show tag-switching tdp discovery

To display the status of the LDP discovery process, use the **show tag-switching tdp discovery** command in privileged EXEC mode.

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.1 CT	This command was introduced.

Usage Guidelines

Status of the LDP discovery process means a list of interfaces over which LDP discovery is running.

Examples

The following is sample output from the **show tag-switching tdp discovery** command.

```
Router# show tag-switching tdp discovery

Local TDP Identifier:
    172.27.32.29:0
TDP Discovery Sources:
    Interfaces:
ATM0/0.1:       xmit/recv
ATM0/0.1:       xmit/rec
Ethernet4/0/1:  xmit/recv
Ethernet4/0/2:  xmit/recv
POS6/0/0:       xmit/recv
```

Table 94 describes the significant fields shown in the output.

Table 94 show tag-switching tdp discovery Field Descriptions

Field	Description
Local TDP Identifier	The LDP identifier for the local router. An LDP identifier is a 6-byte quantity displayed as an IP address:number. The Cisco convention is to use a router ID for the first 4 bytes of the LDP identifier, and integers starting with 0 for the final 2 bytes of the IP address:number.
Interfaces	Lists the interfaces engaging in LDP discovery activity. “xmit” indicates that the interface is sending LDP discovery hello packets; “recv” indicates that the interface is receiving LDP discovery hello packets.

Related Commands

Command	Description
show tag-switching tdp neighbors	Displays the status of LDP sessions.

show tag-switching tdp neighbors

To display the status of Label Distribution Protocol (LDP) sessions, use the **show tag-switching tdp neighbors** command in privileged EXEC mode.

show tag-switching tdp neighbors [*address* | *interface*] [**detail**]

Syntax Description

address	(Optional) The neighbor that has this IP address.
interface	(Optional) LDP neighbors accessible over this interface.
detail	(Optional) Displays information in long form.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.1 CT	This command was introduced.

Usage Guidelines

The neighbor information branch can give information about all LDP neighbors, or it can be limited to

- The neighbor with a specific IP address
- LDP neighbors known to be accessible over a specific interface

Examples

The following is sample output from the **show tag-switching tdp neighbors** command:

```
Router# show tag-switching tdp neighbors

Peer TDP Ident: 10.220.0.7:1; Local TDP Ident 172.27.32.29:1
        TCP connection: 10.220.0.7.711 - 172.27.32.29.11029
        State: Oper; PIEs sent/rcvd: 17477/17487; Downstream on demand
Up time: 01:03:00
TDP discovery sources:
          ATM0/0.1
Peer TDP Ident: 210.10.0.8:0; Local TDP Ident 172.27.32.29:0
        TCP connection: 210.10.0.8.11004 - 172.27.32.29.711
        State: Oper; PIEs sent/rcvd: 14656/14675; Downstream
Up time: 2d5h
        TDP discovery sources:
          Ethernet4/0/1
          Ethernet4/0/2
          POS6/0/0
        Addresses bound to peer TDP Ident:
          99.101.0.8      172.27.32.28    10.105.0.8      10.92.0.8
          10.205.0.8      210.10.0.8
```

Table 95 describes the significant fields shown in the output.

Table 95 show tag-switching tdp neighbors Field Descriptions

Field	Description
Peer TDP Ident	The LDP identifier of the neighbor (peer device) for this session.
Local TDP Ident	The LDP identifier for the local LSR (TSR) for this session.
TCP connection	The TCP connection used to support the LDP session. The format for displaying the TCP connection is as follows: *peer IP address.peer port* *local IP address.local port*
State	The state of the LDP session. Generally this is Oper (operational), but Transient is another possible state.
PIEs sent/rcvd	The number of LDP protocol information elements (PIEs) sent to and received from the session peer device. The count includes the transmission and receipt of periodic keepalive PIEs, which are required for maintenance of the LDP session.
Downstream	Indicates that the downstream method of label distribution is being used for this LDP session. When the downstream method is used, an LSR advertises all of its locally assigned (incoming) labels to its LDP peer device (subject to any configured access list restrictions).
Downstream on demand	Indicates that the downstream-on-demand method of label distribution is being used for this LDP session. When the downstream-on-demand method is used, an LSR advertises its locally assigned (incoming) labels to its LDP peer device only when the peer device asks for them.
Up time	The length of time the LDP session has existed.
TDP discovery sources	The sources of LDP discovery activity that led to the establishment of this LDP session.
Addresses bound to peer TDP Ident	The known interface addresses of the LDP session peer device. These are addresses that may appear as next hop addresses in the local routing table. They are used to maintain the label forwarding information base (LFIB).

Related Commands

Command	Description
show tag-switching tdp discovery	Displays the status of the LDP discovery process.

show tag-switching tdp parameters

To display available LDP (TDP) parameters, use the **show tag-switching tdp parameters** command in privileged EXEC mode.

show tag-switching tdp parameters

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.1 CT	This command was introduced.

Examples

The following is sample output from the **show tag-switching tdp parameters** command:

```
Router# show tag-switching tdp parameters

Protocol version: 1
 Downstream tag pool: min tag: 10; max_tag: 10000; reserved tags: 16
 Session hold time: 15 sec; keep alive interval: 5 sec
 Discovery hello: holdtime: 15 sec; interval: 5 sec
 Discovery directed hello: holdtime: 15 sec; interval: 5 sec
 Accepting directed hellos
```

Table 96 describes the significant fields shown in the output.

Table 96 show tag-switching tdp parameters Field Descriptions

Field	Description
Protocol version	Indicates the version of the LDP running on the platform.
Downstream tag pool	Describes the range of labels available for the platform to assign for label switching. The labels available run from the smallest label value (min label) to the largest label value (max label), with a modest number of labels at the low end of the range (reserved labels) reserved for diagnostic purposes.
Session hold time	Indicates the time to maintain an LDP session with an LDP peer device without receiving LDP traffic or an LDP keepalive from the peer device.
keep alive interval	Indicates the interval of time between consecutive transmission LDP keepalive messages to an LDP peer device.
Discovery hello	Indicates the amount of time to remember that a neighbor platform wants an LDP session without receiving an LDP hello message from the neighbor (hold time), and the time interval between sending LDP hello messages to neighbors (interval).

Table 96 show tag-switching tdp parameters Field Descriptions (continued)

Field	Description
Discovery directed hello	Indicates the amount of time to remember that a neighbor platform wants an LDP session when the neighbor platform is not directly connected to the router and the neighbor platform has not sent an LDP hello message. The interval is known as hold time. Also indicates the time interval between the transmission of hello messages to a neighbor not directly connected to the router.
Accepting directed hellos	Indicates that the platform will accept and act on directed LDP hello messages. This field may not be present.

