

show mpls atm-ldp bindings

To display the requested entries from the ATM label distribution protocol (LDP) label bindings database, use the **show mpls atm-ldp bindings** command in EXEC mode.

```
show mpls atm-ldp bindings [A.B.C.D {mask | length}]
    [local-label vpi vci] [remote-label vpi vci] [neighbor atm slot/subslot/port] [vc-merged]
    [path]
```

Syntax Description	
<i>A.B.C.D</i>	(Optional) Destination of prefix.
<i>mask</i>	(Optional) Destination netmask prefix.
<i>length</i>	(Optional) Netmask length, in the range from 1 to 32.
local-label <i>vpi vci</i>	(Optional) Matches locally assigned label values. (VPI range is 0 to 4095. VCI range is 0 to 65535.)
remote-label <i>vpi vci</i>	(Optional) Matches remotely assigned label values. (VPI range is 0 to 4095. VCI range is 0 to 65535.)
neighbor atm <i>slot/subslot/port</i>	(Optional) Matches labels assigned by a neighbor on the specified ATM interface.
vc-merged	(Optional) Lists the merged VCs.
path	(Optional) Displays the path of an LVC, from source to destination.

Defaults Displays all database entries.

Command Modes EXEC

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.
	12.2(8)T	This command was modified to include the vc-merged keyword.
	12.3(2)T6	This command was modified to include the path keyword.
	12.3(9)	This command was integrated into 12.3(9).

Usage Guidelines The display output can show the entire database or a subset of entries based on the prefix, the VC label value, or an assigning interface.

Examples

The following is sample output from the **show mpls atm-ldp bindings** command:

```
Router# show mpls atm-ldp bindings

Destination: 10.13.13.6/32
  Headend Router ATM1/0.1 (2 hops) 1/33 Active, VCD=8, CoS=available
  Headend Router ATM1/0.1 (2 hops) 1/34 Active, VCD=9, CoS=standard
  Headend Router ATM1/0.1 (2 hops) 1/35 Active, VCD=10, CoS=premium
  Headend Router ATM1/0.1 (2 hops) 1/36 Active, VCD=11, CoS=control

Destination: 192.168.0.0/8
  Headend Router ATM1/0.1 (1 hop) 1/37 Active, VCD=4, CoS=available
  Headend Router ATM1/0.1 (1 hop) 1/34 Active, VCD=5, CoS=standard
  Headend Router ATM1/0.1 (1 hop) 1/35 Active, VCD=6, CoS=premium
  Headend Router ATM1/0.1 (1 hop) 1/36 Active, VCD=7, CoS=control

Destination: 10.0.0.18/32
  Tailend Router ATM1/0.1 1/33 Active, VCD=8
```

The following is sample output from the **show mpls atm-ldp bindings** command with the **path** keyword:

```
Router# show mpls atm-ldp bindings 10.0.2.115 32 path

Destination: 10.0.2.115/32
  Headend Router Switch1.1 (2 hops) 0/39 Active, VCD=9, CoS=available
    Path: 10.0.2.102* 10.0.3.42 10.0.2.115
  Headend Router Switch1.1 (2 hops) 0/41 Active, VCD=8, CoS=premium
    Path: 10.0.2.102* 10.0.3.42 10.0.2.115
  Headend Router Switch1.1 (2 hops) 0/43 Active, VCD=7, CoS=control
    Path: 10.0.2.102* 10.0.3.42 10.0.2.115
```

[Table 77](#) describes the significant fields shown in the display.

Table 77 *show mpls atm-ldp bindings Field Descriptions*

Field	Description
Destination:	Destination IP address/length of netmask.
Headend Router	VC type: <ul style="list-style-type: none"> • Headend—VC that originates at this router • Tailend—VC that terminates at this router • Transit—VC that passes through this router
ATM1/0.1	ATM interface.
1/33	VPI/VCI
Active	LVC state: <ul style="list-style-type: none"> • Active—Set up and working • Bindwait—Waiting for response
VCD=	Virtual circuit descriptor number.

Table 77 *show mpls atm-ldp bindings Field Descriptions (continued)*

Field	Description
CoS=	Label virtual circuit type for class of service categories: <ul style="list-style-type: none"> • Available—CoS = 0 • Standard—CoS = 1 • Premium—CoS = 2 • Control—CoS = 3
Path	The path of the LVC. The asterisk (*) next to the first prefix indicates that the command was issued from that router. This output displays when you issue the path keyword.

Related Commands

Command	Description
show mpls atm-ldp bindwait	Displays the number of bindings waiting for label assignments for a remote MPLS ATM switch.

show mpls atm-ldp bindwait

To display the number of bindings waiting for label assignments from a remote Multiprotocol Label Switching (MPLS) ATM switch, use the **show mpls atm-ldp bindwait** command in user EXEC or privileged EXEC mode.

show mpls atm-ldp bindwait

Syntax Description This command has no arguments or keywords.

Command Modes User EXEC
Privileged EXEC

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.

Examples The following is a sample display using this command:

```
Router# show mpls atm-ldp bindwait
```

If everything is working properly, this command does not display any output.

Related Commands	Command	Description
	show mpls atm-ldp bindings	Displays requested entries from the ATM LDP label binding database.

show mpls atm-ldp capability

To display the Multiprotocol Label Switching (MPLS) ATM capabilities negotiated with Label Distribution Protocol (LDP) neighbors for label-controlled ATM (LC-ATM) interfaces, use the **show mpls atm-ldp capability** command in privileged EXEC mode.

show mpls atm-ldp capability

Syntax Description This command has no arguments or keywords.

Command Modes Privileged EXEC

Command History	Release	Modification
	11.1CT	This command was introduced.
	12.0(10)ST	This command was modified to reflect Multiprotocol Label Switching (MPLS) Internet Engineering Task Force (IETF) command syntax and terminology.
	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 When two label switch routers (LSRs) establish an LDP session, they negotiate parameters for the session, such as the range of virtual path identifiers (VPIs) and virtual channel identifiers (VCIs) that will be used as labels.

This command displays the MPLS ATM capabilities negotiated by LDP or the Tag Distribution Protocol (TDP).

Examples The following is sample output from the **show mpls atm-ldp capability** command:

```
Router# show mpls atm-ldp capability

ATM0/1/0          VPI          VCI          Alloc  Odd/Even  VC Merge
                  Range        Range        Scheme Scheme    IN   OUT
  Negotiated    [100 - 101]  [33 - 1023]  UNIDIR          -   -
  Local         [100 - 101]  [33 - 16383] UNIDIR          EN  EN
  Peer         [100 - 101]  [33 - 1023]  UNIDIR          -   -

ATM0/1/1          VPI          VCI          Alloc  Odd/Even  VC Merge
                  Range        Range        Scheme Scheme    IN   OUT
  Negotiated    [201 - 202]  [33 - 1023]  BIDIR          -   -
  Local         [201 - 202]  [33 - 16383] UNIDIR  ODD          NO  NO
  Peer         [201 - 202]  [33 - 1023]  BIDIR  EVEN          -   -
```

Table 78 describes the fields shown in the display.

Table 78 show mpls atm-ldp capability Field Descriptions

Field	Description
VPI Range	Minimum and maximum numbers of VPIs supported on this interface.
VCI Range	Minimum and maximum numbers of VCIs supported on this interface.
Alloc Scheme	<p>Indicates the applicable allocation scheme, as follows:</p> <ul style="list-style-type: none"> • UNIDIR—Unidirectional capability indicates that the peer can, within a single VPI, support binding of the same VCI to different prefixes on different directions of the link. • BIDIR—Bidirectional capability indicates that within a single VPI, a single VCI can appear in one binding only. In this case, one peer allocates bindings in the even VCI space, and the other in the odd VCI space. The system with the lower LDP identifier assigns even-numbered VCIs. <p>The negotiated allocation scheme is UNIDIR, only if, both peers have UNIDIR capability. Otherwise, the allocation scheme is BIDIR.</p> <p>Note These definitions for <i>unidirectional</i> and <i>bidirectional</i> are consistent with normal ATM usage of the terms; however, they are exactly opposite from the definitions for them in the IETF LDP specification.</p>
Odd/Even Scheme	Indicates whether the local device or the peer is assigning an odd- or even-numbered VCI when the negotiated scheme is BIDIR. It does not display any information when the negotiated scheme is UNIDIR.
VC Merge	<p>Indicates the type of virtual circuit merge support available on this interface. There are two possibilities, as follows:</p> <p>IN—Indicates the input interface merge capability. IN displays the following values:</p> <ul style="list-style-type: none"> • EN—The hardware interface supports virtual circuit merge, and virtual circuit merge is enabled on the device. • DIS—The hardware interface supports virtual circuit merge and virtual circuit merge is disabled on the device. • NO—The hardware interface does not support virtual circuit merge. <p>OUT—Indicates the output interface merge capability. OUT displays the same values as the input merge side.</p> <p>The virtual circuit merge capability is meaningful only on ATM switches. This capability is not negotiated.</p>
Negotiated	Indicates the set of options that both LDP peers have agreed to share on this interface. For example, the VPI or VCI allocation on either peer remains within the negotiated range.
Local	Indicates the options supported locally on this interface.
Peer	Indicates the options supported by the remote LDP peer on this interface.

Related Commands

Command	Description
mpls ldp atm vc-merge	Controls whether ATM-virtual circuit merge (multipoint-to-point) is supported for unicast label virtual circuits.

show mpls atm-ldp summary

To display summary information about all the entries in the ATM label binding database, use the **show mpls atm-ldp summary** command in privileged EXEC mode.

show mpls atm-ldp summary

Syntax Description This command has no arguments or keywords.

Defaults This command has no default behavior or values.

Command Modes Privileged EXEC

Command History	Release	Modification
	11.1CT	This command was introduced.
	12.0(10)ST	This command was modified to reflect MPLS IETF command syntax and terminology.
	12.2(2)T	This command was integrated into Cisco IOS Release 12.2(2)T.
	12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.

Usage Guidelines Use this command to display dynamic ATM accounting information.

Examples The following shows sample output from the **show mpls atm-ldp summary** command:

```
Router# show mpls atm-ldp summary

Total number of destinations: 406

ATM label bindings summary
interface      total  active  local  remote  Bwait  Rwait  IFwait
ATM0/0/0      406   406    404    2       0      0      0
ATM0/0/1      406   406    3      403    0      0      0
```

[Table 79](#) describes the significant fields shown in the display.

Table 79 *show mpls atm-ldp summary Field Descriptions*

Field	Description
Total number of destinations	Number of destination address prefixes in the LC-ATM database.
interface	Name of an interface with associated ATM label bindings.
total	Total number of ATM labels on this interface.

Table 79 *show mpls atm-ldp summary Field Descriptions (continued)*

Field	Description
active	Number of ATM labels in an “active” state that are ready to use for data transfer.
local	Number of ATM labels on this interface assigned by this label-switch router (LSR).
remote	Number of ATM labels on this interface assigned by the neighbor LSR.
Bwait	Number of bindings that are waiting for a label assignment from the downstream neighbor LSR.
Rwait	Number of bindings that are waiting for resources (VPI/VCI space) to be available on the downstream device.
IFwait	Number of bindings that are waiting for learned labels to be installed for switching use. For an ATM label switch router, this value is 0.

