Virtual path identifier, low end of range (0 to 4095).   |
| - <i>vpi</i>                       | (Optional) Virtual path identifier, high end of range (0 to 4095).                                   |
| <b>vci-range</b> <i>low - high</i> | (Optional) Range of virtual channel identifier (VCI) values the subinterface can use for the VPI(s). |

## Defaults

The default VPI range is 1-1.

The default VCI range is 33-65535.

## Command Modes

Interface configuration

## Command History

| Release  | Modification   |
|----------|--|
| 12.0(5)T | This command was introduced.   |
| 12.2(4)T | This command was updated to reflect the MPLS IETF terminology. The <b>vci-range</b> keyword was added. The VPI range of values was extended to 4095. |

## Usage Guidelines

You might need to change the default VPI range on the switch if:

- It is an administrative policy to use a VPI value other than 1, the default VPI.
- There are many LVCs on an interface.

To configure ATM MPLS on a router interface (for example, an ATM Interface Processor), you must enable an MPLS subinterface.



### Note

The **mpls atm control-vc** and **mpls atm vpi** subinterface level configuration commands are available on any interface that can support ATM labeling.

Use this command to select an alternate range of VPI values for ATM label assignment on this interface. The two ends of the link negotiate a range defined by the intersection of the range configured at each end.

- To configure the VPI range for an edge label switch router (edge LSR) subinterface connected to another router or to an LSC, limit the range to four VPIs.

- For an ATM-LSR, the VPI range specified must lie within the range that was configured on the ATM switch for the corresponding ATM switch interface.
- If the LDP neighbor is a router, the VPI range can be no larger than two. For example, you can specify from 5 to 6 (a range of two), not 5 to 7 (a range of three). If the LDP neighbor is a switch, the maximum VPI range is 0 to 255.

If you use the **vci-range** keyword, you must specify a VPI value.

## Examples

The following example shows how to create a subinterface and select a VPI range from VPI 1 to VPI 3:

```
Router(config)# interface atm4/0.1 mpls
Router(config-if)# mpls ip
Router(config-if)# mpls atm vpi 1-3
```

The following example shows how to create a subinterface with a VPI of 240 and a VCI range between 33 and 4090:

```
Router(config)# interface atm4/0.1 mpls
Router(config-if)# mpls ip
Router(config-if)# mpls atm vpi 240 vci-range 33-4090
```

## Related Commands

| Command                    | Description   |
|----------------------------|---|
| <b>mpls atm control-vc</b> | Configures VPI and VCI values for the initial link to an MPLS peer. |

# mpls atm vp-tunnel

To specify an interface or a subinterface as a virtual path (VP) tunnel, use the **mpls atm vp-tunnel** command in interface configuration mode. To remove the VP tunnel from an interface or subinterface, use the **no** form of this command.

```
mpls atm vp-tunnel vpi [vci-range low - high]
```

```
no mpls atm vp-tunnel vpi [vci-range low - high]
```

## Syntax Description

|                             |  |
|-----------------------------|--|
| <i>vpi</i>                  | Virtual path identifier (VPI) value for the local end of the tunnel (0 to 4095).   |
| <b>vci-range</b> low - high | (Optional) Range of virtual channel identifier (VCI) values the VP tunnel can use. |

## Defaults

If you do not specify a VCI range for the VP tunnel, the tunnel uses the default VCI range of 33-65535.

## Command Modes

Interface configuration

## Command History

| Release  | Modification   |
|----------|--|
| 12.0(5)T | This command was introduced.   |
| 12.2(4)T | This command was updated to reflect the Multiprotocol Label Switching (MPLS) Internet Engineering Task Force (IETF) terminology. The <b>vci-range</b> keyword was added. The VPI range of values was extended to 4095. |

## Usage Guidelines

The **mpls atm vp-tunnel** and **mpls atm vpi** commands are mutually exclusive.

This command is available on both extended MPLS ATM (XTagATM) interfaces and on LC-ATM subinterfaces of router ATM interfaces. The command is not available on the LS1010, where all subinterfaces are automatically VP tunnels.