Related Commands

Command	Description
tag-switching tdp discovery	Configures the interval between transmission of LDP discovery hello messages.
tag-switching tdp holdtime	Enables LSP tunnel functionality on a device.

show tag-switching tsp-tunnels

The **show tag-switching tsp-tunnels** command is replaced by the **show mpls traffic-eng tunnels** command. See the **show mpls traffic-eng tunnels** command for more information.

show vlans

To view virtual LAN (VLAN) subinterfaces, use the **show vlans** privileged EXEC command.

show vlans

Syntax Description

This command has no arguments or keywords.

Defaults

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.0	This command was introduced.
12.1(3)T	This command was modified to display traffic count on FastEthernet subinterfaces.

Examples

The following is sample output from the **show vlans** command:

```
RouterC7xxx# show vlans

Virtual LAN ID:  2 (IEEE 802.1Q Encapsulation)

    vLAN Trunk Interface:   FastEthernet5/0.1

    Protocols Configured:   Address:              Received:        Transmitted:
            IP              56.0.0.3                    16               92129

Virtual LAN ID:  3 (IEEE 802.1Q Encapsulation)

    vLAN Trunk Interface:   Ethernet6/0/1.1

    Protocols Configured:   Address:              Received:        Transmitted:
            IP              36.0.0.3                  1558               1521

Virtual LAN ID:  4 (Inter Switch Link Encapsulation)

    vLAN Trunk Interface:   FastEthernet5/0.2

    Protocols Configured:   Address:              Received:        Transmitted:
            IP              76.0.0.3                     0                  7
```

The following is sample output from the **show vlans** command indicating a native VLAN and a bridged group:

```
Virtual LAN ID:  1 (IEEE 802.1Q Encapsulation)

   vLAN Trunk Interface:   FastEthernet1/0/2

 This is configured as native Vlan for the following interface(s) :
```

```
FastEthernet1/0/2

   Protocols Configured:   Address: Received:        Transmitted:

Virtual LAN ID:  100 (IEEE 802.1Q Encapsulation)

   vLAN Trunk Interface:   FastEthernet1/0/2.1

   Protocols Configured:   Address: Received:        Transmitted:

        Bridging        Bridge Group 1 0                  0
```

Table 97 describes the significant fields shown in the output.

Table 97 show vlans Field Descriptions

Field	Description
Virtual LAN ID	Domain number of the VLAN.
vLAN Trunk Interface	Subinterface that carries the VLAN traffic.
Protocols Configured	Protocols configured on the VLAN.
Address	Network address.
Received	Packets received.
Transmitted	Packets sent.

show xtagatm cos-bandwidth-allocation xtagatm

To display information about QoS bandwidth allocation on extended MPLS ATM interfaces, use the **show xtagatm cos-bandwidth-allocation xtagatm** EXEC command.

show xtagatm cos-bandwidth-allocation xtagatm [**xtagatm** *interface number*]

Syntax Description

xtagatm *interface number*	(Optional) Specifies the XTagATM interface number.

Defaults

Available 50 percent, control 50 percent.

Command Modes

EXEC

Command History

Release	Modification
12.0(5)T	This command was introduced.

Usage Guidelines

Use this command to display CoS bandwidth allocation information for the following CoS traffic categories:

- Available
- Standard
- Premium
- Control

Examples

The following example shows output from this command:

```
Router# show xtagatm cos-bandwidth-allocation xtagatm 123

CoSBandwidth allocation
available25%
standard25%
premium25%
control25%
```

show xtagatm cross-connect

To display information about the LSC view of the cross-connect table on the remotely controlled ATM switch, use the **show xtagatm cross-connect** EXEC command.

show xtagatm cross-connect [*traffic*] [{**interface** *interface* [*vpi vci*] | **descriptor** *descriptor* [*vpi vci*]]

Syntax Description

traffic	(Optional) Displays receive and transmit cell counts for each connection.
interface *interface*	(Optional) Displays only connections with an endpoint of the specified interface.
vpi vci	(Optional) Displays only detailed information on the endpoint with the specified VPI/VCI on the specified interface.
descriptor *descriptor*	(Optional) Displays only connections with an endpoint on the interface with the specified physical descriptor.

Defaults

No default behavior or values.

Related Commands

EXEC

Command History

Release	Modification
12.0(5)T	This command was introduced.

Examples

Each connection is listed twice in the sample output from the **show xtagatm cross-connect** command under each interface that is linked by the connection. Connections are marked as -> (unidirectional traffic flow, into the first interface), <- (unidirectional traffic flow, away from the interface), or <-> (bidirectional).

The following is sample output from the **show xtagatm cross-connect** command:

```
Router# show xtagatm cross-connect

Phys Desc    VPI/VCI     Type   X-Phys Desc  X-VPI/VCI   State

10.1.0       1/37        ->     10.3.0       1/35        UP
10.1.0       1/34        ->     10.3.0       1/33        UP
10.1.0       1/33        <->    10.2.0       0/32        UP
10.1.0       1/32        <->    10.3.0       0/32        UP
10.1.0       1/35        <-     10.3.0       1/34        UP
10.2.0       1/57        ->     10.3.0       1/49        UP
10.2.0       1/53        ->     10.3.0       1/47        UP
10.2.0       1/48        <-     10.1.0       1/50        UP
10.2.0       0/32        <->    10.1.0       1/33        UP
10.3.0       1/34        ->     10.1.0       1/35        UP
10.3.0       1/49        <-     10.2.0       1/57        UP
10.3.0       1/47        <-     10.2.0       1/53        UP
10.3.0       1/37        <-     10.1.0       1/38        UP
```

```
10.3.0        1/35        <-      10.1.0        1/37        UP
10.3.0        1/33        <-      10.1.0        1/34        UP
10.3.0        0/32        <->     10.1.0        1/32        UP
```

Table 98 describes the significant fields in the sample command output shown above.

Table 98 show xtagatm cross-connect Field Descriptions

Field	Description
Phys desc	Physical descriptor. A switch-supplied string identifying the interface on which the endpoint exists.
VPI/VCI	Virtual path identifier and virtual channel identifier for this endpoint.
Type	The notation -> indicates an ingress endpoint, where traffic is only expected to be received into the switch; <- indicates an egress endpoint, where traffic is only expected to be sent from the interface; <-> indicates that traffic is expected to be both sent and received at this endpoint.
X-Phys Desc	Physical descriptor for the interface of the other endpoint belonging to the cross-connect.
X-VPI/VCI	Virtual path identifier and virtual channel identifier of the other endpoint belonging to the cross-connect.
State	Indicates the status of the cross-connect to which this endpoint belongs. The state is typically UP; other values, all of which are transient, include the following: • DOWN • ABOUT_TO_DOWN • ABOUT_TO_CONNECT • CONNECTING • ABOUT_TO_RECONNECT • RECONNECTING • ABOUT_TO_RESYNC • RESYNCING • NEED_RESYNC_RETRY • ABOUT_TO_RESYNC_RETRY RETRYING_RESYNC • ABOUT_TO_DISCONNECT • DISCONNECTING

A sample of the detailed command output provided for a single endpoint is as follows.

```
Router# show xtagatm cross-connect descriptor 12.1.0 1 42

Phys desc:   12.1.0
Interface:   n/a
Intf type:   switch control port
VPI/VCI:     1/42
X-Phys desc: 12.2.0
X-Interface: XTagATM0
X-Intf type: extended tag ATM
X-VPI/VCI:   2/38
```

```
Conn-state:  UP
Conn-type:   input/output
Cast-type:   point-to-point
Rx service type:   Tag COS 0
Rx cell rate:      n/a
Rx peak cell rate: 10000
Tx service type:   Tag COS 0
Tx cell rate:      n/a
Tx peak cell rate: 10000
```

Table 99 describes the significant fields in the sample command output shown above.