Related Commands

Command	Description
show mpls atm-ldp bindings	Displays the requested entries from the ATM LDP label binding database.

show mpls cos-map

To display the quality of service (QoS) map used to assign a quantity of label virtual circuits and the associated class of service (CoS) for those virtual circuits, use the **show mpls cos-map** command in privileged EXEC mode.

```
show mpls cos-map [cos-map]
```

Syntax Description

cos-map (Optional) Number specifying the QoS map to be displayed.

Command Modes

Privileged EXEC

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

Not entering a specific QoS number causes all QoS maps to be displayed.

Examples

The following is sample output from the **show mpls cos-map** command:

```
Router# show mpls cos-map 2

cos-map 2      class  tag-VC
              3      control
              2      control
              1      available
              0      available
```

[Table 80](#) describes the fields shown in the display.

Table 80 *show mpls cos-map* Field Descriptions

Field	Description
cos-map	Configures a class map, which specifies how classes map to MPLS virtual circuits when they are combined with a prefix map.
class	The IP precedence.
tag-VC	An ATM virtual circuit that is set up through ATM label switch router (LSR) label distribution procedures.

Related Commands

Command	Description
mpls cos-map	Creates a class map specifying how classes map to label virtual circuits when they are combined with a prefix map.

show mpls forwarding-table

To display the contents of the Multiprotocol Label Switching (MPLS) label forwarding information base (LFIB), use the **show mpls forwarding-table** command in privileged EXEC mode.

```
show mpls forwarding-table [network {mask | length} | labels label [- label] | interface interface
| next-hop address | lsp-tunnel [tunnel-id]] [vrf vrf-name] [detail]
```

Syntax Description

<i>network</i>	(Optional) Destination network number.
<i>mask</i>	(Optional) IP address of the destination mask whose entry is to be shown.
<i>length</i>	(Optional) Number of bits in mask of destination.
labels <i>label - label</i>	(Optional) Displays only entries with the specified local labels.
interface <i>interface</i>	(Optional) Displays only entries with the specified outgoing interface.
next-hop <i>address</i>	(Optional) Displays only entries with the specified neighbor as the next hop.
lsp-tunnel <i>tunnel-id</i>	(Optional) Displays only entries with the specified label switched path (LSP) tunnel, or with all LSP tunnel entries.
vrf <i>vrf-name</i>	(Optional) Displays only entries with the specified VPN routing/forwarding instance (VRF).
detail	(Optional) Displays information in long form (includes length of encapsulation, length of MAC string, maximum transmission unit (MTU), and all labels).

Command Modes

Privileged EXEC

Command History

Release	Modification
11.1 CT	This command was introduced.
12.1(3)T	This command was modified to reflect new MPLS Internet Engineering Task Force (IETF) terminology and command-line interface (CLI) command syntax.
12.2(8)T	The command was modified to accommodate use of the MPLS experimental (EXP) level as a selection criteria for packet forwarding. The output display was modified to include a bundle adjacency field and exp (vcd) values when the optional detail keyword is specified.
12.0(22)S	IPv6 MPLS aggregate label and prefix information was added to the display.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.

Usage Guidelines

The options described allow specification of a subset of the entire LFIB.

Examples

The following is sample output from the **show mpls forwarding-table** command:

```
Router# show mpls forwarding-table
```

Local tag	Outgoing tag or VC	Prefix or Tunnel Id	Bytes switched	tag	Outgoing interface	Next Hop
26	Untagged	10.253.0.0/16	0		Et4/0/0	172.27.32.4
28	1/33	10.15.0.0/16	0		AT0/0.1	point2point
29	Pop tag	10.91.0.0/16	0		Hs5/0	point2point
	1/36	10.91.0.0/16	0		AT0/0.1	point2point
30	32	10.250.0.97/32	0		Et4/0/2	10.92.0.7
	32	10.250.0.97/32	0		Hs5/0	point2point
34	26	10.77.0.0/24	0		Et4/0/2	10.92.0.7
	26	10.77.0.0/24	0		Hs5/0	point2point
35	Untagged [T]	10.100.100.101/32	0		Tu301	point2point
36	Pop tag	168.1.0.0/16	0		Hs5/0	point2point
	1/37	168.1.0.0/16	0		AT0/0.1	point2point

[T] Forwarding through a TSP tunnel.
View additional tagging info with the 'detail' option

The following is sample output from the **show mpls forwarding-table** command when the IPv6 Provider Edge Router over MPLS feature is configured to allow IPv6 traffic to be transported across an IPv4 MPLS backbone. The labels are aggregate because there are several prefixes for one local label, and the prefix column contains "IPv6" instead of a target prefix.

```
Router# show mpls forwarding-table
```

Local tag	Outgoing tag or VC	Prefix or Tunnel Id	Bytes switched	tag	Outgoing interface	Next Hop
16	Aggregate	IPv6	0			
17	Aggregate	IPv6	0			
18	Aggregate	IPv6	0			
19	Pop tag	192.168.99.64/30	0		Se0/0	point2point
20	Pop tag	192.168.99.70/32	0		Se0/0	point2point
21	Pop tag	192.168.99.200/32	0		Se0/0	point2point
22	Aggregate	IPv6	5424			
23	Aggregate	IPv6	3576			
24	Aggregate	IPv6	2600			

The following is sample output from the **show mpls forwarding-table** command when you specify the **detail** keyword. If the MPLS EXP level is used as a selection criterion for packet forwarding, a Bundle adjacency exp (vcd) field is included in the display. This field includes the EXP value and the corresponding virtual circuit descriptor (VCD) in parentheses:

```
Router# show mpls forwarding-table detail
```

Local tag	Outgoing tag or VC	Prefix or Tunnel Id	Bytes switched	tag	Outgoing interface	Next Hop
16	Pop tag	1.0.0.6/32	0		AT1/0.1	point2point
	Bundle adjacency exp(vcd)					
	0(1) 1(1) 2(1) 3(1) 4(1) 5(1) 6(1) 7(1)					
	MAC/Encaps=12/12, MTU=4474, Tag Stack{}					
	00010000AAAA030000008847					
	No output feature configured					
17	18	1.0.0.9/32	0		AT1/0.1	point2point
	Bundle adjacency exp(vcd)					
	0(1) 1(1) 2(1) 3(1) 4(1) 5(1) 6(1) 7(1)					
	MAC/Encaps=12/16, MTU=4470, Tag Stack{18}					
	00010000AAAA030000008847 00012000					
	No output feature configured					
18	19	1.0.0.10/32	0		AT1/0.1	point2point
	Bundle adjacency exp(vcd)					

show mpls forwarding-table

```

0(1) 1(1) 2(1) 3(1) 4(1) 5(1) 6(1) 7(1)
MAC/Encaps=12/16, MTU=4470, Tag Stack{19}
00010000AAAA030000008847 00013000
No output feature configured
19 17          20.0.0.0/8          0          AT1/0.1      point2point
Bundle adjacency exp(vcd)
0(1) 1(1) 2(1) 3(1) 4(1) 5(1) 6(1) 7(1)
MAC/Encaps=12/16, MTU=4470, Tag Stack{17}
00010000AAAA030000008847 00011000
No output feature configured
20 20          60.0.0.0/8          0          AT1/0.1      point2point
Bundle adjacency exp(vcd)
0(1) 1(1) 2(1) 3(1) 4(1) 5(1) 6(1) 7(1)
MAC/Encaps=12/16, MTU=4470, Tag Stack{20}
00010000AAAA030000008847 00014000
No output feature configured
21 Pop tag      60.0.0.0/24          0          AT1/0.1      point2point
Bundle adjacency exp(vcd)
0(1) 1(1) 2(1) 3(1) 4(1) 5(1) 6(1) 7(1)
MAC/Encaps=12/12, MTU=4474, Tag Stack{}
00010000AAAA030000008847
No output feature configured
22 Pop tag      1.0.0.4/32          0          Et2/3        40.0.0.4
MAC/Encaps=14/14, MTU=1504, Tag Stack{}
000427AD10430005DDFE043B8847
No output feature configured

```

Table 81 describes the significant fields shown in the displays.

Table 81 show mpls forwarding-table Field Descriptions

Field	Description
Local tag	Label assigned by this router.
Outgoing tag or VC	Label assigned by the next hop or virtual path identifier (VPI)/virtual channel identifier (VCI) used to get to next hop. The entries that you can specify in this column include the following: <ul style="list-style-type: none"> [T]—Means forwarding through an LSP tunnel. “Untagged”—Means that there is no label for the destination from the next hop or that label switching is not enabled on the outgoing interface. “Pop tag”—Means that the next hop advertised an implicit NULL label for the destination and that this router popped the top label. “Aggregate”—Means there are several prefixes for one local label. Used when IPv6 is configured on edge routers to transport IPv6 traffic over an IPv4 MPLS network.
Prefix or Tunnel Id	Address or tunnel to which packets with this label are going. <p>Note If IPv6 is configured on edge routers to transport IPv6 traffic over an IPv4 MPLS network, “IPv6” is displayed here.</p>
Bytes tag switched	Number of bytes switched with this incoming label.

Table 81 *show mpls forwarding-table Field Descriptions (continued)*

Field	Description
Outgoing interface	Interface through which packets with this label are sent.
Next Hop	IP address of the neighbor that assigned the outgoing label.
Bundle adjacency exp (vcd)	Bundle adjacency information. Includes the MPLS EXP value and the corresponding VCD.
MAC/Encaps	Length in bytes of the Layer 2 header and length in bytes of the packet encapsulation, including the Layer 2 header and label header.
MTU	Maximum transmission unit (MTU) of the labeled packet.
Tag Stack	All the outgoing labels. If the outgoing interface is transmission convergence (TC)-ATM, the VCD is also shown.
00010000AAAA030000008847 00013000	The actual encapsulation in hexadecimal form. A space is shown between Layer 2 and the label header.

show mpls interfaces

To display information about one or more or all interfaces that have been configured for label switching, use the **show mpls interfaces** command in privileged EXEC mode.

show mpls interfaces [*interface*] [**detail**]

Syntax Description

<i>interface</i>	(Optional) Defines the interface about which to display label switching information.
detail	(Optional) Displays detailed label switching information for the specified interface.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.1CT	This command was introduced.
12.0(10)ST	This command was modified to reflect Multiprotocol Label Switching (MPLS) Internet Engineering Task Force (IETF) command syntax and terminology.
12.1(3)T	This command was modified to reflect new MPLS IETF terminology and CLI command syntax.
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

This command shows MPLS information about the specified interface or about all the interfaces for which MPLS has been configured.

If no optional keyword or argument is specified in this command, summary information is displayed for each interface configured for label switching.

Examples

The following is sample output from the **show mpls interfaces** command:

```
Router# show mpls interfaces
```

```
Interface          IP          Tunnel  Operational
Ethernet1/1/1     Yes (tdp)  No      No
Ethernet1/1/2     Yes (tdp)  Yes     No
Ethernet1/1/3     Yes (tdp)  Yes     Yes
POS2/0/0          Yes (tdp)  No      No
ATM0/0.1          Yes (tdp)  No      No          (ATM labels)
ATM3/0.1          Yes (ldp)  No      Yes          (ATM labels)
ATM0/0.2          Yes (tdp)  No      Yes
```

**Note**

If an interface uses label-controlled ATM (LC-ATM) procedures, the associated line in the display is flagged with the notation “(ATM labels).”

Table 82 describes the significant fields shown in the display.