It is not necessary to use the **mpls atm vp-tunnel** command on an XTagATM interface in most applications. The switch learns (through VSI interface discovery) whether the XTagATM interface is a tunnel, the VPI value of the tunnel, and tunnel status.

## Examples

The following example shows how to create an MPLS subinterface VP tunnel with a VPI value of 4:

```
Router(config-if)# mpls atm vp-tunnel 4
```

The following example shows how to create a VP tunnel with a value of 240 and a VCI range of 33 to 4090:

```
Router(config-if)# mpls atm vp-tunnel 240 vci-range 33-4090
```

# mpls experimental

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

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

**mpls experimental** [*other* | *range*]

**no mpls experimental**

## Syntax Description

|              |  |
|--------------|--|
| <b>other</b> | (Optional) Specifies any MPLS EXP levels in the range from 0 to 7 that are not explicitly configured. This is the default.   |
| <i>range</i> | (Optional) A single MPLS EXP level specified as a number from 0 to 7, or a range of levels, specified as a hyphenated range. |

## Defaults

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

## Command Modes

VC-class configuration (for a VC class)  
Bundle-VC configuration (for ATM VC bundle members)

## Command History

| Release   | Modification  |
|-----------|---|
| 12.2(8)T  | This command was introduced.                                  |
| 12.0(29)S | This command was integrated into Cisco IOS Release 12.0(29)S. |

## Usage Guidelines

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

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

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

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

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


**Note**

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

**Examples**

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

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

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

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

**Related Commands**

| Command             | Description  |
|---------------------|--|
| <b>bump</b>         | Configures the bumping rules for a VC class that can be assigned to a VC bundle.   |
| <b>bundle</b>       | Creates a bundle or modifies an existing bundle, and enters bundle configuration mode.   |
| <b>class-vc</b>     | Assigns a VC class to an ATM PVC, SVC, or VC bundle member.  |
| <b>protect</b>      | Configures a VC class with protected group or protected VC status for application to a VC bundle member.   |
| <b>pvc-bundle</b>   | Adds a VC to a bundle as a member and enters bundle-VC configuration mode to configure that VC bundle member.  |
| <b>ubr</b>          | Configures UBR QoS and specifies the output peak cell rate for an ATM PVC, SVC, VC class, or VC bundle member.   |
| <b>vbr-nrt</b>      | Configures the VBR-nrt QoS and specifies the output peak cell rate, output sustainable cell rate, and output maximum burst cell size for an ATM PVC, SVC, VC class, or VC bundle member. |
| <b>vc-class atm</b> | Creates a VC class for an ATM PVC, SVC, or ATM interface, and enters VC-class configuration mode.  |

# mpls ip (global configuration)

To enable Multiprotocol Label Switching (MPLS) forwarding of IP version 4 (IPv4) packets along normally routed paths for the platform, use the **mpls ip** command in global configuration mode. To disable MPLS forwarding of IPv4 packets, use the **no** form of this command.

**mpls ip**

**no mpls ip**

## Syntax Description

This command has no arguments or keywords.

## Defaults

MPLS forwarding of IPv4 packets along normally routed paths is enabled for the platform.

## Command Modes

Global configuration

## Command History

| Release    | Modification  |
|------------|---|
| 12.0(10)ST | This command was introduced.                                  |
| 12.1(8a)E  | This command was integrated into Cisco IOS Release 12.1(8a)E. |
| 12.2(2)T   | This command was integrated into Cisco IOS Release 12.2(2)T.  |

## Usage Guidelines

MPLS forwarding of IPv4 packets along normally routed paths (sometimes called dynamic label switching) is enabled by this command. Enabling MPLS forwarding of IP packets for the platform does not enable it for a platform interface. For a given interface to perform dynamic label switching, this switching function must be enabled for the interface as well as for the platform.



### Note

Globally enabling MPLS forwarding of IPv4 packets for the platform is not sufficient by itself to initiate label distribution. The Label Distribution Protocol (LDP)/Tag Distribution Protocol (TDP) is not initialized until you configure MPLS forwarding of IPv4 packets for some interface or you configure a targeted session. See the “mpls ip (interface configuration)” section.