Table 99 show xtagatm cross-connect descriptor Field Descriptions

Field	Description
Phys desc	Physical descriptor. A switch-supplied string identifying the interface on which the endpoint exists.
Interface	The (Cisco IOS) interface name.
Intf type	Interface type. Can be either extended MPLS ATM or a switch control port.
VPI/VCI	Virtual path identifier and virtual channel identifier for this endpoint.
X-Phys desc	Physical descriptor for the interface of the other endpoint belonging to the cross-connect.
X-Interface	The (Cisco IOS) name for the interface of the other endpoint belonging to the cross-connect.
X-Intf type	Interface type for the interface of the other endpoint belonging to the cross-connect.
X-VPI/VCI	Virtual path identifier and virtual channel identifier of the other endpoint belonging to the cross-connect.
Conn-state	Indicates the status of the cross-connect to which this endpoint belongs. The cross-connect state is typically UP; other values, all of which are transient, include the following: • DOWN ABOUT_TO_DOWN ABOUT_TO_CONNECT • CONNECTING • ABOUT_TO_RECONNECT • RECONNECTING • ABOUT_TO_RESYNC • RESYNCING • NEED_RESYNC_RETRY • ABOUT_TO_RESYNC_RETRY • RETRYING_RESYNC • ABOUT_TO_DISCONNECT • DISCONNECTING

Table 99 show xtagatm cross-connect descriptor Field Descriptions (continued)

Field	Description
Conn-type	Input—Indicates an ingress endpoint where traffic is only expected to be received into the switch. Output—Indicates an egress endpoint, where traffic is only expected to be sent from the interface. Input/output—Indicates that traffic is expected to be both send and received at this endpoint.
Cast-type	Indicates whether the cross-connect is multicast.
Rx service type	Quality of service type for the receive, or ingress, direction. This is MPLS QoS <*n*>, (MPLS Quality of Service <*n*>), where *n* is in the range from 0 to 7 for input and input/output endpoints; this will be N/A for output endpoints. (In the first release, this is either 0 or 7.)
Rx cell rate	(Guaranteed) cell rate in the receive, or ingress, direction.
Rx peak cell rate	Peak cell rate in the receive, or ingress, direction, in cells per second. This is n/a for an output endpoint.
Tx service type	Quality of service type for the transmit, or egress, direction. This is MPLS QoS <*n*>, (MPLS Class of Service <*n*>), where *n* is in the range from 0 to 7 for output and input/output endpoints; this will be N/A for input endpoints.
Tx cell rate	(Guaranteed) cell rate in the transmit, or egress, direction.
Tx peak cell rate	Peak cell rate in the transmit, or egress, direction, in cells per second. This is N/A for an input endpoint.

show xtagatm vc

To display information about terminating VCs on extended MPLS ATM (XTagATM) interfaces, use the **show xtagatm vc** EXEC command.

show xtagatm vc [*vcd* [*interface*]]

Syntax Description

vcd	(Optional) Virtual circuit descriptor (virtual circuit number). If you specify the *vcd* argument, then detailed information about all VCs with that *vcd* appears. If you do not specify the *vcd* argument, a summary description of all VCs on all XTagATM interfaces appears.
interface	(Optional) Interface number. If you specify the *interface* and the *vcd* arguments, the single VC with the specified *vcd* on the specified *interface* is selected.

Defaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modifications
12.0(5)T	This command was introduced.

Usage Guidelines

The columns in the output marked VCD, VPI, and VCI display information for the corresponding private VC on the control interface. The private VC connects the XTagATM VC to the external switch. It is termed private because its VPI and VCI are only used for communication between the MPLS LSC and the switch, and it is different from the VPI and VCI seen on the XTagATM interface and the corresponding switch port.

Examples

Each connection is listed twice in the sample output from the **show xtagatm vc cross-connect** command under each interface that is linked by the connection. Connections are marked as input (unidirectional traffic flow, into the interface), output (unidirectional traffic flow, away from the interface), or in/out (bidirectional).

The following is sample output from the **show xtagatm vc** command:

```
Router# show xtagatm vc

AAL / Control Interface
Interface     VCD   VPI   VCI Type  Encapsulation  VCD   VPI   VCI Status
XTagATM0        1     0    32  PVC  AAL5-SNAP        2     0    33 ACTIVE
XTagATM0        2     1    33  TVC  AAL5-MUX         4     0    37 ACTIVE
XTagATM0        3     1    34  TVC  AAL5-MUX         6     0    39 ACTIVE
```

Table 100 describes the significant fields shown in the output.

Table 100 show xtagatm vc Field Descriptions

Field	Description
VCD	Virtual circuit descriptor (virtual circuit number).
VPI	Virtual path identifier.
VCI	Virtual circuit identifier.
Control Interf. VCD	VCD for the corresponding private VC on the control interface.
Control Interf. VPI	VPI for the corresponding private VC on the control interface.
Control Interf. VCI	VCI for the corresponding private VC on the control interface.
Encapsulation	Displays the type of connection on the interface.
Status	Displays the current state of the specified ATM interface.