Table 82 *show mpls interfaces Field Descriptions*

Field	Description
Interface	Interface name.
IP	“Yes” if IP label switching (sometimes called hop-by-hop label switching) has been enabled on this interface.
Tunnel	“Yes” if label switched path (LSP) tunnel labeling has been enabled on this interface.
Operational	Operational state. “Yes” if packets are being labeled.

The following is sample output from the **show mpls interfaces** command when you specify the **detail** keyword:

```
Router# show mpls interfaces detail

Interface Ethernet1/1/1:
  IP labeling enabled (tdp)
  LSP Tunnel labeling not enabled
  MPLS operational
  MPLS turbo vector
  MTU = 1500
Interface POS2/0/0:
  IP labeling enabled (ldp)
  LSP Tunnel labeling not enabled
  MPLS not operational
  MPLS turbo vector
  MTU = 4470
Interface ATM3/0.1:
  IP labeling enabled (ldp)
  LSP Tunnel labeling not enabled
  MPLS operational
  MPLS turbo vector
  MTU = 4470
  ATM labels: Label VPI = 1
               Label VCI range = 33 - 65535
               Control VC = 0/32
```

Related Commands

Command	Description
mpls ip (global configuration)	Enables label switching of IPv4 packets on all interfaces.
mpls ip (interface configuration)	Enables label switching of IPv4 packets on the associated interface.
mpls label protocol (global configuration)	Specifies the label distribution protocol to be used on a given platform.
mpls label protocol (interface configuration)	Specifies the label distribution protocol to be used on a given interface.

Command	Description
mpls traffic-eng tunnels (global configuration)	Enables MPLS traffic engineering tunneling signaling on a device.
mpls traffic-eng tunnels (interface configuration)	Enables MPLS traffic engineering tunneling signaling on an interface.

show mpls ip binding

To display specified information about label bindings learned by the Label Distribution Protocol (LDP), use the **show mpls ip binding** command in privileged EXEC mode. To summarize information about label bindings learned by LDP, use the **show mpls ip binding summary** command in privileged EXEC mode.

```
show mpls ip binding [network {mask | length} [longer-prefixes]] [local-label {atm vpi vci |
label [- label]}] [remote-label {atm vpi vci | label [- label]}] [neighbor address] [local]
[interface interface] [generic | atm]
```

```
show mpls ip binding [summary]
```

Syntax Description	
<i>network</i>	(Optional) Defines the destination network number.
<i>mask</i>	(Optional) Defines the network mask, written as A.B.C.D.
<i>length</i>	(Optional) Defines the mask length (1 to 32 characters).
longer-prefixes	(Optional) Selects any prefix that matches the <i>mask</i> with a <i>length</i> from 1 to 32 characters.
local-label atm vpi vci	(Optional) Displays entry with locally assigned ATM label that matches the specified ATM label value.
local-label label - label	(Optional) Displays entries with locally assigned label(s) that match the specified label value(s). Use the <i>label - label</i> argument to indicate the label range.
remote-label atm vpi vci	(Optional) Displays entries with remotely assigned ATM label values learned from neighbor routers that match the specified ATM label value.
remote-label label - label	(Optional) Displays entries with remotely assigned label(s) learned from neighbor routers that match the specified label value(s). Use the <i>label - label</i> argument to indicate the label range.
neighbor address	(Optional) Displays label bindings assigned by the selected neighbor.
local	(Optional) Displays the local label bindings.
interface interface	(Optional) Displays label bindings associated with the specified interface (for label-controlled ATM (LC-ATM) only).
generic	(Optional) Displays only generic (non-LC-ATM) label bindings.
atm	(Optional) Displays only LC-ATM label bindings.
summary	(Optional) Displays summary information about label bindings learned by LDP.

Command Modes Privileged EXEC

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

The **show mpls ip binding** command displays label bindings learned by LDP or Tag Distribution Protocol (TDP).

A request can specify that the entire database be displayed, that a summary of entries from the database be displayed, or that the display be limited to a subset of entries. The subset can be limited according to any of the following:

- Prefix
- Input or output label values or ranges
- Neighbor advertising the label
- Interface for label bindings of interest (LC-ATM only)
- Generic (non-LC-ATM) label bindings
- LC-ATM label bindings

All label bindings are displayed when no arguments or keywords are specified.

Examples

The following is sample output from the **show mpls ip binding** command. The output shows all the label bindings in the database.

```
Router# show mpls ip binding

34.0.0.0/8
  in label:      20
  out label:     26          lsr: 155.0.0.55:0
  out vc label: 1/80        lsr: 203.0.7.7:2    ATM1/0.8
                    Active ingress 3 hops (vcd 49)

45.0.0.0/8
  in label:      25
  in vc label:   1/36        lsr: 203.0.7.7:2    ATM1/0.8
                    Active egress (vcd 55)
  out label:     imp-null    lsr: 155.0.0.55:0    inuse

66.66.0.66/32
  in label:      26
  in vc label:   1/39        lsr: 203.0.7.7:2    ATM1/0.8
                    Active egress (vcd 58)
  out label:     16          lsr: 155.0.0.55:0    inuse

133.0.0.33/32
  in label:      23
  out label:     22          lsr: 155.0.0.55:0
  out vc label: 1/83        lsr: 203.0.7.7:2    ATM1/0.8
                    Active ingress 3 hops (vcd 52)

144.0.0.44/32
  in label:      61
  out label:     27          lsr: 155.0.0.55:0    inuse

150.88.0.0/16
  in label:      28
  in vc label:   1/40        lsr: 203.0.7.7:2    ATM1/0.8
                    Active egress (vcd 59)
  out label:     imp-null    lsr: 155.0.0.55:0    inuse

166.47.0.0/16
  in label:      33
  in vc label:   1/46        lsr: 203.0.7.7:2    ATM1/0.8
                    Active egress (vcd 65)
  out label:     imp-null    lsr: 155.0.0.55:0    inuse
```

```

194.44.44.0/24
  in label:      24
  in vc label:  1/37      lsr: 203.0.7.7:2      ATM1/0.8
                Active   egress (vcd 56)
  out label:    imp-null  lsr: 155.0.0.55:0    inuse

```

In the following example, a request is made for the display of the label binding information for prefix 194.44.44.0/24:

```
Router# show mpls ip binding 194.44.44.0 24
```

```

194.44.44.0/24
  in label:      24
  in vc label:  1/37      lsr: 203.0.7.7:2      ATM1/0.8
                Active   egress (vcd 56)
  out label:    imp-null  lsr: 155.0.0.55:0    inuse

```

In the following example, the **local-label** keyword is used to request that label binding information be displayed for the prefix with local label 58:

```
Router# show mpls ip binding local-label 58
```

```

166.253.0.0/16
  in label:      58
  out label:    imp-null  lsr: 155.0.0.55:0    inuse

```

Table 83 describes the fields shown in the display.

Table 83 show mpls ip binding Field Descriptions

Field	Description
A.B.C.D/n	Destination prefix. Indicates that the following lines are for a particular destination (network/mask).
in label	Incoming label. This is the local label assigned by the label switch router (LSR) and advertised to other LSRs. The label value imp-null indicates the well-known Implicit NULL label.
out label	Outgoing label. This is a remote label learned from an LDP neighbor. The neighbor is identified by its LDP ID in the lsr field.
inuse	Indicates that the outgoing label is in use for Multiprotocol Label Switching (MPLS) forwarding; that is, it is installed in the MPLS forwarding table (LFIB).
in vc label	Incoming MPLS ATM label. This is the local virtual path identifier (VPI)/virtual channel identifier (VCI) assigned by the LSR as the incoming label for the destination and advertised to the upstream LSR(s).
out vc label	Outgoing MPLS ATM label. This is the VPI/VCI learned from the destination next hop as its label for the destination and advertised to this LSR.
ATM1/0.8	The ATM interface with which the MPLS ATM label is associated.

Table 83 show mpls ip binding Field Descriptions (continued)

Field	Description
Active	<p>The state of the label virtual circuit (LVC) associated with the destination prefix. Possible states include the following:</p> <ul style="list-style-type: none"> • Active. The label virtual circuit is established and operational. • Bindwait. Waiting for a response from the destination next hop. • Remote Resource Wait. Waiting for resources (VPI/VCI) to become available on the destination next hop. • Parent Wait. Transit LVC upstream side waiting for downstream side to become active. • AbortAckWait. Waiting for response to a Label Abort message sent to the destination next hop. • ReleaseWait. Waiting for response to a Label Withdraw message sent to an upstream neighbor.
vcd <i>n</i>	Virtual circuit descriptor number for the LVC.
ingress <i>n</i> hops	<p>Indicates whether the LSR is an ingress, transit, or egress node for the destination. Options include the following:</p> <ul style="list-style-type: none"> • Ingress <i>n</i> hops. The LSR is an ingress edge router for the MPLS ATM cloud for the destination. • Egress. The LSR is an egress edge router for the MPLS ATM cloud for the destination. • Transit. The LSR is a transit LSR within the MPLS ATM cloud for the destination.

In the following example, summary information about the label bindings learned by LDP is shown:

```
Router# show mpls ip binding summary
```

```
Total number of prefixes: 53
```

```
Generic label bindings
```

prefixes	assigned in labels	learned out labels
53	53	51

```
ATM label bindings summary
```

interface	total	active	local	remote	Bwait	Rwait	IFwait
ATM1/0.8	47	47	40	7	0	0	0

Table 84 describes the fields shown in the display.

Table 84 *show mpls ip binding summary Field Descriptions*

Field	Description
Total number of prefixes	Number of destinations for which the LSR has label bindings.
Generic label bindings prefixes	Indicates the start of summary information for “generic” label bindings. Generic labels are used for MPLS forwarding on all interface types except MPLS ATM interfaces.
assigned in labels	Number of destinations for which the LSR has a generic label binding.
learned out labels	Number of prefixes for which the LSR has assigned an incoming (local) label.
ATM label bindings summary	Number of prefixes for which the LSR has learned an outgoing (remote) label from an LDP neighbor.
interface	Indicates the start of summary information for MPLS ATM label bindings. An ATM label is a VPI/VCI.
total	Indicates a row in the ATM label bindings summary table. The summary information in the row is for ATM labels associated with this interface.
active	Total number of ATM labels associated with the interface.
local	Number of ATM labels (LVCs) in the Active (operational) state.
remote	Number of ATM labels assigned by this LSR for the interfaces. These are incoming labels.
Bwait	Number of ATM labels learned from the neighbor LSR for this interface. These are outgoing labels.
Rwait	Number of bindings (LVCs) waiting for a label assignment from the neighbor LSR for the interface.
IFwait	Number of bindings (LVCs) waiting for resources (VPI/VCI) to become available on the neighbor LSR for the interface.
	Number of bindings (LVCs) waiting for labels to be installed for switching use.

Related Commands

Command	Description
show mpls atm-ldp bindings	Displays specified entries from the ATM label binding database.
show mpls ldp bindings	Displays the contents of the LIB.

show mpls l2transport binding

To display VC label binding information, use the **show mpls l2transport binding** command in EXEC mode.

```
show mpls l2transport binding [vc-id | ip-address | local-label number | remote-label number]
```

Syntax Description		
<i>vc-id</i>	(Optional)	Displays VC label binding information for the specified VC.
<i>ip-address</i>	(Optional)	Displays VC label binding information for the specified VC destination.
local-label <i>number</i>	(Optional)	Displays VC label binding information for the specified local assigned label.
remote-label <i>number</i>	(Optional)	Displays VC label binding information for the specified remote assigned label.