The **no** form of this command stops dynamic label switching for all platform interfaces, regardless of the interface configuration; it also stops distribution of labels for dynamic label switching. Instead of entering the **no mpls ip** command individually for each interface, you can stop dynamic label switching on all platform interfaces by entering the command once in global configuration mode. You can then reenabling label switching for all platform interfaces by entering an **mpls ip** command in global configuration mode. (This is commonly known as globally toggling MPLS IP [**no mpls ip/mpls ip**].)

For a label-controlled ATM (LC-ATM) interface, the **no** form of this command prevents the establishment of label virtual circuits originating at, terminating at, or passing through the platform.

The **no mpls ip** command does not affect the sending of labeled packets through label switch path (LSP) tunnels.

---

**Examples**

The following example shows how to disable dynamic label switching for the platform and how to terminate all label distribution for the platform:

```
Router(config)# no mpls ip
```

---

**Related Commands**

| Command                                  | Description   |
|--|---|
| <b>mpls ip</b> (interface configuration) | Enables MPLS forwarding of IPv4 packets along normally routed paths for a particular interface. |

---

# mpls ip (interface configuration)

To enable Multiprotocol Label Switching (MPLS) forwarding of IP version 4 (IPv4) packets along normally routed paths for a particular interface, use the **mpls ip** command in interface configuration mode. To disable MPLS forwarding of IPv4 packets, use the **no** form of this command.

**mpls ip**

**no mpls ip**

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

**Defaults** MPLS forwarding of IPv4 packets along normally routed paths is disabled for the interface.

**Command Modes** Interface configuration

## Command History

| Release    | Modification  |
|------------|---|
| 12.0(10)ST | This command was introduced.                                  |
| 12.1(8a)E  | This command was integrated into Cisco IOS Release 12.1(8a)E. |
| 12.2(2)T   | This command was integrated into Cisco IOS Release 12.2(2)T.  |

## Usage Guidelines

MPLS forwarding of IPv4 packets along normally routed paths is sometimes called dynamic label switching. If dynamic label switching is enabled for the platform when this command is issued on an interface, label distribution for the interface begins with the periodic transmission of neighbor Discovery Hello messages on the interface. The **mpls ip (interface configuration)** command works in conjunction with the **mpls ip (global configuration)** command to enable label distribution for the platform interface. When the outgoing label for a destination that is routed through the interface is known, packets for the destination are assigned that outgoing label and forwarded through the interface.



### Note

Enabling MPLS forwarding of IPv4 packets for an interface is not sufficient by itself to initiate label distribution. MPLS forwarding of IPv4 packets must also be enabled for the platform before label distribution begins. See the **mpls ip (global configuration)** command.

The **no** form of this command causes packets routed out through the interface to be sent unlabeled; this form of the command also terminates label distribution for the interface. However, the **no** form of the command does not affect the sending of labeled packets through any LSP tunnels that might use the interface.

For a label-controlled ATM (LC-ATM) interface, the **no** form of this command prevents the establishment of label virtual circuits beginning at, terminating at, or passing through the interface.

**Examples** The following example shows how to enable label switching on the specified Ethernet interface:

```
Router(config)# configure terminal  
Router(config-if)# interface Ethernet 0/2  
Router(config-if)# mpls ip
```

**Related Commands**

| <b>Command</b>                        | <b>Description</b>  |
|---------------------------------------|---|
| <b>mpls ip (global configuration)</b> | Enables label switching of IPv4 packets along normally routed paths for the platform.                               |
| <b>mpls ldp maxhops</b>               | Limits the number of hops permitted in an LSP established by the Downstream-on-Demand method of label distribution. |
| <b>show mpls interfaces</b>           | Displays information about one or more interfaces that have been configured for label switching.                    |

# mpls ip default-route

To enable the distribution of labels associated with the IP default route, use the **mpls ip default-route** command in global configuration mode.