Related Commands

Command	Description
show atm vc	Displays information about private ATM VCs.
show xtagatm cross-connect	Displays information about remotely connected ATM switches.

tag-control-protocol vsi

To configure the use of VSI on a particular master control port, use the **tag-control-protocol vsi** interface configuration command. To disable VSI, use the **no** form of this command.

tag-control-protocol vsi [**id** *controller-id*] [**base-vc** *vpi vci*] [**slaves** *slave-count*] [**keepalive** *timeout*] [**retry** *timeout-count*]

no tag-control-protocol vsi [**id** *controller-id*] [**base-vc** *vpi vci*] [**slaves** *slave-count*] [**keepalive** *timeout*] [**retry** *timeout-count*]

Syntax Description

id *controller-id*	(Optional) Determines the value of the controller-id field present in the header of each VSI message. The default is 1.
base-vc *vpi vci*	(Optional) Determines the VPI/VCI value for the channel to the first slave. The default is 0/40. Together with the slave value, this value determines the VPI/VCI values for the channels to all of the slaves, which are as follows: • *vpi/vci* • *vpi/vci+1*, and so on • *vpi/vci+slave_count-1*
slaves *slave-count*	(Optional) Determines the number of slaves reachable through this master control port. The default is 14 (suitable for the Cisco BPX switch).
keepalive *timeout*	(Optional) Determines the value of the keepalive timer (in seconds). Make sure that the keepalive timer value is greater than the value of the *retry_timer* times the *retry_count+1*. The default is 15 seconds.
retry *timeout-count*	(Optional) Determines the value of the message retry timer (in seconds) and the maximum number of retries. The default is 8 seconds and 10 retries.

Defaults

No default behavior or values.

Command Modes

Interface configuration

Command History

Release	Modification
12.0(5)T	This command was introduced.

Usage Guidelines

The command is only available on interfaces that can serve as a VSI master control port. We recommend that all options to the **tag-control-protocol vsi** command be entered at the same time.

After VSI is active on the control interface (through the earlier issuance of a **tag-control-protocol vsi** command), reentering the command may cause all associated XTagATM interfaces to shut down and restart. In particular, if you reenter the **tag-control-protocol vsi** command with any of the following options, the VSI shuts down and reactivates on the control interface:

- **id**
- **base-vc**
- **slaves**

VSI remains continuously active (that is, the VSI does not shut down and then reactivate) if you reenter the **tag-control-protocol vsi** command with only one or both of the following options:

- **keepalive**
- **retry**

In either case, if you reenter the **tag-control-protocol vsi** command, this causes the specified options to take on the newly specified values; the other options retain their previous values. To restore default values to all the options, enter the **no tag-control-protocol** command, followed by the **tag-control-protocol vsi** command.

Examples

The following example shows how to configure the VSI driver on the control interface:

```
interface atm 0/0
tag-control-protocol vsi 0 51
```

tag-switching advertise-tags

To control the distribution of locally assigned (incoming) labels via the Label Distribution Protocol (LDP), use the **tag-switching advertise-tags** command in global configuration mode. To disable label advertisement, use the **no** form of this command.

tag-switching advertise-tags [**for** *access-list-number* [**to** *access-list-number*]]

no tag-switching advertise-tags [**for** *access-list-number* [**to** *access-list-number*]]

Syntax Description

for *access-list-number*	(Optional) Specifies which destinations should have their labels advertised.
to *access-list-number*	(Optional) Specifies which LSR neighbors should receive label advertisements. An LSR is identified by the router ID that is the first 4 bytes of its 6-byte LDP identifier.

Defaults

The labels of all destinations are advertised to all LSR neighbors.

Command Modes

Global configuration

Command History

Release	Modification
11.1 CT	This command was introduced.

Usage Guidelines

To enable the distribution of all locally assigned labels to all LDP neighbors, use the **tag-switching advertise-tags** command.

You can enter multiple **tag-switching advertise-tags** commands. Taken together, they determine how local labels are advertised.

Note This command has no effect for a TC-ATM interface. The effect is always as if the **tag-switching advertise-tags** command had been executed.

Examples

In the following example, the router is configured to advertise all locally assigned labels to all LDP neighbors. This is the default.

```
tag-switching advertise-tags
```

In the following example, the router is configured to advertise to all LDP neighbors labels for networks 10.101.0.0 and 10.221.0.0 only:

```
access-list 1 permit 10.101.0.0 0.0.255.255
```

```
access-list 4 permit 10.221.0.0 0.0.255.255
tag-switching advertise-tags for 1
tag-switching advertise-tags for 4
```

In the following example, the router is configured to advertise all labels to all LDP neighbors except neighbor 10.101.0.8:

```
access-list 1 permit any
access-list 2 deny  10.101.0.8
tag-switching advertise-tags
tag-switching advertise-tags for 1 to 2
```

tag-switching atm allocation-mode

To control the mode used for handling label binding requests on TC-ATM interfaces, use the **tag-switching atm allocation-mode** command in global configuration mode. To disable this feature, use the **no** form of this command.

tag-switching atm allocation-mode {**optimistic** | **conservative**}

no tag-switching atm allocation-mode {**optimistic** | **conservative**}

Syntax Description

optimistic	Label binding is returned immediately, and packets are discarded until the downstream setup is complete.
conservative	Label binding is delayed until the label VC has been set up downstream.

Defaults

The default is conservative.

Command Modes

Global configuration

Command History

Release	Modification
11.1 CT	This command was introduced.

Examples

In the following example, the mode for handling binding requests is set to optimistic on a TC-ATM interface:

```
tag-switching atm allocation-mode optimistic
```

tag-switching atm control-vc

The **tag-switching atm control-vc** command is replaced by the **mpls atm control-vc** command. See the **mpls atm control-vc** command for more information.

tag-switching atm cos

To change the value of configured bandwidth allocation for QoS, use the **tag-switching atm cos** xtagatm interface configuration command.

tag-switching atm cos [**available** | **standard** | **premium** | **control**] *weight*

Syntax Description

available	(Optional) Specifies the weight for the **available** class. This is the lowest class priority.
standard	(Optional) Specifies the weight for the **standard** class. This is the next lowest class priority.
premium	(Optional) Specifies the weight for the **premium** class. This is the next highest class priority.
control	(Optional) Specifies the weight for the **control** class. This is the highest class priority.
weight	Specifies the total weight for all QoS traffic classes. This value ranges from 0 to 100.

Defaults

Available 50 percent, control 50 percent

Command Modes

xtagatm interface configuration

Command History

Release	Modifications
12.0(5)T	This command was introduced.

Examples

The following example shows output from this command:

```
tag-switching atm cos
interface XTagATM 0
ip unnumbered loopback0
no ip directed-broadcast
no ip route-cache cef
extended-port ATM1/0 bpx 10.2
tag-switching atm cos available 50
tag-switching atm cos control 50
tag-switching atm vpi 2-5
tag-switching ip
```

tag-switching atm disable-headend-vc

To remove all headend VCs from the MPLS LSC and disable its ability to function as an edge LSR, use the **tag-switching atm disable-headend-vc** command. To restore the headend VCs of the MPLS LSC and restores full edge LSR functionality, use the **no** form of this command.

tag-switching atm disable-headend-vc

no tag-switching atm disable-headend-vc

Syntax Description

This command has no arguments or keywords.

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

Release	Modification
12.0(7)DC	This command was introduced.

Usage Guidelines

The command prevents LSC from initiating headend VCs and hence reduces the number of VCs used in the network. The LSC can still terminate tailend VCs, if required.