Command Modes	
	EXEC

Command History	Release	Modification
	12.0(23)S	This command was introduced.
	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.
	12.0(27)S	This command was updated to display AToM Virtual Circuit Connection Verification (VCCV) information.
	12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE.
	12.2(30)S	This command was updated to display Connectivity Verification (CV) type capabilities.

Examples

The following example shows the VC label binding information for Cisco IOS Releases 12.0(27)S and 12.2(18)SXE and later:

```
Router# show mpls l2transport binding

Destination Address: 10.0.0.203, VC ID: 1
  Local Label: 16
    Cbit: 1, VC Type: Ethernet, GroupID: 0
    MTU: 1500, Interface Desc: n/a
    VCCV Capabilities: Type 1, Type 2
  Remote Label: 16
    Cbit: 1, VC Type: Ethernet, GroupID: 0
    MTU: 1500, Interface Desc: n/a
    VCCV Capabilities: Type 1, Type 2
```

The following examples shows the VC label binding information for Cisco IOS Release 12.2(30)S and later:

```
Router# show mpls l2transport binding

Destination Address: 5.5.5.51, VC ID: 108
  Local Label: 16
    Cbit: 1, VC Type: Ethernet, GroupID: 0
    MTU: 1500, Interface Desc: n/a
    VCCV: CC Type: CW [1], RA [2]
    CV Type: LSPV [2]
  Remote Label: 16
    Cbit: 1, VC Type: Ethernet, GroupID: 0
    MTU: 1500, Interface Desc: n/a
    VCCV: CC Type: RA [2]
    CV Type: LSPV [2]
```

The output of the command changed between Cisco IOS Releases. The following table maps the older output to the new output:

Output in Cisco IOS Releases 12.0(27)S and 12.2(18)SXE	Output In Cisco IOS Release 12.2(30)S
VCCV Capabilities	VCCV: CC Type
Type 1	CW [1]
Type 2	RA [2]

Table 85 describes the significant fields shown in the display.

Table 85 show mpls l2transport binding Field Descriptions

Field	Description
Destination Address	The IP address of the remote router's interface that is at the other end of the VC.
VC ID	The virtual circuit identifier assigned to one of the interfaces on the router.
Local Label	The VC label that a router signals to its peer router, which is used by the peer router during imposition.
Remote Label	The disposition VC label of the remote peer router.
Cbit	The control word bit. If it is set, the value is 1.
VC Type	The type of VC, such as Frame Relay, Ethernet, ATM, and so on.
Group ID	The group ID assigned to the local or remote VCs.
MTU	The maximum transmission unit assigned.
Interface Desc	Interface parameters, if applicable.

Table 85 show mpls l2transport binding Field Descriptions (continued)

Field	Description
VCCV Capabilities	<p>(Cisco IOS Releases 12.0(27)S and 12.2(18)SXE and later) AToM VCCV information. This field displays how an AToM VCCV packet is identified.</p> <ul style="list-style-type: none"> • Type 1—The Protocol ID field of in the AToM Control Word (CW) identified the AToM VCCV packet. • Type 2—An MPLS Router Alert (RA) Level above the VC label identified the AToM VCCV packet. Type 2 is used for VC types that do not support or do not interpret the AToM Control Word.
VCCV: CC Type	<p>(Cisco IOS Releases 12.2(30)S and later) The types of Control Channel (CC) processing that are supported. The number indicates the position of the bit that was set in the received octet. The following values can be displayed:</p> <ul style="list-style-type: none"> • CW [1]—Control Word • RA [2]—Router Alert • TTL [3]—Time to Live • Unkn [x]—Unknown
CV Type	<p>(Cisco IOS Releases 12.2(30)S and later) The type of Connectivity Verification (CV) packets that can be processed in the control channel of the MPLS pseudowire. The number indicates the position of the bit that was set in the received octet.</p> <ul style="list-style-type: none"> • ICMP [1]—Internet Control Management Protocol (ICMP) is used to verify connectivity. • LSPV [2]—LSP Ping is used to verify connectivity. • BFD [3]—Bidirectional Forwarding Detection is used to verify connectivity for more than one pseudowire. • Unkn [x]—A CV type was received that could not be interpreted.

Related Commands

Command	Description
show mpls l2transport hw-capability	Displays the transport types and their supported capabilities.

show mpls l2transport hw-capability

To display the transport types supported on an interface, use the **show mpls l2transport hw-capability** command in privileged EXEC mode.

show mpls l2transport hw-capability interface *type number*

Syntax Description

interface	Displays information for the specified interface.
<i>type number</i>	The type and number of the interface. For example, serial6/0.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0(23)S	This command was introduced.
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.
12.0(27)S	This command was updated to display AToM Virtual Circuit Connection Verification (VCCV) information.
12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE.
12.2(30)S	This command was updated to display VCCV type capabilities.

Usage Guidelines

This command can help you determine the interface to use for the various transport types. Use this command to check that core-facing and edge-facing interfaces can accommodate the different transport types.

Examples

The following is partial sample output from the **show mpls l2transport hw-capability** command for Cisco IOS Releases 12.0(23)S, 12.2(14)S, and 12.2(15)T and later. For more information on the fields, see [Table 86](#).

```
Router# show mpls l2transport hw-capability interface serial15/1

Interface Serial15/1

Transport type FR DLCI
  Core functionality:
    MPLS label disposition supported
    Control word processing supported
    Sequence number processing not supported
  Edge functionality:
    MPLS label imposition supported
    Control word processing supported
    Sequence number processing not supported
.
.
.
```

**Note**

These examples show only a portion of the output. The command displays the capabilities of every transport type.

The following is partial sample output from the **show mpls l2transport hw-capability** command for Cisco IOS Releases 12.0(27)S and 12.2(18)SXE and later. This output shows VCCV data under the Core Functionality section. Type 1 means that the AToM Control Word identified the AToM VCCV packet. For more information on the fields, see [Table 86](#).

```
Transport type FR DLCI
Core functionality:
  MPLS label disposition supported
  Control word processing supported
  Sequence number processing not supported
  VCCV CC Type 1 processing supported

Edge functionality:
  MPLS label imposition supported
  Control word processing supported
  Sequence number processing not supported
.
.
.
```

The following is partial sample output from the **show mpls l2transport hw-capability** command for Cisco IOS Releases 12.2(30)S and later. The VCCV output shows that AToM Control Word (CW) identified the AToM VCCV packet. For more information on the fields, see [Table 86](#).

```
Transport type FR DLCI
Core functionality:
  MPLS label disposition supported
  Control word processing supported
  Sequence number processing not supported
  VCCV CC Type CW [1] processing supported

Edge functionality:
  MPLS label imposition supported
  Control word processing supported
  Sequence number processing not supported
.
.
.
```

The output of the command changed between Cisco IOS Releases. The following table maps the older output to the new output:

Output in Cisco IOS Releases 12.0(27)S and 12.2(18)SXE and later	Output In Cisco IOS Release 12.2(30)S
VCCV CC processing supported	VCCV CC processing supported
Type 1	Type CW [1]

[Table 86](#) describes the significant fields shown in the display.

Table 86 *show mpls l2transport hw-capability Field Descriptions*

Field	Description
Transport type	Indicates the transport type.
Core functionality	Displays the functionalities that the core-facing interfaces support, such as label disposition, and control word and sequence number processing.
VCCV CC Type processing supported	<p>Displays whether the core-facing interfaces support Control Word processing, or Router Alert Processing.</p> <p>(Cisco IOS Releases 12.0(27)S and 12.2(18)SXE and later)</p> <ul style="list-style-type: none"> Type 1—The Protocol ID field of in the AToM Control Word (CW) identified the AToM VCCV packet. <p>(Cisco IOS Releases 12.2(30)S and later)</p> <ul style="list-style-type: none"> CW [1]—Control Word Unkn [x]—Unknown. The number indicates the position of the bit that was set in the received octet.
Edge functionality	Displays the functionalities that the edge-facing interfaces support, such as label disposition, and control word and sequence number processing.

show mpls l2transport summary

To display summary information about virtual circuits (VCs) that have been enabled to route Any Transport over MPLS (AToM) Layer 2 packets on a router, use the **show mpls l2transport summary** command in privileged EXEC mode.

show mpls l2transport summary

Syntax Description This command has no arguments or keywords.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.0(23)S	This command was introduced.
	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.

Examples The following sample output shows summary information about the VCs that have been enabled to transport Layer 2 packets:

```
Router# show mpls l2transport summary

Destination address: 172.16.24.12 Total number of VCs: 60
0 unknown, 58 up, 0 down, 2 admin down
5 active vc on MPLS interface PO4/0
```

[Table 87](#) describes the fields shown in the display.

Table 87 *show mpls l2transport summary Field Descriptions*

Field	Description
Destination address	The IP address of the remote router to which the VC has been established.
Total number of VCs	The number of VCs that have been established.
unknown	The number of VCs that are in an unknown state.
up	The number of VCs that are operational.
down	The number of VCs that are not operational.
admin down	The number of VCs that have been disabled.

Related Commands	Command	Description
	show mpls l2transport vc	Displays information about AToM VCs that have been enabled to route Layer 2 packets on a router.

show mpls l2transport vc

To display information about Any Transport over MPLS (AToM) virtual circuits (VCs) that have been enabled to route Layer 2 packets on a router, use the **show mpls l2transport vc** command in privileged EXEC mode.

```
show mpls l2transport vc [vcid vc-id] | [vc-id-min vc-id-max] [interface name [local-circuit-id]]
[destination ip-address | name] [detail]
```

Syntax Description	
vcid	(Optional) The VC ID assigned to the router.
<i>vc-id</i>	(Optional) The VC ID.
<i>vc-id-min</i> and <i>vc-id-max</i>	(Optional) The VCs that are assigned the range of VC IDs that you specify. The range is from 1 to 4,294,967,295. (This argument is primarily for legacy implementations.)
interface	(Optional) The interface or subinterface of the router that has been enabled to transport Layer 2 packets. This keyword lets you display information about the VCs that have been assigned VC IDs on that interface or subinterface.
<i>name</i>	(Optional) The name of the interface or subinterface.
<i>local-circuit-id</i>	(Optional) The number assigned to the local circuit. This argument value applies only to the following transport types: <ul style="list-style-type: none"> For Frame Relay, enter the Data Link Connection Identifier (DLCI) of the permanent virtual circuit (PVC). For ATM adaptation layer 5 (AAL5) and Cell Relay, enter the virtual path identifier (VPI)/virtual channel identifier (VCI) of the PVC. For Ethernet virtual LANs (VLANs), enter the VLAN number.
destination	(Optional) Information about the VCs that have been assigned VC IDs for the remote router you specify.
<i>ip-address</i>	(Optional) The IP address of the remote router.
<i>name</i>	(Optional) The name assigned to the remote router.
detail	(Optional) Detailed information about the VCs that have been assigned VC IDs.

Command Modes Privileged EXEC

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 updated to include the interface and destination keywords.
	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

If you do not specify any keywords or arguments, the command displays a summary of all the VCs.

Examples

The output of the commands varies, depending on the type of Layer 2 packets being transported over the AToM VCs.