## mpls ip default-route

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

**Defaults** No distribution of labels for the IP default route.

**Command Modes** Global configuration

| Command History | Release  | Modification  |
|-----------------|----------|---|
|                 | 11.1 CT  | This command was introduced.  |
|                 | 12.1(3)T | This command was modified to reflect new Multiprotocol Label Switching (MPLS) Internet Engineering Task Force (IETF) terminology. |

**Usage Guidelines** Dynamic label switching (that is, distribution of labels based on routing protocols) must be enabled before you can use the **mpls ip default-route** command.

**Examples** The following example shows how to enable the distribution of labels associated with the IP default route:

```
Router# configure terminal
Router(config)# mpls ip
Router(config)# mpls ip default-route
```

| Related Commands | Command                                  | Description   |
|------------------|--|---|
|                  | <b>mpls ip (global configuration)</b>    | Enables MPLS forwarding of IPv4 packets along normally routed paths for the platform.           |
|                  | <b>mpls ip (interface configuration)</b> | Enables MPLS forwarding of IPv4 packets along normally routed paths for a particular interface. |

# mpls ip encapsulate explicit-null

To encapsulate all packets forwarded from the interface or subinterface with an explicit NULL label header, use the **mpls ip encapsulate explicit-null** command in interface configuration or subinterface configuration mode. To disable this function, use the **no** form of this command.

**mpls ip encapsulate explicit-null**

**no mpls ip encapsulate explicit-null**

## Syntax Description

This command has no arguments or keywords.

## Defaults

Packets are sent out without an explicit NULL label header.

## Command Modes

Interface configuration  
Subinterface configuration

## Command History

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

## Usage Guidelines

This is a per-interface command. The command establishes an explicit NULL LSP at the customer edge (CE) router. If MPLS is configured on a router and you enter this command, an error message occurs. This command is also supported on the Cisco 2600 series and Cisco 3600 series platforms.

## Examples

The following example shows how to encapsulate all packets forwarded onto the interface or subinterface with an explicit NULL label header:

```
Router(config-if)# mpls ip encapsulate explicit-null
```

# mpls ip propagate-ttl

To control the generation of the time-to-live (TTL) field in the Multiprotocol Label Switching (MPLS) header when labels are first added to an IP packet, use the **mpls ip propagate-ttl** command in global configuration mode. To use a fixed TTL value (255) for the first label of the IP packet, use the **no** form of this command.

**mpls ip propagate-ttl**

**no mpls ip propagate-ttl [forwarded | local]**

## Syntax Description

|                  |   |
|------------------|---|
| <b>forwarded</b> | (Optional) Prevents the <b>traceroute</b> command from showing the hops for forwarded packets.  |
| <b>local</b>     | (Optional) Prevents the <b>traceroute</b> command from showing the hops only for local packets. |

## Defaults

This command is enabled. The TTL field is copied from the IP header. A **traceroute** command shows all of the hops in the network.

## Command Modes

Global configuration

## Command History

| Release  | Modification   |
|----------|--|
| 12.1(3)T | This command was introduced.   |
| 12.1(5)T | The keywords <b>forwarded</b> and <b>local</b> were added to this command. |

## Usage Guidelines

By default, the **mpls ip propagate-ttl** command is enabled and the IP TTL value is copied to the MPLS TTL field during label imposition. To disable TTL propagation for all packets, use the **no mpls ip propagate-ttl** command. To disable TTL propagation for only forwarded packets, use the **no mpls ip propagate forwarded** command. Disabling TTL propagation of forwarded packets allows the structure of the MPLS network to be hidden from customers, but not the provider.

This feature supports the IETF draft document *ICMP Extensions for Multiprotocol Label Switching*, draft-ietf-mpls-label-icmp-01.txt. The document can be accessed at the following URL:

<http://www2.ietf.org/internet-drafts/draft-ietf-mpls-label-icmp-01.txt>

## Examples

The following example shows how to disable the TTL field in the MPLS header for only forwarded packets:

```
Router(config)# no mpls ip propagate-ttl forwarded
```

---

**Related Commands**

| <b>Command</b>    | <b>Description</b>   |
|-------------------|--|
| <b>traceroute</b> | Displays the routes that packets take through a network to their destinations. |

# mpls ip ttl-expiration pop

To specify how a packet with an expired time-to-live (TTL) value is forwarded, use the **mpls ip ttl-expiration pop** command in global configuration mode. To disable this function, use the **no** form of this command.