Examples

In the following example, the MPLS LSC is disabled from acting like an edge LSR and therefore cannot create headend LVCs.

```
tag-switching atm disable-headend-vc
```

tag-switching atm maxhops

To limit the maximum hop count to a value you have specified, use the **tag-switching atm maxhops** command in global configuration mode. To ignore the hop count, use the **no** form of this command.

tag-switching atm maxhops [*number*]

no tag-switching atm maxhops

Syntax Description

number	(Optional) Maximum hop count.

Defaults

The default is 254.

Command Modes

Global configuration

Command History

Release	Modification
11.1 CT	This command was introduced.

Usage Guidelines

When an ATM-LSR receives a BIND REQUEST, it does not send a BIND back if the value in the request is equal to the maxhops value. Instead, the ATM-LSR or LSR returns an error that specifies that the hop count has been reached.

When an ATM-LSR initiates a request for a label binding, it includes a parameter specifying the maximum number of hops that the request should travel before reaching the edge of the ATM Label Switching region. This is used to prevent forwarding loops in setting up label paths across the ATM region.

Examples

The following example sets the hop count limit to 2:

```
tag-switching atm maxhops 2
```

Related Commands

Command	Description
show isis database verbose	Displays the requested entries from the ATM LDP label binding database.

tag-switching atm multi-vc

To configure a router subinterface to create one or more tag-VCs over which packets of different classes are sent, use the **tag-switching atm multi-vc** command in ATM subinterface configuration submode. To disable this option, use the **no** form of this command.

tag-switching atm multi-vc

no tag-switching atm multi-vc

Syntax Description

This command has no arguments or keywords.

Defaults

No default behavior or values.

Command Modes

ATM subinterface configuration

Command History

Release	Modification
12.0(5)T	This command was introduced.

Usage Guidelines

This option is valid only on ATM MPLS subinterfaces.

Examples

The following commands configure interface a2/0/0.1 on the router for MPLS QoS multi-VC mode:

```
configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
int a2/0/0.1 tag-switching
tag atm multi-vc
exit
exit
```

tag-switching atm vc-merge

To control whether vc-merge (multipoint-to-point) is supported for unicast label VCs, use the **tag-switching atm vc-merge** command in global configuration mode. To disable this feature, use the **no** form of this command.

tag-switching atm vc-merge

no tag-switching atm vc-merge

Syntax Description

This command has no arguments or keywords.

Defaults

The default is enabled if the hardware supports the ATM-VC merge capability.

Command Modes

Global configuration

Command History

Release	Modification
11.1 CT	This command was introduced.

Related Commands

Command	Description
show tag-switching atm-tdp capability	Displays the ATM LDP label capabilities.

tag-switching atm vpi

The **tag-switching atm vpi** command is replaced by the **mpls atm vpi** command. See the **mpls atm vpi** command for more information.

tag-switching atm vp-tunnel

To specify an interface or a subinterface as a VP tunnel, use the **tag-switching atm vp-tunnel** interface configuration command.

tag-switching atm vp-tunnel *vpi*

Syntax Description

vpi	Provides VPI value for the local end of the tunnel.

Defaults

No default behavior or values.

Command Modes

Interface configuration

Command History

Release	Modification
12.0(5)T	This command was introduced.

Usage Guidelines

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

This command is available on both extended MPLS ATM interfaces and on LC-ATM subinterfaces of ordinary router ATM interfaces. The command is not available on the LightStream 1010 device, where all subinterfaces are automatically VP tunnels.

On an XTagATM interface, the tunnel/nontunnel status and the VPI value to be used in case the XTagATM interface is a tunnel are normally learned from the switch through VSI interface discovery. Therefore, it is not necessary to use the **tag-switching atm vp-tunnel** command on an XTagATM interface in most applications.

Examples

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

```
tag-switching atm vp-tunnel 4
```

tag-switching cos-map

To create a class map that specifies how classes map to label VCs when combined with a prefix map, use the **tag-switching cos-map** command in global configuration mode.

tag-switching cos-map *number*

Syntax Description

number	Unique number for a QoS map (from 1 to 255).

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

Release	Modification
12.0(5)T	This command was introduced.

Examples

This example shows how to create a class map:

```
tag-switching cos-map 55
class 1 premium
exit
```

Related Commands

Command	Description
class (MPLS)	Configures an MPLS QoS map that specifies how classes map to LVCs when combined with a prefix map.
show tag-switching cos-map	Displays the QoS map used to assign quantity of LVC and associated QoS of those LVCs.

tag-switching ip (global configuration)

The **tag-switching ip** command is replaced by the **mpls ip** command. See the **mpls ip (global configuration)** command for more information.

tag-switching ip (interface configuration)

The **tag-switching ip** command is replaced by the **mpls ip** command. See the **mpls ip (interface configuration)** command for more information.

tag-switching ip default-route

The **tag-switching ip default-route** command is replaced by the **mpls ip default-route** command. See the **mpls ip default-route** command for more information.

tag-switching mtu

The **tag-switching mtu** command is replaced by the **mpls mtu** command. See the **mpls mtu** command for more information.

tag-switching prefix-map

To configure a router to use a specified QoS map when a label destination prefix matches the specified access list, use the **tag-switching prefix-map** command in ATM subinterface configuration submode.

tag-switching prefix-map *prefix-map* **access-list** *access-list* **cos-map** *cos-map*

Syntax Description

prefix-map	A unique number for a prefix map.
access-list *access list*	A unique number for a simple IP access list.
cos-map *cos-map*	A unique number for a CoS map.

Defaults

No default behavior or values.

Command Modes

ATM subinterface configuration

Command History

Release	Modification
12.0(5)T	This command was introduced.

Usage Guidelines

This is a global command used to link an access list to a QoS map.

Examples

The following example links an access list to a QoS map:

```
tag-switching prefix-map 55 access-list 55 cos-map 55
```

Related Commands

Command	Description
show tag prefix-map	Displays the prefix map used to assign a QoS map to network prefixes matching a standard IP access list.

tag-switching request-tags for

To restrict the creation of LVCs through the use of access lists on the LSC or label edge router, use the **tag-switching request-tags for** global configuration command. To disable this feature, use the **no** form of this command.

tag-switching request-tags for *access-list*

no tag-switching request-tags for

Syntax Description

access-list	A named or numbered standard IP access list.

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

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

Usage Guidelines

The command includes the following usage guidelines:

- You can specify either an access list number or name.
- When creating an access list, the end of the access list contains an implicit deny statement for everything if it did not find a match before reaching the end.
- If you omit the mask from an IP host address access list specification, 0.0.0.0 is assumed to be the mask.