The following sample output shows information about the interfaces and VCs that have been configured to transport various Layer 2 packets on the router:

```
Router# show mpls l2transport vc
```

Local intf	Local circuit	Dest address	VC ID	Status
Se5/0	FR DLCI 55	13.0.0.1	55	UP
AT4/0	ATM AAL5 0/100	13.0.0.1	100	UP
AT4/0	ATM AAL5 0/200	13.0.0.1	200	UP
AT4/0.300	ATM AAL5 0/300	13.0.0.1	300	UP

Table 88 describes the fields shown in the display.

Table 88 show mpls l2transport vc Field Descriptions

Field	Description
Local intf	The interface on the local router that has been enabled to transport Layer 2 packets.
Local circuit	The type and number (if applicable) of the local circuit. The output shown in this column varies, according to transport type: <ul style="list-style-type: none"> For Frame Relay, the output shows the DLCI of the PVC. For ATM cell relay and AAL5, the output shows the VPI/VCI of the PVC. For Ethernet VLANs, the output shows the VLAN number. For Point-to-Point Protocol (PPP) and High-Level Data Link Control (HDLC), the output shows the interface number.
Dest address	The IP address of the remote router's interface that is the other end of the VC.
VC ID	The virtual circuit identifier assigned to one of the interfaces on the router.
Status	The status of the VC. The status can be one of the following: <p>UP—The VC is in a state where it can carry traffic between the two VC endpoints. A VC is up when both imposition and disposition interfaces are programmed.</p> <ul style="list-style-type: none"> The disposition interfaces is programmed if the VC has been configured and the client interface is up. The imposition interface is programmed if the disposition interface is programmed and you have a remote VC label and an IGP label. The IGP label can be implicit null in a back-to-back configuration. (An IGP label means there is an LSP to the peer.) <p>DOWN—The VC is not ready to carry traffic between the two VC endpoints. Use the detail keyword to determine the reason that the VC is down.</p> <p>ADMIN DOWN—The VC has been disabled by a user.</p>

The following sample output shows information about VCs that have been configured to transport Layer 2 packets:

```
Router# show mpls l2transport vc detail

Local interface: AT4/0 up, line protocol up, ATM AAL5 0/200 up
Destination address: 13.13.13.13, VC ID: 100, VC status: up
  Tunnel label: imp-null, next hop point2point
  Output interface: PO0/1/0, imposed label stack {16}
  Create time: 00:16:44, last status change time: 00:15:45
  Signaling protocol: LDP, peer 13.13.13.13:0 up
  MPLS VC labels: local 16, remote 16
  Group ID: local 12, remote 1
  MTU: local 1500, remote 1500
  Remote interface description:
  Sequencing: receive disabled, send disabled
  VC statistics:
    packet totals: receive 56, send 55
    byte totals:  receive 10181, send 10569
    packet drops:  receive 0, send 0
```

Table 89 describes the significant fields displayed in the display.

Table 89 *show mpls l2transport vc detail Field Descriptions*

Field	Description
Local interface	The interface on the local router that has been enabled to transmit and receive Layer 2 packets. The interface varies, depending on the transport type. The output also shows the status of the interface.
line protocol	The status of the line protocol on the edge-facing interface.
ATM AAL5 0/200	The type, number (if applicable), and status of the local circuit. The output varies, depending on the transport type: <ul style="list-style-type: none"> For Frame Relay, the output shows the DCLI of the PVC. For ATM cell relay and AAL5, the output shows the VPI/VCI of the PVC. For Ethernet VLANs, the output shows the VLAN number.
Destination address	The IP address of the remote router specified for this VC. You specify the destination IP address as part of the mpls l2transport route command.
VC ID	The virtual circuit identifier assigned to the interface on the router.

Table 89 *show mpls l2transport vc detail Field Descriptions (continued)*

Field	Description
VC status	<p>The status of the VC. The status can be one of the following:</p> <p>UP—The VC is in a state where it can carry traffic between the two VC endpoints. A VC is up when both imposition and disposition interfaces are programmed.</p> <ul style="list-style-type: none"> • The disposition interface is programmed if the VC has been configured and the client interface is up. • The imposition interface is programmed if the disposition interface is programmed and a remote VC label and an Interior Gateway Protocol (IGP) label exist. The IGP label can be an implicit null in a back-to-back configuration. (An IGP label means there is a label switched path [LSP] to the peer.) <p>DOWN—The VC is not ready to carry traffic between the two VC endpoints.</p> <p>ADMIN DOWN—The VC has been disabled by a user.</p>
Tunnel label	<p>An IGP label used to route the packet over the MPLS backbone to the destination router with the egress interface. The first part of the output displays the type of label. The second part of output displays the route information.</p> <p>The tunnel label information can display any of the following states:</p> <p>imp-null: The provider core (P) router is absent and the tunnel label will not be used. Alternatively, imp-null can signify traffic engineering tunnels between the PE routers.</p> <p>unassigned: The label has not been assigned.</p> <p>no route: The label is not in the routing table.</p> <p>no adjacency: The adjacency for the next hop is missing.</p> <p>not ready, no route: An IP route for the peer does not exist in the routing table.</p> <p>not ready, not a host table: The route in the routing table for the remote peer router is not a host route.</p> <p>not ready, CEF disabled: CEF is disabled.</p> <p>not ready, LFIB disabled: The MPLS switching subsystem is disabled.</p> <p>not ready, LFIB entry present: The tunnel label exists in the LFIB, but the VC is down.</p>
Output interface	The interface on the remote router that has been enabled to transmit and receive Layer 2 packets.
imposed label stack	Summary of the MPLS label stack used to direct the VC to the PE router.
Create time	The time when the VC was provisioned.
last status change time	The last time the VC state changed.
Signaling protocol	The type of protocol used to send the MPLS labels. The output also shows the status of the peer router.

Table 89 *show mpls l2transport vc detail Field Descriptions (continued)*

Field	Description
MPLS VC labels	The local VC label is a disposition label, which determines the egress interface of an arriving packet from the MPLS backbone. The remote VC label is a disposition VC label of the remote peer router.
Group ID	The local group ID is used to group VCs locally. The remote group ID is used by the peer to group several VCs.
MTU	The maximum transmission unit specified for the local and remote interfaces.
Remote interface description	The interface on the remote router that has been enabled to transmit and receive Layer 2 packets.
Sequencing	Indicates whether sequencing of out-of-order packets is enabled or disabled.
packet totals	The number of packets sent and received. Received packets are those AToM packets received from the MPLS core. Sent packets are those AToM packets sent to the MPLS core. This number does not include dropped packets.
byte totals	The number of packets sent and received from the core-facing interface, including the payload, VC label, and AToM control word (if present).
packet drops	The number of packets that were dropped as they were sent or received from the core-facing interface.

Related Commands

Command	Description
show mpls l2transport summary	Displays summary information about VCs that have been enabled to route AToM Layer 2 packets on a router.

show mpls label range

To display the range of local labels available for use on packet interfaces, use the **show mpls label range** command in privileged EXEC mode.

show mpls label range

Syntax Description This command has no optional keywords or arguments

Command Modes Privileged EXEC

Command History	Release	Modification
	12.0(9)ST	This command was introduced.

Usage Guidelines You can use the **mpls label range** command to configure a range for local labels that is different from the default range. If the newly configured range does not overlap the current range, then the new range will not take effect until the router is reloaded. In this situation, the **show mpls label range** command displays both the label range currently in use and the label range that will be in use following the next router reload.

Examples In the following example, the use of the **show mpls label range** command is shown before and after the **mpls label range** command is used to configure a label range that does not overlap the starting label range.

```
Router# show mpls label range

Downstream label pool: Min/Max label: 16/100000

Router# configure terminal

Router(config)# mpls label range 200 120000
% Label range changes will take effect at the next reload.
Router(config)# exit

Router# show mpls label range

Downstream label pool: Min/Max label: 16/100000
 [Configured range for next reload: Min/Max label: 200/120000]
```

Related Commands	Command	Description
	mpls label range	Configures a range of values for use as local labels.

show mpls ldp backoff

To display information about the configured session setup backoff parameters and any potential Label Distribution Protocol (LDP) peers with which session setup attempts are being throttled, use the **show mpls ldp backoff** command in privileged EXEC mode.

show mpls ldp backoff

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

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.

Examples

The following is sample output from the **show mpls ldp backoff** command:

```
Router# show mpls ldp backoff

LDP initial/maximum backoff: 30/240 sec
Backoff table: 2 entries
LDP Id           Backoff(sec)    Waiting(sec)
144.0.0.44:0     60              30
155.0.0.55:0     120             90
```

[Table 90](#) describes the fields shown in the display.

Table 90 show mpls ldp backoff Field Descriptions

Field	Description
LDP initial/maximum backoff	Indicates the configured backoff parameters in seconds.
Backoff table	Contains a list of discovered LDP neighbors for which session setup is being delayed because of previous failures to establish a session due to incompatible configuration. The backoff table incorporates the following information: <ul style="list-style-type: none"> LDP Id—Identifies the LDP neighbors. Backoff (sec)—Shows the amount of time that session setup is being delayed. Waiting (sec)—Shows the approximate amount of time that session setup has been delayed.

■ show mpls ldp backoff

Related Commands	Command	Description
	mpls ldp backoff	Configures session setup delay parameters for the LDP backoff mechanism.

show mpls ldp bindings

To display the contents of the label information base (LIB), use the **show mpls ldp bindings** command in privileged EXEC mode.

```
show mpls ldp bindings [network {mask | length} [longer-prefixes]]
[local-label label [- label]] [remote-label label [- label] [neighbor address] [local]
```

Syntax Description	
<i>network</i>	(Optional) Defines the destination network number.
<i>mask</i>	(Optional) Specifies the network mask, written as A.B.C.D.
<i>length</i>	(Optional) Specifies the mask length (1 to 32 characters).
longer-prefixes	(Optional) Selects any prefix that matches <i>mask</i> with a <i>length</i> from 1 to 32 characters.
local-label <i>label - label</i>	(Optional) Display entries matching local label values. Use the <i>label - label</i> argument to indicate the label range.
remote-label <i>label - label</i>	(Optional) Displays entries matching the label values assigned by a neighbor router. Use the <i>label - label</i> argument to indicate the label range.
neighbor <i>address</i>	(Optional) Displays the label bindings assigned by the selected neighbor.
local	(Optional) Displays the local label bindings.

Command Modes Privileged EXEC

Command History	Release	Modification
	11.1CT	This command was introduced.
	12.0(10)ST	This command was modified to reflect Multiprotocol Label Switching (MPLS) Internet Engineering Task Force (IETF) command syntax and terminology.
	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 The **show mpls ldp bindings** command displays label bindings learned by Label Distribution Protocol (LDP) or Tag Distribution Protocol (TDP).

A request can specify that the entire database be displayed, or that the display be limited to a subset of entries according to the following:

- Prefix
- Input or output label values or ranges
- Neighbor advertising the label

If no optional keyword or argument is supplied, the command displays the entire LIB.

**Note**

The **show mpls ip binding** command includes the output generated by the **show mpls ldp bindings** command, as well as information about label bindings for LC-ATM interfaces.