**mpls ip ttl-expiration pop** *labels*

**no mpls ip ttl-expiration pop** *labels*

## Syntax Description

|               |  |
|---------------|--|
| <i>labels</i> | The maximum number of labels in the packet necessary for the packet to be forwarded by means of the global IP routing table. |
|---------------|--|

## Defaults

The packets are forwarded by the original label stack. However, in previous versions of Cisco IOS software, the packets were forwarded by the global routing table by default.

|         |  |
|---------|--|
| 12.0 S  | Packets are forwarded through the use of the global routing table. |
| 12.0 ST | Packets are forwarded through the use of the original label stack. |
| 12.1 T  | Packets are forwarded through the use of the original label stack. |

## Command Modes

Global configuration

## Command History

| Release  | Modification                 |
|----------|------------------------------|
| 12.1(5)T | This command was introduced. |

## Usage Guidelines

You can specify that the packet be forwarded by the global IP routing table or by the packet's original label stack. The forwarding method is determined by the number of labels in the packet. You specify the number of labels as part of the command. If the packet contains the same or fewer labels than you specified, it is forwarded through the use of the global IP routing table. If the packet contains more labels than you specified, the packet is forwarded through the use of the original label stack.

This command is useful if expired TTL packets do not get back to their source, because there is a break in the Interior Gateway Protocol (IGP) path. Currently, MPLS forwards the expired TTL packets by reimposing the original label stack and forwarding the packet to the end of a label switched path (LSP). (For provider edge routers forwarding traffic over a Virtual Private Network (VPN), this is the only way to get the packet back to the source.) If there is a break in the IGP path to the end of the LSP, the packet never reaches its source.

If packets have a single label, that label is usually a global address or terminal VPN label. Those packets can be forwarded through the use of the global IP routing table. Packets that have more than one label can be forwarded through the use of the original label stack. Enter the **mpls ip ttl-expiration pop 1** command to enable forwarding based on more than one label. (This is the most common application of the command.)

---

**Examples**

The following example shows how to enable forwarding based on more than one label:

```
Router(config)# mpls ip ttl-expiration pop 1
```

---

**Related Commands**

| Command           | Description  |
|-------------------|--|
| <b>traceroute</b> | Displays the routes that packets take through a network to their destinations. |

---

# mpls ipv6 source-interface



## Note

Effective with Cisco IOS Release 12.2(25)S, the **mpls ipv6 source-interface** command is no longer available in Cisco IOS software.

To specify an IPv6 address of an interface to be used as the source address for locally generated IPv6 packets to be sent over a Multiprotocol Label Switching (MPLS) network, use the **mpls ipv6 source-interface** command in global configuration mode. To disable this feature, use the **no** form of this command.

**mpls ipv6 source-interface** *type number*

**no mpls ipv6 source-interface**

## Syntax Description

|                    |   |
|--------------------|---|
| <i>type number</i> | The interface type and number whose IPv6 address is to be used as the source for locally generated IPv6 packets to be sent over an MPLS backbone. |
| <b>Note</b>        | A space between the <i>type</i> and <i>number</i> arguments is not required.  |

## Defaults

This command is disabled.

## Command Modes

Global configuration

## Command History

| Release   | Modification   |
|-----------|--|
| 12.0(22)S | This command was introduced.   |
| 12.2(14)S | This command was integrated into Cisco IOS Release 12.2(14)S.              |
| 12.2(25)S | This command was removed and is no longer available in Cisco IOS software. |

## Usage Guidelines

Use this command in conjunction with the **neighbor send-label** address family configuration command to allow IPv6 traffic to run over an IPv4 MPLS network without any software or hardware configuration changes in the backbone. Edge routers, configured to run both IPv4 and IPv6, forward IPv6 traffic using MPLS and multiprotocol internal BGP (MP-iBGP).