Examples

In the following example, headend LVCs are prevented from being established from the LSC to all 198.x.x.x destinations. The following commands are added to the LSC configuration:

```
tag-switching request-tags for 1
access-list 1 deny 198.0.0.0 0.255.255.255
access-list 1 permit any
```

Related Commands

Command	Description
access list	Creates access lists.
ip access-list	Permits or denies access to IP addresses.

tag-switching tag-range downstream

The **tag-switching tag-range** command is replaced by the **mpls label range** command. See the **mpls label range** command for more information.

tag-switching tdp discovery

To configure the interval between transmission of LDP (TDP) discovery hello messages, or the hold time for a LDP transport connection, use the **tag-switching tdp discovery** command in global configuration mode.

tag-switching tdp discovery {**hello** | **directed hello**} {**holdtime** | **interval**} *seconds*

Syntax Description

hello	Configures the intervals and hold times for directly connected neighbors.
directed-hello	Configures the intervals and hold times for neighbors that are not directly connected (for example, LDP sessions that run through a LSP tunnel).
holdtime	The interval for which a connection stays up if no hello messages are received. The default is 15 seconds.
interval	The period between the sending of consecutive hello messages. The default is 5 seconds.
seconds	The hold time or interval.

Defaults

holdtime: 15 seconds
interval: 5 seconds

Command Modes

Global configuration

Command History

Release	Modification
11.1 CT	This command was introduced.

Examples

In the following example, the interval for which a connection stays up if no hello messages are received is set to 5 seconds:

```
tag-switching tdp discovery hello holdtime 5
```

Related Commands

Command	Description
show tag-switching tdp parameters	Displays available LDP parameters.
tag-switching tdp holdtime	Enables LSP tunnel functionality on a device.

tag-switching tdp holdtime

To enable LSP tunnel functionality on a device, use the **tag-switching tdp holdtime** command in global configuration mode.

tag-switching tdp holdtime *seconds*

Syntax Description

seconds	The time for which an LDP session is maintained in the absence of LDP messages from the session peer device.

Defaults

15 seconds

Command Modes

Global configuration

Command History

Release	Modification
11.1 CT	This command was introduced.

Usage Guidelines

When an LDP session is initiated, the hold time is set to the lower of the values configured at the two ends.

Examples

In the following example, the hold time of LDP sessions is configured for 30 seconds:

```
tag-switching tdp holdtime 30
```

Related Commands

Command	Description
show tag-switching tdp parameters	Displays available LDP parameters.
tag-switching tdp discovery	Configures the interval between transmission of LDP discovery hello messages.

tag-switching tsp-tunnels (global configuration)

The **tag-switching tsp-tunnels** command is replaced by the **mpls traffic-eng tunnels** command. See the **mpls traffic-eng tunnels (global)** command for more information.

tag-switching tsp-tunnels (interface configuration)

The **tag-switching tsp-tunnels** command is replaced by the **mpls traffic-eng tunnels** command. See the **mpls traffic-eng tunnels (interface)** command for more information.

tunnel flow egress-records

To create a NetFlow record for packets that are encapsulated by a generic routing encapsulation (GRE) tunnel when both NetFlow and CEF are enabled, use the **tunnel flow egress-records** command in interface configuration mode. To disable NetFlow record creation, use the **no** form of this command.

tunnel flow egress-records

no tunnel flow egress-records

Syntax Description

This command has no arguments or keywords.

Defaults

A NetFlow record for encapsulated packets is not created.

Command Modes

Interface configuration

Command History

Release	Modification
12.2(2)T	This command was introduced.

Usage Guidelines

When this command is enabled on a GRE tunnel with both Cisco Express Forwarding (CEF) and NetFlow enabled, a NetFlow record is created for packets that are encapsulated by the tunnel.

Examples

The following example enables NetFlow record creation:

```
tunnel flow egress records
```

Related Commands

Command	Description
show ip cache flow	Displays NetFlow switching statistics.

tunnel mode mpls traffic-eng

To set the mode of a tunnel to MPLS for traffic engineering, use the **tunnel mode mpls traffic-eng** interface configuration command. To disable this feature, use the **no** form of this command.

tunnel mode mpls traffic-eng

no tunnel mode mpls traffic-eng

Syntax Description

This command has no arguments or keywords.

Defaults

No default behavior or values.

Command Modes

Interface configuration

Command History

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

Usage Guidelines

This command specifies that the tunnel interface is for an MPLS traffic engineering tunnel and enables the various tunnel MPLS configuration options.

Examples

In the following example, the mode of the tunnel is set to MPLS traffic engineering:

```
Router(config-if)# tunnel mode mpls traffic-eng
```

Related Commands

Command	Description
tunnel mpls traffic-eng affinity	Configures an affinity for an MPLS traffic engineering tunnel.
tunnel mpls traffic-eng autoroute announce	Instructs the IGP to use the tunnel in its enhanced SPF calculation (if the tunnel is up).
tunnel mpls traffic-eng bandwidth	Configures the bandwidth required for an MPLS traffic engineering tunnel.
tunnel mpls traffic-eng path-option	Configures a path option.
tunnel mpls traffic-eng priority	Configures setup and reservation priority for an MPLS traffic engineering tunnel.

tunnel mode tag-switching

The **tunnel mode tag-switching** command is replaced by the **tunnel mode mpls traffic-eng** command. See the **tunnel mode mpls traffic-eng** command for more information.

tunnel mpls traffic-eng affinity

To configure an affinity (the properties the tunnel requires in its links) for an MPLS traffic engineering tunnel, use the **tunnel mpls traffic-eng affinity** interface configuration command. To disable this feature, use the **no** form of this command.

tunnel mpls traffic-eng affinity *properties* [**mask** *mask value*]

no tunnel mpls traffic-eng affinity *properties* [**mask** *mask value*]

Syntax Description

properties	Attribute values required for links carrying this tunnel. A 32-bit decimal number. Valid values are from 0x0 to 0xFFFFFFFF, representing 32 attributes (bits), where the value of an attribute is 0 or 1.
mask *mask value*	(Optional) Link attribute to be checked. A 32-bit decimal number. Valid values are from 0x0 to 0xFFFFFFFF, representing 32 attributes (bits), where the value of an attribute is 0 or 1.

Defaults

properties: 0X00000000
mask value: 0X0000FFFF

Command Modes

Interface configuration

Command History

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

Usage Guidelines

The affinity determines the attributes of the links that this tunnel will use (that is, the attributes for which the tunnel has an affinity). The attribute mask determines which link attribute the router should check. If a bit in the mask is 0, an attribute value of a link or that bit is irrelevant. If a bit in the mask is 1, the attribute value of a link and the required affinity of the tunnel for that bit must match.

A tunnel can use a link if the tunnel affinity equals the link attributes and the tunnel affinity mask.