Examples

The following is sample output from the **show mpls ldp bindings** command. This form of the command causes the contents of the entire forwarding information base (FIB) to be displayed.

```
Router# show mpls ldp bindings
34.0.0.0/8, rev 9
  local binding:  label: imp-null
  remote binding: lsr: 155.0.0.55:0, label: 17
  remote binding: lsr: 66.66.0.66:0, label: 18
  remote binding: lsr: 144.0.0.44:0, label: imp-null
45.0.0.0/8, rev 17
  local binding:  label: 19
  remote binding: lsr: 155.0.0.55:0, label: imp-null
  remote binding: lsr: 66.66.0.66:0, label: 16
  remote binding: lsr: 144.0.0.44:0, label: imp-null
66.66.0.66/32, rev 19
  local binding:  label: 20
  remote binding: lsr: 155.0.0.55:0, label: 19
  remote binding: lsr: 66.66.0.66:0, label: imp-null
  remote binding: lsr: 144.0.0.44:0, label: 18
103.0.0.0/8, rev 11
  local binding:  label: imp-null
130.77.0.0/16, rev 23
  local binding:  label: 22
  remote binding: lsr: 155.0.0.55:0, label: 22
  remote binding: lsr: 144.0.0.44:0, label: 21
  remote binding: lsr: 66.66.0.66:0, label: 20
140.66.0.0/16, rev 96
  remote binding: lsr: 66.66.0.66:0, label: imp-null
155.0.0.55/32, rev 29
  local binding:  label: 25
  remote binding: lsr: 155.0.0.55:0, label: imp-null
  remote binding: lsr: 144.0.0.44:0, label: 24
  remote binding: lsr: 66.66.0.66:0, label: 24
166.45.0.0/16, rev 33
  local binding:  label: 27
  remote binding: lsr: 155.0.0.55:0, label: imp-null
  remote binding: lsr: 66.66.0.66:0, label: 26
  remote binding: lsr: 144.0.0.44:0, label: 26
166.46.0.0/16, rev 35
  local binding:  label: 28
  remote binding: lsr: 155.0.0.55:0, label: imp-null
  remote binding: lsr: 66.66.0.66:0, label: 27
  remote binding: lsr: 144.0.0.44:0, label: 27
.
.
.
```

The following is sample output from the **show mpls ldp bindings** *network length longer-prefixes neighbor address* variant of the command; it displays labels learned from label switch router (LSR) 144.0.0.44 for network 166.0.0.0 and any of its subnets. The use of the **neighbor** keyword suppresses the output of local labels and labels learned from other neighbors.

```
Router# show mpls ldp bindings 166.0.0.0 8 longer-prefixes neighbor 144.0.0.44

166.44.0.0/16, rev 31
    remote binding: lsr: 144.0.0.44:0, label: 25
166.45.0.0/16, rev 33
    remote binding: lsr: 144.0.0.44:0, label: 26
166.245.0.0/16, rev 71
    remote binding: lsr: 144.0.0.44:0, label: 45
166.246.0.0/16, rev 73
    remote binding: lsr: 144.0.0.44:0, label: 46
.
.
.
```

Table 91 describes the fields shown in the display.

Table 91 *show mpls ldp bindings Field Descriptions*

Field	Description
A.B.C.D/n	IP prefix and mask for a particular destination (network/mask).
rev	Revision number (rev) that is used internally to manage label distribution for this destination.
remote binding	List of outgoing labels for this destination learned from other LSRs. Each item in this list identifies the LSR from which the outgoing label was learned and the label itself. The LSR is identified by its LDP identifier.

Related Commands

Command	Description
show mpls ldp neighbor	Displays the status of LDP sessions.

show mpls ldp discovery

To display the status of the Label Distribution Protocol (LDP) discovery process, use the **show mpls ldp discovery** command in privileged EXEC mode.

show mpls ldp discovery

Syntax Description This command has no arguments or keywords.

Command Modes Privileged EXEC

Command History	Release	Modification
	11.1CT	This command was introduced.
	12.0(10)ST	This command was modified to reflect Multiprotocol Label Switching (MPLS) Internet Engineering Task Force (IETF) command syntax and terminology.
	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 This command displays neighbor discovery information for LDP or Tag Distribution Protocol (TDP). This command generates a list of interfaces over which the LDP discovery process is running.

Examples The following is sample output from the **show mpls ldp discovery** command:

```
Router# show mpls ldp discovery

Local LDP Identifier:
 8.1.1.1:0
Discovery Sources:
  Interfaces:
   Ethernet1/1/3 (ldp): xmit/recv
     LDP Id: 177.73.0.77:0
     LDP Id: 144.0.0.44:0
     LDP Id: 155.0.0.55:0
   ATM3/0.1 (ldp): xmit/recv
     LDP Id: 203.0.7.7:2
   ATM0/0.2 (tdp): xmit/recv
     TDP Id: 119.1.0.1:1
Targeted Hellos:
 8.1.1.1 -> 133.0.0.33 (ldp): active, xmit/recv
     LDP Id: 133.0.0.33:0
 8.1.1.1 -> 168.7.0.16 (tdp): passive, xmit/recv
     TDP Id: 133.0.0.33:0
```

Table 92 describes the fields shown in the display.

Table 92 *show mpls ldp discovery Field Descriptions*

Field	Description
Local LDP Identifier	<p>The LDP identifier for the local router. An LDP identifier is a 6-byte construct displayed in the form “IP address:number.”</p> <p>By convention, the first four bytes of the LDP identifier constitute the router ID; integers, starting with 0, constitute the final two bytes of the IP address:number construct.</p>
Interfaces	<p>Lists the interfaces that are engaging in LDP discovery activity, described below:</p> <ul style="list-style-type: none"> • The <code>xmit</code> field—Indicates that the interface is transmitting LDP discovery Hello packets. • The <code>recv</code> field—Indicates that the interface is receiving LDP discovery Hello packets. • The <code>(ldp)</code> or <code>(tdp)</code> field—Indicates the label distribution protocol configured for the interface. <p>The LDP (or TDP) identifiers indicate the LDP (or TDP) neighbors discovered on the interface.</p>
Targeted Hellos	<p>Lists the platforms to which targeted Hello messages are being sent, as described below:</p> <ul style="list-style-type: none"> • The <code>xmit</code>, <code>recv</code>, <code>(ldp)</code>, and <code>(tdp)</code> fields are as described above for the Interfaces field. • The <code>active</code> field indicates that this LSR has initiated targeted Hello messages. • The <code>passive</code> field indicates that the neighbor LSR has initiated targeted Hello messages and that this LSR is configured to respond to the targeted Hello messages from the neighbor. <p>Note The entry for a given target platform may indicate both active and passive.</p>

Related Commands

Command	Description
mpls label protocol (global configuration)	Specifies the label distribution protocol (LDP or TDP) to be used on a platform.
mpls label protocol (interface configuration)	Specifies the label distribution protocol (LDP or TDP) to be used on a given interface.
show mpls ldp neighbor	Displays the status of LDP sessions.
show mpls interfaces	Displays information about one or more interfaces that have been configured for label switching.

show mpls ldp neighbor

To display the status of Label Distribution Protocol (LDP) sessions, use the **show mpls ldp neighbor** command in privileged EXEC mode.

show mpls ldp neighbor [*address* | *interface*] [**detail**]

Syntax Description		
	<i>address</i>	(Optional) Identifies the neighbor with this IP address.
	<i>interface</i>	(Optional) Defines the LDP neighbors accessible over this interface.
	detail	(Optional) Displays information in long form.

Command Modes Privileged EXEC

Command History	Release	Modification
	11.1CT	This command was introduced.
	12.0(10)ST	This command was modified to reflect Multiprotocol Label Switching (MPLS) Internet Engineering Task Force (IETF) command syntax and terminology.
	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 The **show mpls ldp neighbor** command can provide information about all LDP neighbors, or the information can be limited to the following:

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

This command displays information about all LDP neighbors if no optional keywords or arguments are specified.



Note

This command displays information about LDP and Tag Distribution Protocol (TDP) neighbor sessions.

Examples

The following is sample output from the **show mpls ldp neighbor** command:

```
Router# show mpls ldp neighbor

Peer LDP Ident: 203.0.7.7:2; Local LDP Ident 8.1.1.1:1
  TCP connection: 203.0.7.7.11032 - 8.1.1.1.646
  State: Oper; Msgs sent/rcvd: 5855/6371; Downstream on demand
  Up time: 13:15:09
  LDP discovery sources:
    ATM3/0.1
Peer LDP Ident: 7.1.1.1:0; Local LDP Ident 8.1.1.1:0
  TCP connection: 7.1.1.1.646 - 8.1.1.1.11006
  State: Oper; Msgs sent/rcvd: 4/411; Downstream
```

```

Up time: 00:00:52
LDP discovery sources:
  Ethernet1/0/0
Addresses bound to peer LDP Ident:
  2.0.0.29      7.1.1.1      59.0.0.199   212.10.1.1
  10.205.0.9

```

Table 93 describes the fields shown in the display.

Table 93 *show mpls ldp neighbor Field Descriptions*

Field	Description
Peer LDP Ident	LDP identifier of the neighbor (peer) for this session.
Local LDP Ident	LDP identifier for the local label switch router (LSR) for this session.
TCP connection	TCP connection used to support the LDP session, shown in the following format: <ul style="list-style-type: none"> peer IP address.peer port local IP address.local port
State	State of the LDP session. Generally this is Oper (operational), but transient is another possible state.
Msgs sent/rcvd	Number of LDP messages sent to and received from the session peer. The count includes the transmission and receipt of periodic keepalive messages, which are required for maintenance of the LDP session.
Downstream on demand	Indicates that the Downstream on Demand (DoD) method of label distribution is being used for this LDP session. When the DoD method is used, an LSR advertises its locally assigned (incoming) labels to its LDP peer only when the peer requests them.
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 (subject to any configured access list restrictions).
Up time	Length of time the LDP session has existed.
LDP discovery sources	Source(s) of LDP discovery activity that led to the establishment of this LDP session.
Addresses bound to peer LDP Ident	Known interface addresses of the LDP session peer. These are addresses that might 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 mpls ldp discovery	Displays the status of the LDP discovery process.

show mpls ldp parameters

To display current Label Distribution Protocol (LDP) parameters, use the **show mpls ldp parameters** command in privileged EXEC mode.

show mpls ldp parameters

Syntax Description This command has no arguments or keywords.

Command Modes Privileged EXEC

Command History	Release	Modification
	11.1CT	This command was introduced.
	12.0(10)ST	This command was modified to reflect Multiprotocol Label Switching (MPLS) Internet Engineering Task Force (IETF) command syntax and terminology.
	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.

Examples The following is sample output from the **show mpls ldp parameters** command:

```
Router# show mpls ldp parameters

Protocol version: 1
Downstream label pool: min label 16; max label 100000
Session hold time: 180 sec; keep alive interval: 60 sec
Discovery hello: holdtime: 15 sec; interval: 5 sec
Discovery targeted hello: holdtime: 180 sec; interval: 5 sec
LDP for targeted sessions; peer acl: 1
LDP initial/maximum backoff: 30/240 sec
Router#
```

[Table 94](#) describes the fields shown in the display.

Table 94 show mpls ldp parameters Field Descriptions

Field	Description
Protocol version	Indicates the version of LDP running on the platform.
Downstream label pool	Describes the range of labels available for the platform to assign for label switching purposes. The available labels range 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 that an LDP session is to be maintained with an LDP peer without receiving LDP traffic or an LDP keepalive message from the peer.