## Examples

The following example shows loopback interface 0 being configured as a source address for locally generated IPv6 packets:

```
interface Loopback0
 ip address 192.168.99.5 255.255.255.255
 ipv6 address 2001:0DB8::1/32
!
mpls ipv6 source-interface loopback0
```

**Related Commands**

| <b>Command</b>             | <b>Description</b>   |
|----------------------------|--|
| <b>neighbor send-label</b> | Advertises the capability of the router to send MPLS labels with BGP routes. |

# mpls l2transport route

To enable routing of Any Transport over MPLS (AToM) packets over a specified virtual circuit (VC), use the **mpls l2transport route** command in the appropriate command mode. To delete the VC, use the **no** form of this command on both routers.

**mpls l2transport route** *destination* *vc-id*

**no mpls l2transport route** *destination* *vc-id*

## Syntax Description

|                    |   |
|--------------------|---|
| <i>destination</i> | Specifies the Label Distribution Protocol (LDP) IP address of the remote provider edge (PE) router. |
| <i>vc-id</i>       | Assigns a VC ID to the virtual circuit between two PE routers.                                      |

## Defaults

No default behavior or values

## Command Modes

Depending on the AToM transport type you are configuring, you use the **mpls l2transport route** command in one of the following command modes:

| Transport Type          | Command Mode                    |
|-------------------------|---------------------------------|
| ATM AAL5 and Cell Relay | ATM VC configuration mode       |
| Ethernet VLAN           | Subinterface configuration mode |
| Frame Relay             | Connect submode                 |
| HDLC and PPP            | Interface configuration mode    |

## Command History

| Release    | Modification   |
|------------|--|
| 12.1(8a)E  | This command was introduced.                                   |
| 12.0(21)ST | This command was integrated into Cisco IOS Release 12.0(21)ST. |
| 12.0(23)S  | This command was integrated into Cisco IOS Release 12.0(23)S.  |
| 12.2(14)S  | This command was integrated into Cisco IOS Release 12.2(14)S.  |
| 12.2(15)T  | This command was integrated into Cisco IOS Release 12.2(15)T.  |

## Usage Guidelines

A Multiprotocol Label Switching (MPLS) VC runs across an MPLS cloud to connect interfaces on two PE routers.

Use this command on each PE router to route packets across the MPLS cloud to the interface of the other PE router. Specify the LDP IP address of the other PE router for the *destination* parameter. Do not specify the IP address of the router from which you are issuing the command.

You can choose any number for the VC ID. However, the VC ID must be unique per pair of routers. Therefore, in large networks, it may be necessary to track the VC ID assignments to ensure that a VC ID does not get assigned twice.

## Examples

The following examples show you how to enable routing of MPLS packets over a specified VC. Two routers named PE1 and PE2 establish a VC to transport packets. PE1 has IP address 172.16.0.1, and PE2 has IP address 192.168.0.1. The VC ID is 50.

### ATM AAL5 over MPLS Example

At PE1, you issue the following commands:

```
PE1_Router(config)# interface atm5/0.100
PE1_Router(config-if)# pvc 1/200
PE1_Router(config-atm-vc)# encapsulation aal5
PE1_Router(config-atm-vc)# mpls l2transport route 192.168.0.1 50
```

At PE2, you issue the following commands:

```
PE2_Router(config)# interface atm5/0.100
PE2_Router(config-if)# pvc 1/200
PE2_Router(config-atm-vc)# encapsulation aal5
PE2_Router(config-atm-vc)# mpls l2transport route 172.16.0.1 50
```

### ATM Cell Relay over MPLS Example

At PE1, you issue the following commands:

```
PE1_Router(config)# interface atm5/0.100
PE1_Router(config-if)# pvc 1/200 l2transport
PE1_Router(config-atm-vc)# encapsulation aal0
PE1_Router(config-atm-vc)# mpls l2transport route 192.168.0.1 50
```

At PE2, you issue the following commands:

```
PE2_Router(config)# interface atm5/0.100
PE2_Router(config-if)# pvc 1/200 l2transport
PE2_Router(config-atm-vc)# encapsulation aal0
PE2_Router(config-atm-vc)# mpls l2transport route 172.16.0.1 50
```