Any properties set to 1 in the affinity should also be 1 in the mask. In other words, affinity and mask should be set as follows:

```
tunnel_affinity = (tunnel_affinity and tunnel_affinity_mask)
```

Examples

In the following example, the affinity of the tunnel is set to 0x0101 mask 0x303:

```
Router(config-if)# tunnel mpls traffic-eng affinity 0x0101 mask 0x303
```

Related Commands

Command	Description
mpls traffic-eng attribute-flags	Sets the attributes for the interface.
tunnel mode mpls traffic-eng	Sets the mode of a tunnel to MPLS for traffic engineering.

tunnel mpls traffic-eng autoroute announce

To specify that the IGP should use the tunnel (if the tunnel is up) in its enhanced shortest path first (SPF) calculation, use the **tunnel mpls traffic-eng autoroute announce** interface configuration command. To disable this feature, use the **no** form of this command.

tunnel mpls traffic-eng autoroute announce

no tunnel mpls traffic-eng autoroute announce

Syntax Description

This command has no arguments or keywords.

Defaults

The IGP does not use the tunnel in its enhanced SPF calculation.

Command Modes

Interface configuration

Command History

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

Usage Guidelines

Currently, the only way to forward traffic onto a tunnel is by enabling this feature or by explicitly configuring forwarding (for example, with an interface static route).

Examples

In the following example, the instruction is given that if this tunnel is up, the IGP should use the tunnel in its enhanced SPF calculation:

```
Router(config-if)# tunnel mpls traffic-eng autoroute announce
```

In the following example, the instruction is given that if the IGP is using this tunnel in its enhanced SPF calculation, the IGP should give it an absolute metric of 10:

```
Router(config-if)# tunnel mpls traffic-eng autoroute announce metric absolute 10
```

In the following example, the tunnel requires 100 kBps of bandwidth:

```
Router(config-if)# tunnel mpls traffic-eng bandwidth 100
```

Related Commands

Command	Description
ip route	Establishes static routes.
tunnel mode mpls traffic-eng	Sets the mode of a tunnel to MPLS for traffic engineering.

tunnel mpls traffic-eng autoroute metric

To specify the MPLS traffic engineering tunnel metric that the IGP enhanced SPF calculation uses, use the **tunnel mpls traffic-eng autoroute metric** interface configuration command. To disable this feature, use the **no** form of this command.

tunnel mpls traffic-eng autoroute metric {**absolute** | **relative**} *value*

no tunnel mpls traffic-eng autoroute metric

Syntax Description

absolute	Absolute metric mode; you can enter a positive metric value.
relative	Relative metric mode; you can enter a positive, negative, or zero value.
value	The metric that the IGP enhanced SPF calculation uses. The **relative** value can be from –10 to 10.

Note Even though the value for a relative metric can be from -10 to 10, configuring a tunnel metric with a negative value is considered a misconfiguration. If from the routing table the metric to the tunnel tail appears to be 4, then the cost to the tunnel tail router is actually 3 because 1 is added to the cost for getting to the loopback address. In this instance, the lowest value that you can configure for the relative metric is -3.

Defaults

The default is metric relative 0.

Command Modes

Interface configuration

Command History

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

Usage Guidelines

If you enter a relative value that causes the tunnel metric to be a negative number, the configuration is invalid.

Examples

The following example designates that the IGP enhanced SPF calculation will use MPLS traffic engineering tunnel metric negative 1:

```
Router(config-if)# tunnel mpls traffic-eng autoroute metric relative -1
```

Related Commands

Command	Description
show mpls traffic-eng autoroute	Displays the tunnels announced to IGP, including interface, destination, and bandwidth.
tunnel mpls traffic-eng autoroute announce	Instructs the IGP to use the tunnel (if it is up) in its enhanced SPF calculation.

tunnel mpls traffic-eng bandwidth

To configure the bandwidth required for an MPLS traffic engineering tunnel, use the **tunnel mpls traffic-eng bandwidth** interface configuration command. To disable this feature, use the **no** form of this command.

tunnel mpls traffic-eng bandwidth *bandwidth*

no tunnel mpls traffic-eng bandwidth *bandwidth*

Syntax Description

bandwidth	The bandwidth required for an MPLS traffic engineering tunnel. Bandwidth is specified in kBps.

Defaults

Default bandwidth is 0.

Command Modes

Interface configuration

Command History

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

Examples

In the following example, the bandwidth required for an MPLS traffic engineering tunnel is 1000:

```
Router(config-if)# tunnel mpls traffic-eng bandwidth 1000 1Xwn
```

Related Commands

Command	Description
show mpls traffic-eng tunnels	Displays tunnel information.

tunnel mpls traffic-eng load-share

To determine load-sharing among two or more Multiprotocol Label Switching (MPLS) traffic engineering (TE) tunnels that begin at the same router and go to an identical destination, use the **tunnel mpls traffic-eng load-share** command in interface configuration mode. To disable this feature, use the **no** form of this command.

tunnel mpls traffic-eng load-share *value*

no tunnel mpls traffic-eng load-share *value*

Syntax Description

value	A value from which the head-end router will calculate the proportion of traffic to be sent down each of the parallel tunnels. Range is between 1 and 1000000.

Defaults

No default behavior or values.

Command Modes

Interface configuration

Command History

Release	Modification
12.1(3)T	This command was introduced.

Usage Guidelines

Each parallel tunnel must be configured with this command. Specify a value to indicate the *proportion* of total traffic you want to be allocated into each individual tunnel. For example, if there are to be three parallel tunnels, and you want Tunnel1 to carry half of the traffic and the other two tunnels to carry one-quarter, you should enter the following values:

- Tunnel1 -- 2
- Tunnel2 -- 1
- Tunnel3 -- 1

The ability to divide bandwidth in unequal amounts across traffic engineering tunnels has a finite granularity. This granularity varies by platform, with both hardware and software limits. If load-sharing is configured so that it exceeds the available granularity, the following message is displayed:

```
@FIB-4-UNEQUAL: Range of unequal path weightings too large for prefix x.x.x.x/y. Some
available paths may not be used.
```

To eliminate this message, it is recommended that you change the requested bandwidth or load-share.