Table 94 *show mpls ldp parameters Field Descriptions (continued)*

Field	Description
keep alive interval	Indicates the interval of time between consecutive transmissions of LDP keepalive messages to an LDP peer.
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 the transmission of consecutive LDP Hello messages to neighbors (interval).
Discovery targeted hello	Indicates the amount of time to remember that a neighbor platform wants an LDP session when: <ol style="list-style-type: none"> 1. The neighbor platform is not directly connected to the router. 2. The neighbor platform has not sent an LDP Hello message. This intervening interval is known as hold time. Also indicates the time interval between the transmission of consecutive Hello messages to a neighbor not directly connected to the router.
LDP for targeted sessions	Reports the parameters that have been set by the mpls ldp neighbor targeted command.
LDP initial/maximum backoff	Reports the parameters that have been set by the mpls ldp backoff command.

Related Commands

Command	Description
mpls ldp backoff	Configures parameters for the LDP backoff mechanism.
mpls ldp neighbor targeted	Configure the use of LDP for targeted sessions.

show mpls prefix-map

To show the prefix map used to assign a quality of service (QoS) map to network prefixes that match a standard IP access list, use the **show mpls prefix-map** command in privileged EXEC mode.

```
show mpls prefix-map [prefix-map]
```

Syntax Description	<i>prefix-map</i>	(Optional) Number specifying the prefix map to be displayed.
---------------------------	-------------------	--

Command Modes	Privileged EXEC
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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	Not entering a specific <i>prefix-map</i> argument number causes all prefix maps to be displayed.
-------------------------	---

Examples	The following is sample output from the show mpls prefix-map command:
-----------------	--

```
Router# show mpls prefix-map 2
prefix-map 2 access-list 2 cos-map 2
```

[Table 95](#) describes the fields shown in the display.

Table 95 *show mpls prefix-map* Field Descriptions

Field	Description
prefix-map	Unique number of a prefix map.
access-list	Unique number of an access list.
cos-map	Unique number of a QoS map.

Related Commands	Command	Description
	mpls prefix-map	Configures a router to use a specified QoS map when a label destination prefix matches the specified access-list.

show mpls traffic-eng autoroute

To display tunnels announced to the Interior Gateway Protocol (IGP), including interface, destination, and bandwidth, use the **show mpls traffic-eng autoroute** command in user EXEC or privileged EXEC mode.

show mpls traffic-eng autoroute

Defaults

No default behavior or values.

Command Modes

User EXEC
Privileged EXEC

Command History

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

Usage Guidelines

The enhanced shortest path first (SPF) calculation of the IGP has been modified so that it uses traffic engineering tunnels. This command shows which tunnels IGP is currently using in its enhanced SPF calculation (that is, which tunnels are up and have autoroute configured).

Examples

The following is sample output from the **show mpls traffic-eng autoroute** command.

Note that the tunnels are organized by destination. All tunnels to a destination carry a share of the traffic tunneled to that destination.

```
Router# show mpls traffic-eng autoroute

MPLS TE autorouting enabled
  destination 0002.0002.0002.00 has 2 tunnels
    Tunnel1021 (traffic share 10000, nexthop 2.2.2.2, absolute metric 11)
    Tunnel1022 (traffic share 3333, nexthop 2.2.2.2, relative metric -3)
  destination 0003.0003.0003.00 has 2 tunnels
    Tunnel1032 (traffic share 10000, nexthop 3.3.3.3)
    Tunnel1031 (traffic share 10000, nexthop 3.3.3.3, relative metric -1)
```

[Table 96](#) describes the significant fields shown in the display.

Table 96 show mpls traffic-eng autoroute Field Descriptions

Field	Description
MPLS TE autorouting enabled	IGP automatically routes traffic into tunnels.
destination	MPLS traffic engineering tailend router system ID.

Table 96 *show mpls traffic-eng autoroute Field Descriptions (continued)*

Field	Description
traffic share	A factor based on bandwidth, indicating how much traffic this tunnel should carry, relative to other tunnels, to the same destination. If two tunnels go to a single destination, one with a traffic share of 200 and the other with a traffic share of 100, the first tunnel carries two-thirds of the traffic.
nexthop	MPLS traffic engineering tailend IP address of the tunnel.
absolute metric	MPLS traffic engineering metric with mode absolute of the tunnel.
relative metric	MPLS traffic engineering metric with mode relative of the tunnel.

Related Commands

Command	Description
show isis mpls traffic-eng tunnel	Displays information about tunnels considered in the IS-IS next hop calculation.
tunnel mpls traffic-eng autoroute announce	Causes the IGP to use the tunnel (if it is up) in its enhanced SPF calculation.
tunnel mpls traffic-eng autoroute metric	Specifies the MPLS traffic engineering tunnel metric that the IGP enhanced SPF calculation will use.

show mpls traffic-eng link-management admission-control

To show which tunnels were admitted locally and their parameters (such as, priority, bandwidth, incoming and outgoing interface, and state), use the **show mpls traffic-eng link-management admission-control** command in user EXEC or privileged EXEC mode.

show mpls traffic-eng link-management admission-control [*interface-name*]

Syntax Description	<i>interface-name</i>	(Optional) Displays only tunnels that were admitted on the specified interface.
---------------------------	-----------------------	---

Command Modes	User EXEC Privileged EXEC
----------------------	------------------------------

Command History	Release	Modification
	12.0(5)S	This command was introduced.
	12.1(3)T	The command output changed. The BW field now shows bandwidth in kBps, and it is followed by the status (reserved or held) of the bandwidth.

Examples The following is sample output from the **show mpls traffic-eng link-management admission-control** command:

```
Router2# show mpls traffic-eng link-management admission-control

System Information::
  Tunnels Count:      4
  Tunnels Selected:   4
TUNNEL ID            UP IF      DOWN IF    PRIORITY STATE          BW (kbps)
10.106.0.6 1000_1  AT1/0.2   -          0/0           Resv Admitted  0
10.106.0.6 2000_1  Et4/0/1   -          1/1           Resv Admitted  0
10.106.0.6 1_2     Et4/0/1   Et4/0/2   1/1           Resv Admitted  3000          R
10.106.0.6 2_2     AT1/0.2   AT0/0.2   1/1           Resv Admitted  3000          R
```

[Table 97](#) describes the significant fields shown in the display.

Table 97 *show mpls traffic-eng link-management admission-control* Field Descriptions

Field	Description
Tunnels Count	Total number of tunnels admitted.
Tunnels Selected	Number of tunnels to be displayed.
TUNNEL ID	Tunnel identification.
UP IF	Upstream interface that the tunnel used.
DOWN IF	Downstream interface that the tunnel used.
PRIORITY	Setup priority of the tunnel followed by the hold priority.

Table 97 *show mpls traffic-eng link-management admission-control Field Descriptions (continued)*

Field	Description
STATE	Admission status of the tunnel.
BW (kbps)	Bandwidth of the tunnel (in kBps). If an “R” follows the bandwidth number, the bandwidth is reserved. If an “H” follows the bandwidth number, the bandwidth is temporarily being held for a path message.

Related Commands

Command	Description
show mpls traffic-eng link-management advertisements	Displays local link information that MPLS traffic engineering link management is currently flooding into the global traffic engineering topology.
show mpls traffic-eng link-management bandwidth-allocation	Displays current local link information.
show mpls traffic-eng link-management igp-neighbors	Displays IGP neighbors.
show mpls traffic-eng link-management interfaces	Displays per-interface resource and configuration information.
show mpls traffic-eng link-management summary	Displays a summary of link management information.

show mpls traffic-eng link-management advertisements

To show local link information that MPLS traffic engineering link management is currently flooding into the global traffic engineering topology, use the **show mpls traffic-eng link-management advertisements** command in user EXEC or privileged EXEC mode.

show mpls traffic-eng link-management advertisements

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.0(5)S	This command was introduced.
12.1(3)T	The command output was modified.

Examples

The following is sample output from the **show mpls traffic-eng link-management advertisements** command:

```
Router1# show mpls traffic-eng link-management advertisements
```

```

Flooding Status:      ready
Configured Areas:    1
IGP Area[1] ID:: isis level-1
  System Information::
    Flooding Protocol:  ISIS
  Header Information::
    IGP System ID:      0001.0000.0001.00
    MPLS TE Router ID:  10.106.0.6
    Flooded Links:      1
Link ID:: 0
Link IP Address:      10.1.0.6
IGP Neighbor:         ID 0001.0000.0001.02
Admin. Weight:        10
Physical Bandwidth:   10000 kbits/sec
Max Reservable BW:    5000 kbits/sec
Downstream::
  Reservable Bandwidth[0]: 5000 kbits/sec
  Reservable Bandwidth[1]: 2000 kbits/sec
  Reservable Bandwidth[2]: 2000 kbits/sec
  Reservable Bandwidth[3]: 2000 kbits/sec
  Reservable Bandwidth[4]: 2000 kbits/sec
  Reservable Bandwidth[5]: 2000 kbits/sec
  Reservable Bandwidth[6]: 2000 kbits/sec
  Reservable Bandwidth[7]: 2000 kbits/sec
Attribute Flags:      0x00000000

```

Table 98 describes the significant fields shown in the display.

Table 98 *show mpls traffic-eng link-management advertisements Field Descriptions*

Field	Description
Flooding Status	Status of the link management flooding system.
Configured Areas	Number of the IGP areas configured.
IGP Area [1] ID	Name of the first IGP area.
Flooding Protocol	IGP that is flooding information for this area.
IGP System ID	Identification that IGP flooding uses in this area to identify this node.
MPLS TE Router ID	MPLS traffic engineering router ID.
Flooded Links	Number of links that are flooded in this area.
Link ID	Index of the link that is being described.
Link IP Address	Local IP address of this link.
IGP Neighbor	IGP neighbor on this link.
Admin. Weight	Administrative weight associated with this link.
Physical Bandwidth	Link bandwidth capacity (in kbps).
Max Reservable BW	Amount of reservable bandwidth on this link.
Reservable Bandwidth	Amount of bandwidth that is available for reservation.
Attribute Flags	Attribute flags of the link are being flooded.

Related Commands

Command	Description
show mpls traffic-eng link-management bandwidth-allocation	Displays current local link information.
show mpls traffic-eng link-management igp-neighbors	Displays IGP neighbors.
show mpls traffic-eng link-management interfaces	Displays per-interface resource and configuration information.
show mpls traffic-eng link-management summary	Displays a summary of link management information.

show mpls traffic-eng link-management bandwidth-allocation

To show current local link information, use the **show mpls traffic-eng link-management bandwidth-allocation** command in user EXEC or privileged EXEC mode.

show mpls traffic-eng link-management bandwidth-allocation [*interface-name*]

Syntax Description

<i>interface-name</i>	(Optional) Displays only tunnels that were admitted on the specified interface.
-----------------------	---

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.0(5)S	This command was introduced.
12.1(3)T	The command output was modified.

Usage Guidelines

Advertised information might differ from the current information, depending on how flooding was configured.