### Ethernet over MPLS Example

At PE1, you issue the following commands:

```
PE1_Router(config)# interface GigabitEthernet1/0.2
PE1_Router(config-subif)# encapsulation dot1Q 200
PE1_Router(config-subif)# mpls l2transport route 192.168.0.1 50
```

At PE2, you issue the following commands:

```
PE2_Router(config)# interface GigabitEthernet2/0.1
PE2_Router(config-subif)# encapsulation dot1Q 200
PE2_Router(config-subif)# mpls l2transport route 172.16.0.1 50
```

### Frame Relay over MPLS Example

At PE1, you issue the following commands:

```
PE1_Router(config)# connect frompls1 Serial5/0 1000 l2transport
PE1_Router(config-fr-pw-switching)# mpls l2transport route 192.168.0.1 50
```

At PE2, you issue the following commands:

```
PE2_Router(config)# connect frompls2 Serial2/0 102 l2transport
```

```
PE2_Router(config-fr-pw-switching)# mpls l2transport route 172.16.0.1 50
```

### HDLC over MPLS Example

At PE1, you issue the following commands:

```
PE1_Router(config)# interface Serial3/0
PE1_Router(config-if)# encapsulation hdlc
PE1_Router(config-if)# mpls l2transport route 192.168.0.1 50
```

At PE2, you issue the following commands:

```
PE2_Router(config)# interface Serial1/0
PE2_Router(config-if)# encapsulation hdlc
PE2_Router(config-if)# mpls l2transport route 172.16.0.1 50
```

### PPP over MPLS Example

At PE1, you issue the following commands:

```
PE1_Router(config)# interface Serial3/0
PE1_Router(config-if)# encapsulation ppp
PE1_Router(config-if)# mpls l2transport route 192.168.0.1 50
```

At PE2, you issue the following commands:

```
PE2_Router(config)# interface Serial1/0
PE2_Router(config-if)# encapsulation ppp
PE2_Router(config-if)# mpls l2transport route 172.16.0.1 50
```

### Related Commands

| Command                         | Description  |
|---------------------------------|--|
| <b>show mpls l2transport vc</b> | Displays information about AToM VCs that have been enabled to route Layer 2 packets on a router. |

# mpls label protocol (global configuration)

To specify the default label distribution protocol for a platform, use the **mpls label protocol** command in global configuration mode. To restore the image default, use the **no** form of this command.

**mpls label protocol {ldp | tdp}**

**no mpls label protocol**

| Syntax Description | ldp   | tdp   |
|--------------------|---|---|
|                    | Specifies that Label Distribution Protocol (LDP) is the platform default label distribution protocol. | Specifies that Tag Distribution Protocol (TDP) is the platform default label distribution protocol. |

**Defaults** If no protocol is explicitly configured by the **mpls label protocol** command, TDP is the default label distribution protocol for the platform.

**Command Modes** Global configuration

| Command History | Release    | Modification  |
|-----------------|------------|---|
|                 | 12.0(10)ST | This command was introduced.                                  |
|                 | 12.1(8a)E  | This command was integrated into Cisco IOS Release 12.1(8a)E. |
|                 | 12.2(2)T   | This command was integrated into Cisco IOS Release 12.2(2)T.  |

**Usage Guidelines** If neither the global **mpls label protocol ldp** command nor the interface **mpls label protocol ldp** command is used, all label distribution sessions will use TDP.

To force all label distribution sessions to use LDP, use the global **mpls label protocol ldp** command and no interface **mpls label protocol** commands.

**Examples** The following example shows how to establish LDP as the label distribution protocol for the platform.

```
Router(config)# mpls label protocol ldp
```

| Related Commands | Command  | Description   |
|------------------|--|---|
|                  | <b>mpls label protocol (interface configuration)</b> | Specifies the label distribution protocol to be used on a given interface.                                |
|                  | <b>show mpls interfaces</b>                          | Displays MPLS information about interfaces, including the configured tag and label distribution protocol. |

# mpls label protocol (interface configuration)

To specify the label distribution protocol to be used on a given interface, use the **mpls label protocol** command in interface configuration mode. To remove the label distribution protocol, use the **no** form of this command.