Examples

In the following example, three tunnels are configured, with the first tunnel receiving half of the traffic and the other two tunnels receiving one-quarter:

```
interface Tunnel1
    ip unnumbered Loopback0
    no ip directed-broadcast
    tunnel destination 41.41.41.41
    tunnel mode mpls traffic-eng
    tunnel mpls traffic-eng path-option 10 dynamic
    tunnel mpls traffic-eng load-share 2

interface Tunnel2
    ip unnumbered Loopback0
    no ip directed-broadcast
    tunnel destination 41.41.41.41
    tunnel mode mpls traffic-eng
    tunnel mpls traffic-eng path-option 10 dynamic
    tunnel mpls traffic-eng load-share 1

interface Tunnel3
    ip unnumbered Loopback0
    no ip directed-broadcast
    tunnel destination 41.41.41.41
    tunnel mode mpls traffic-eng
    tunnel mpls traffic-eng path-option 10 dynamic
    tunnel mpls traffic-eng load-share 1
```

Related Commands

Command	Description
show ip route	Displays routing table information about tunnels, including their traffic share.
tunnel mpls traffic-eng bandwidth	Configures bandwidth in Kbps for an MPLS traffic engineering tunnel.

tunnel mpls traffic-eng path-option

To configure a path option for an MPLS traffic engineering tunnel, use the **tunnel mpls traffic-eng path-option** interface configuration command. To disable this feature, use the **no** form of this command.

tunnel mpls traffic-eng path-option *number* {**dynamic** | **explicit** {**name** *path-name* | *path-number*}} [**lockdown**]

no tunnel mpls traffic-eng path-option *number* {**dynamic** | **explicit** {**name** *path-name* | *path-number*}} [**lockdown**]

Syntax Description

number	When multiple path options are configured, lower numbered options are preferred.
dynamic	Path of the LSP is dynamically calculated.
explicit	Path of the LSP is an IP explicit path.
name *path-name*	Path name of the IP explicit path that the tunnel uses with this option.
path-number	Path number of the IP explicit path that the tunnel uses with this option.
lockdown	(Optional) The LSP cannot be reoptimized.

Defaults

No default behavior or values.

Command Modes

Interface configuration

Command History

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

Usage Guidelines

You can configure multiple path options for a single tunnel. For example, there can be several explicit path options and a dynamic option for one tunnel. Path setup preference is for lower (not higher) numbers, so option 1 is preferred.

Examples

In the following example, the tunnel is configured to use a named IP explicit path:

```
Router(config-if)# tunnel mpls traffic-eng path-option 1 explicit name test
```

Related Commands

Command	Description
ip explicit-path	Enters the subcommand mode for IP explicit paths and creates or modifies the specified path.
show ip explicit-paths	Displays the configured IP explicit paths.
tunnel mpls traffic-eng priority	Configures the setup and reservation priority for an MPLS traffic engineering tunnel.

tunnel mpls traffic-eng path-selection metric

To specify the metric type to use for path calculation for a tunnel, use the **tunnel mpls traffic-eng path-selection metric** command in interface configuration mode. To remove the specified metric type, use the **no** form of this command.

tunnel mpls traffic-eng path-selection metric {**igp** | **te**}

no tunnel mpls traffic-eng path-selection metric

Syntax Description

igp	Use the Interior Gateway Protocol (IGP) metric.
te	Use the traffic engineering (TE) metric.

Defaults

The default is the **te** metric.

Command Modes

Interface configuration

Command History

Release	Modification
12.0(18)ST	This command was introduced.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

The metric type to be used for path calculation for a given tunnel is determined as follows:

- If the **tunnel mpls traffic-eng path-selection metric** command was entered to specify a metric type for the tunnel, use that metric type.
- Otherwise, if the **mpls traffic-eng path-selection metric** was entered to specify a metric type, use that metric type.
- Otherwise, use the default (**te**) metric.

Examples

The following commands specify that the igp metric should be used when you are calculating the path for Tunnel102:

```
Router(config)# interface tunnel102
Router(config-if)# tunnel mpls traffic-eng path-selection metric igp
```

Related Commands

Command	Description
mpls traffic-eng path-selection metric	Specifies the metric type to use for path calculation for TE tunnels for which no metric has been explicitly configured.

tunnel mpls traffic-eng priority

To configure the setup and reservation priority for an MPLS traffic engineering tunnel, use the **tunnel mpls traffic-eng priority** interface configuration command. To disable this feature, use the **no** form of this command.

tunnel mpls traffic-eng priority *setup-priority* [*hold-priority*]

no tunnel mpls traffic-eng priority *setup-priority* [*hold-priority*]

Syntax Description

setup-priority	The priority used when signalling an LSP for this tunnel to determine which existing tunnels can be preempted. Valid values are from 0 to 7, where a lower number indicates a higher priority. Therefore, an LSP with a setup priority of 0 can preempt any LSP with a non-0 priority.
hold-priority	(Optional) The priority associated with an LSP for this tunnel to determine if it should be preempted by other LSPs that are being signalled. Valid values are from 0 to 7, where a lower number indicates a higher priority.

Defaults

setup-priority: 7
hold-priority: The same value as the *setup-priority*

Command Modes

Interface configuration

Command History

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

Usage Guidelines

When an LSP is being signaled and an interface does not currently have enough bandwidth available for that LSP, the call admission software preempts lower-priority LSPs so that the new LSP can be admitted. (LSPs are preempted if that allows the new LSP to be admitted.)

In the described determination, the new LSP's priority is its setup priority and the existing LSP's priority is its hold priority. The two priorities make it possible to signal an LSP with a low setup priority (so that the LSP does not preempt other LSPs on setup) but a high hold priority (so that the LSP is not preempted after it is established).

Setup priority and hold priority are typically configured to be equal, and setup priority cannot be better (numerically smaller) than the hold priority.

Examples

In the following example, a tunnel is configured with a setup and hold priority of 1:

```
Router(config-if)# tunnel mpls traffic-eng priority 1
```

Related Commands

Command	Description
tunnel mode mpls traffic-eng	Sets the mode of a tunnel to MPLS for traffic engineering.

tunnel tsp-hop

To define hops in the path for the label switching tunnel, use the **tunnel tsp-hop** command in interface configuration mode. To remove these hops, use the **no** form of this command.

tunnel tsp-hop *hop-number ip-address* [**lasthop**]

no tunnel tsp-hop *hop-number ip-address* [**lasthop**]

Syntax Description

hop-number	The sequence number of the hop being defined in the path. The first number is 1, which identifies the hop just after the head hop.
ip-address	The IP address of the input interface on that hop.
lasthop	(Optional) Indicates that the hop being defined is the final hop in the path (the tunnel destination).

Defaults

No hops are defined.

Command Modes

Interface configuration

Command History

Release	Modification
11.1 CT	This command was introduced.

Usage Guidelines

The list of tunnel hops must specify a strict source route for the tunnel. In other words, the router at hop <*n*> must be directly connected to the router at hop <*n*>+1.

Examples

The following example shows the configuration of a two-hop tunnel. The first hop router/switch is 82.0.0.2, and the second and last hop is router/switch 81.0.0.2.

```
interface tunnel 5

tunnel mode tag-switching
ip unnumbered e0/1
  tunnel tsp-hop 1 82.0.0.2
  tunnel tsp-hop 2 81.0.0.2 lasthop
```

Related Commands

Command	Description
tunnel mode mpls traffic-eng	Sets the encapsulation mode of the tunnel to label switching.