Examples

The following is sample output from the **show mpls traffic-eng link-management bandwidth-allocation** command:

```
Router1# show mpls traffic-eng link-management bandwidth-allocation Et4/0/1

System Information::
  Links Count:          2
  Bandwidth Hold Time: max. 15 seconds
Link ID:: Et4/0/1 (10.1.0.6)
Link Status:
  Physical Bandwidth:  10000 kbits/sec
  Max Reservable BW:  5000 kbits/sec (reserved:0% in, 60% out)
  BW Descriptors:     1
  MPLS TE Link State: MPLS TE on, RSVP on, admin-up, flooded
  Inbound Admission:  reject-huge
  Outbound Admission: allow-if-room
  Admin. Weight:      10 (IGP)
  IGP Neighbor Count: 1
  Up Thresholds:      15 30 45 60 75 80 85 90 95 96 97 98 99 100 (default)
  Down Thresholds:    100 99 98 97 96 95 90 85 80 75 60 45 30 15 (default)
```

show mpls traffic-eng link-management bandwidth-allocation

```

Downstream Bandwidth Information (kbits/sec):
  KEEP PRIORITY      BW HELD  BW TOTAL HELD  BW LOCKED  BW TOTAL LOCKED
      0              0           0           0           0
      1              0           0          3000         3000
      2              0           0           0           3000
      3              0           0           0           3000
      4              0           0           0           3000
      5              0           0           0           3000
      6              0           0           0           3000
      7              0           0           0           3000

```

Table 99 describes the significant fields shown in the display.

Table 99 *show mpls traffic-eng link-management bandwidth-allocation Field Descriptions*

Field	Description
Links Count	Number of links configured for MPLS traffic engineering.
Bandwidth Hold Time	Amount of time that bandwidth can be held.
Link ID	Interface name and IP address of the link being described.
Physical Bandwidth	Link bandwidth capacity (in bits per second).
Max Reservable BW	Amount of reservable bandwidth on this link.
BW Descriptors	Number of bandwidth allocations on this link.
MPLS TE Link State	Status of the link's MPLS traffic engineering-related functions.
Inbound Admission	Link admission policy for incoming tunnels.
Outbound Admission	Link admission policy for outgoing tunnels.
Admin. Weight	Link administrative weight.
IGP Neighbor Count	List of the IGP neighbors directly reachable over this link.
Up Thresholds	Link's bandwidth thresholds for allocations.
Down Thresholds	Link's bandwidth thresholds for deallocations.
KEEP PRIORITY	Priority levels for the link's bandwidth allocations.
BW HELD	Amount of bandwidth (in kbps) temporarily held at this priority for path messages.
BW TOTAL HELD	Bandwidth held at this priority and those above it.
BW LOCKED	Amount of bandwidth reserved at this priority.
BW TOTAL LOCKED	Bandwidth locked at this priority and those above it.

Related Commands

Command	Description
show mpls traffic-eng link-management advertisements	Displays local link information currently being flooded by MPLS traffic engineering link management into the global traffic engineering topology.
show mpls traffic-eng link-management igp-neighbors	Displays IGP neighbors.

Command	Description
show mpls traffic-eng link-management interfaces	Displays per-interface resource and configuration information.
show mpls traffic-eng link-management summary	Displays a summary of link management information.

show mpls traffic-eng link-management igp-neighbors

To show Interior Gateway Protocol (IGP) neighbors, use the **show mpls traffic-eng link-management igp-neighbors** command in user EXEC or privileged EXEC mode.

```
show mpls traffic-eng link-management igp-neighbors [igp-id [isis isis-address |
ospf ospf-id] | ip A.B.C.D]
```

Syntax Description		
<i>igp-id</i>	(Optional) Displays the IGP neighbors that are using a specified IGP identification.	
<i>isis isis-address</i>	(Optional) Displays the specified IS-IS neighbor when you display neighbors by IGP ID.	
<i>ospf ospf-id</i>	(Optional) Displays the specified OSPF neighbor when you display neighbors by IGP ID.	
<i>ip A.B.C.D</i>	(Optional) Displays the IGP neighbors that are using a specified IGP IP address.	

Command Modes	
	User EXEC Privileged EXEC

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

Examples The following is sample output from the **show mpls traffic-eng link-management igp-neighbors** command:

```
Router# show mpls traffic-eng line-management igp-neighbors

Link ID:: Et0/2
  Neighbor ID: 0000.0024.0004.02 (area: isis level-1, IP: 0.0.0.0)
Link ID:: PO1/0/0
  Neighbor ID: 0000.0026.0001.00 (area: isis level-1, IP: 170.1.1.2)
```

[Table 100](#) describes the significant fields shown in the display.

Table 100 show mpls traffic-eng link-management igp-neighbors Field Descriptions

Field	Description
Link ID	Link by which the neighbor is reached.
Neighbor ID	IGP identification information for the neighbor.

Related Commands	Command	Description
	show mpls traffic-eng link-management advertisements	Displays local link information currently being flooded by MPLS traffic engineering link management into the global traffic engineering topology.
	show mpls traffic-eng link-management bandwidth-allocation	Displays current local link information.
	show mpls traffic-eng link-management interfaces	Displays per-interface resource and configuration information.
	show mpls traffic-eng link-management summary	Displays a summary of link management information.

show mpls traffic-eng link-management interfaces

To show interface resource and configuration information, use the **show mpls traffic-eng link-management interfaces** command in user EXEC or privileged EXEC mode.

show mpls traffic-eng link-management interfaces [*interface-name*]

Syntax Description	<i>interface-name</i> (Optional) Displays information only for the specified interface.
---------------------------	---

Command Modes	User EXEC Privileged EXEC
----------------------	------------------------------

Command History	Release	Modification
	12.0(5)S	This command was introduced.
	12.1(3)T	The command output was modified.

Usage Guidelines	Displays resource and configuration information for all configured interfaces.
-------------------------	--

Examples	The following is sample output from the show mpls traffic-eng link-management interfaces command:
-----------------	--

```
Router1# show mpls traffic-eng link-management interfaces Et4/0/1

System Information::
  Links Count:          2
Link ID:: Et4/0/1 (10.1.0.6)
  Link Status:
    Physical Bandwidth: 10000 kbits/sec
    Max Reservable BW:  5000 kbits/sec (reserved:0% in, 60% out)
    MPLS TE Link State: MPLS TE on, RSVP on, admin-up, flooded
    Inbound Admission:  reject-huge
    Outbound Admission: allow-if-room
    Admin. Weight:      10 (IGP)
    IGP Neighbor Count: 1
    IGP Neighbor:       ID 0001.0000.0001.02, IP 0.0.0.0 (Up)
  Flooding Status for each configured area [1]:
    IGP Area[1]: isis level-1: flooded
```

[Table 101](#) describes the significant fields shown in the display.

Table 101 *show mpls traffic-eng link management interfaces Field Descriptions*

Field	Description
Links Count	Number of links that were enabled for use with Multiprotocol Label Switching (MPLS) traffic engineering.
Link ID	Index of the link.

Table 101 show mpls traffic-eng link management interfaces Field Descriptions (continued)

Field	Description
Physical Bandwidth	Link's bandwidth capacity (in kbps).
Max Reservable BW	Amount of reservable bandwidth on this link.
MPLS TE Link State	The status of the MPLS link.
Inbound Admission	Link admission policy for inbound tunnels.
Outbound Admission	Link admission policy for outbound tunnels.
Admin. Weight	Administrative weight associated with this link.
IGP Neighbor Count	Number of Interior Gateway Protocol (IGP) neighbors directly reachable over this link.
IGP Neighbor	IGP neighbor on this link.
Flooding Status for each configured area	Flooding status for the specified configured area.

Related Commands

Command	Description
show mpls traffic-eng link-management advertisements	Displays local link information currently being flooded by MPLS traffic engineering link management into the global traffic engineering topology.
show mpls traffic-eng link-management bandwidth-allocation	Displays current local link information.
show mpls traffic-eng link-management igp-neighbors	Displays IGP neighbors.
show mpls traffic-eng link-management summary	Displays a summary of link management information.

show mpls traffic-eng link-management summary

To show a summary of link management information, use the **show mpls traffic-eng link-management summary** command in user EXEC or privileged EXEC mode.

show mpls traffic-eng link-management summary [*interface-name*]

Syntax Description	<i>interface-name</i> (Optional) Displays information only for the specified interface.						
Command Modes	User EXEC Privileged EXEC						
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>12.0(5)S</td> <td>This command was introduced.</td> </tr> <tr> <td>12.1(3)T</td> <td>The command output was modified.</td> </tr> </tbody> </table>	Release	Modification	12.0(5)S	This command was introduced.	12.1(3)T	The command output was modified.
Release	Modification						
12.0(5)S	This command was introduced.						
12.1(3)T	The command output was modified.						

Examples

The following is sample output from the **show mpls traffic-eng link-management summary** command:

```
Router1# show mpls traffic-eng link-management summary

System Information::
  Links Count:          2
  Flooding System:     enabled
IGP Area ID:: isis level-1
  Flooding Protocol:   ISIS
  Flooding Status:     data flooded
  Periodic Flooding:   enabled (every 180 seconds)
  Flooded Links:       1
  IGP System ID:       0001.0000.0001.00
  MPLS TE Router ID:   10.106.0.6
  IGP Neighbors:       1
Link ID:: Et4/0/1 (10.1.0.6)
  Link Status:
    Physical Bandwidth: 10000 kbits/sec
    Max Reservable BW:  5000 kbits/sec (reserved:0% in, 60% out)
    MPLS TE Link State: MPLS TE on, RSVP on, admin-up, flooded
    Inbound Admission:  reject-huge
    Outbound Admission: allow-if-room
    Admin. Weight:      10 (IGP)
    IGP Neighbor Count: 1
Link ID:: AT0/0.2 (10.42.0.6)
  Link Status:
    Physical Bandwidth: 155520 kbits/sec
    Max Reservable BW:  5000 kbits/sec (reserved:0% in, 0% out)
    MPLS TE Link State: MPLS TE on, RSVP on
    Inbound Admission:  allow-all
    Outbound Admission: allow-if-room
    Admin. Weight:      10 (IGP)
    IGP Neighbor Count: 0
```

Table 102 describes the significant fields shown in the display.

Table 102 *show mpls traffic-eng link-management summary Field Descriptions*

Field	Description
Links Count	Number of links configured for MPLS traffic engineering.
Flooding System	Enable status of the MPLS traffic engineering flooding system.
IGP Area ID	Name of the IGP area being described.
Flooding Protocol	IGP being used to flood information for this area.
Flooding Status	Status of flooding for this area.
Periodic Flooding	Status of periodic flooding for this area.
Flooded Links	Number of links that were flooded.
IGP System ID	IGP for this node associated with this area.
MPLS TE Router ID	MPLS traffic engineering router ID for this node.
IGP Neighbors	Number of reachable IGP neighbors associated with this area.
Link ID	Interface name and IP address of the link being described.
Physical Bandwidth	Link bandwidth capacity (in kbps).
Max Reservable BW	Amount of reservable bandwidth on this link.
MPLS TE Link State	Status of the link's MPLS traffic engineering-related functions.
Inbound Admission	Link admission policy for incoming tunnels.
Outbound Admission	Link admission policy for outgoing tunnels.
Admin. Weight	Link administrative weight.
IGP Neighbor Count	List of the IGP neighbors directly reachable over this link.

Related Commands

Command	Description
show mpls traffic-eng link-management advertisements	Displays local link information currently being flooded by MPLS traffic engineering link management into the global traffic engineering topology.
show mpls traffic-eng link-management bandwidth-allocation	Displays current local link information.
show mpls traffic-eng link-management igp-neighbors	Displays IGP neighbors.
show mpls traffic-eng link-management interfaces	Displays per-interface resource and configuration information.