**mpls label protocol {ldp | tdp | both}**

**no mpls label protocol**

## Syntax Description

|             |  |
|-------------|--|
| <b>ldp</b>  | Specifies that Label Distribution Protocol (LDP) is to be used on the interface.   |
| <b>tdp</b>  | Specifies that the Tag Distribution Protocol (TDP) is to be used on the interface. |
| <b>both</b> | Specifies that both LDP and TDP are to be supported on the interface.              |

## Defaults

If no protocol is explicitly configured for an interface, the default label distribution protocol for the platform is used. To set the platform default protocol, use the global **mpls label protocol** command.

## Command Modes

Interface configuration

## Command History

| Release    | Modification  |
|------------|---|
| 12.0(10)ST | This command was introduced.                                  |
| 12.1(8a)E  | This command was integrated into Cisco IOS Release 12.1(8a)E. |
| 12.2(2)T   | This command was integrated into Cisco IOS Release 12.2(2)T.  |

## Usage Guidelines

To successfully establish a session for label distribution for a link connecting two label switch routers (LSRs), the link interfaces on the LSRs must be configured to use the same label distribution protocol. If there are multiple links connecting two LSRs, all of the link interfaces connecting the two LSRs must be configured to use the same protocol.

The **both** keyword is intended for use with interfaces to multiaccess networks, such as Ethernet and FDDI, where some peers might use LDP while others use TDP. When you specify the **both** keyword, the LSR sends both LDP and TDP discovery Hello messages and responds to both types of messages.

## Examples

The following example shows how to establish LDP as the label distribution protocol for the interface.

```
Router(config-if)# mpls label protocol ldp
```

**Related Commands**

| <b>Command</b>                                    | <b>Description</b>  |
|---|---|
| <b>mpls label protocol (global configuration)</b> | Specifies the default label distribution protocol for a platform.   |
| <b>show mpls interfaces</b>                       | Displays MPLS information about interfaces, including the configured tag and label distribution protocol. |

# mpls label range

To configure the range of local labels available for use on packet interfaces, use the **mpls label range** command in global configuration mode. To revert to the platform defaults, use the **no** form of this command.

**mpls label range** *min max*

**no mpls label range**

## Syntax Description

|            |   |
|------------|---|
| <i>min</i> | The smallest label allowed in the label space. The default is 16.     |
| <i>max</i> | The largest label allowed in the label space. The default is 1048575. |

## Defaults

*min*: 16  
*max*: 1048575

## Command Modes

Global configuration

## Command History

| Release  | Modification   |
|----------|--|
| 11.1CT   | This command was introduced.   |
| 12.1(3)T | This command was modified to reflect new MPLS IETF terminology and CLI command syntax. |

## Usage Guidelines

The labels 0 through 15 are reserved by the IETF (see draft-ietf-mpls-label-encaps-07.txt for details) and cannot be included in the range specified by the **mpls label range** command.

The label range defined by the **mpls label range** command is used by all Multiprotocol Label Switching (MPLS) applications that allocate local labels (for dynamic label switching, MPLS traffic engineering, MPLS Virtual Private Networks (VPNs), and so on).

If you specify a new label range that does not overlap the range currently in use, the new range does not take effect until the router is reloaded again.

## Examples

The following example shows how to configure the size of the local label space. In this example, the *min* argument is set to 200, and the *max* value is set to 120000. Because the new range does not overlap the current label range, the new range does not take effect until the router is reloaded.

```
Router# configure terminal
Router(config)# mpls label range 200 120000

% Label range changes will take effect at the next reload.
Router(config)#
```

If you had specified a new range that overlaps the current range (for example, new range of the *min* argument of 16 and the *max* argument of 120000), then the new range would take effect immediately.

| <b>Related Commands</b> | <b>Command</b>               | <b>Description</b>                                |
|-------------------------|------------------------------|---|
|                         | <b>show mpls label range</b> | Displays the range of the MPLS local label space. |

