



MPLS Forwarding Commands



Note All commands applicable for the Cisco NCS 5500 Series Router are also supported on the Cisco NCS 540 Series Router that is introduced from Cisco IOS XR Release 6.3.2. References to earlier releases in Command History tables apply to only the Cisco NCS 5500 Series Router.



- Note**
- Starting with Cisco IOS XR Release 6.6.25, all commands applicable for the Cisco NCS 5500 Series Router are also supported on the Cisco NCS 560 Series Routers.
 - Starting with Cisco IOS XR Release 6.3.2, all commands applicable for the Cisco NCS 5500 Series Router are also supported on the Cisco NCS 540 Series Router.
 - References to releases before Cisco IOS XR Release 6.3.2 apply to only the Cisco NCS 5500 Series Router.
 - Cisco IOS XR Software Release 7.0.1 specific updates are not applicable for the following variants of Cisco NCS 540 Series Routers:
 - N540-28Z4C-SYS-A
 - N540-28Z4C-SYS-D
 - N540X-16Z4G8Q2C-A
 - N540X-16Z4G8Q2C-D
 - N540X-16Z8Q2C-D
 - N540-12Z20G-SYS-A
 - N540-12Z20G-SYS-D
 - N540X-12Z16G-SYS-A
 - N540X-12Z16G-SYS-D

This module describes the commands used to configure and use Multiprotocol Label Switching (MPLS) forwarding.

For detailed information about MPLS concepts, configuration tasks, and examples, see *MPLS Configuration Guide for Cisco NCS 5500 Series Routers*, *MPLS Configuration Guide for Cisco NCS 540 Series Routers*, and *MPLS Configuration Guide*.

- [clear mpls forwarding counters, on page 3](#)
- [mpls ip-ttl-propagate, on page 5](#)
- [mpls label range, on page 7](#)
- [mpls label-security, on page 9](#)
- [show mpls ea interfaces, on page 10](#)
- [show mpls forwarding, on page 11](#)
- [show mpls forwarding tunnels, on page 15](#)
- [show mpls forwarding exact-route, on page 17](#)
- [show mpls forwarding label-security interface, on page 21](#)
- [show mpls forwarding label-security summary location, on page 22](#)
- [show mpls forwarding labels, on page 23](#)
- [show mpls forwarding summary, on page 25](#)
- [show mpls interfaces, on page 28](#)
- [show mpls label range, on page 30](#)
- [show mpls label table, on page 31](#)
- [show mpls lsd applications, on page 33](#)
- [show mpls lsd clients, on page 35](#)
- [show mpls lsd forwarding labels, on page 37](#)
- [show mpls lsd forwarding summary, on page 38](#)
- [show mpls traffic-eng fast-reroute database, on page 39](#)
- [show mpls traffic-eng fast-reroute log, on page 43](#)

clear mpls forwarding counters

To clear (set to zero) the MPLS forwarding counters, use the **clear mpls forwarding counters** command in XR EXEC mode.

clear mpls forwarding counters

Syntax Description This command has no arguments or keywords.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History

Release	Modification
Release 6.0	This command was introduced.

Usage Guidelines Use the **clear mpls forwarding counters** command to set all MPLS forwarding counters to zero so that you can easily see the future changes.

Task ID	Task ID	Operations
	mpls-ldp	read, write
	mpls-static	read, write

Example:

This a test.

Examples

The following example shows sample output before and after clearing all counters:

```
RP/0/RP0/CPU0:router# show mpls forwarding
```

Local Label	Outgoing Label	Prefix or ID	Outgoing Interface	Next Hop	Bytes Switched
10001	10002	No ID	BE262	10.1.1.62	0
10003	10004	No ID	BE264	10.1.1.70	0
10005	10006	No ID	BE266	10.1.1.78	0
10007	10008	No ID	BE268	10.1.1.86	0
10009	10010	No ID	BE270	10.1.1.94	0
10011	10012	No ID	BE272	10.1.1.102	0
10013	10014	No ID	BE274	10.1.1.110	0
10015	10016	No ID	BE276	10.1.1.118	0
10017	10018	No ID	BE141	10.13.1.42	0
10022	10023	No ID	BE73	10.17.1.10	0
10026	20001	No ID	Te0/4/0/0/1	10.11.106.2	0
24000	Pop	SR Adj (idx 1)	Hu0/7/0/35	10.11.150.2	0

clear mpls forwarding counters

```

24001 Pop          SR Adj (idx 3)   Hu0/7/0/35     10.11.150.2    0
24002 Pop          SR Adj (idx 1)   BE206          10.11.1.58     0
24003 Pop          SR Adj (idx 3)   BE206          10.11.1.58     0

```

RP/0/RP0/CPU0:router# **show mpls forwarding**

Local Label	Outgoing Label	Prefix or ID	Outgoing Interface	Next Hop	Bytes Switched
24000	Pop	TE: 65000	BE12	10.0.14.2	0
24001	Pop	TE: 128	BE12	10.0.14.2	0
	Pop	TE: 128	tt65001	10.0.14.2	0 (!)
24002	Pop	TE: 3174	BE12	10.0.14.2	0
	Pop	TE: 3174	tt65001	10.0.14.2	0 (!)
24003	Pop	TE: 1443	BE12	10.0.14.2	0
	Pop	TE: 1443	tt65001	10.0.14.2	0 (!)
24005	Pop	TE: 3009	BE12	10.0.14.2	0
	Pop	TE: 3009	tt65001	10.0.14.2	0 (!)
24006	Pop	TE: 10	BE12	10.0.14.2	0
	Pop	TE: 10	tt65001	10.0.14.2	0 (!)
24007	Pop	TE: 63	BE12	10.0.14.2	0
	Pop	TE: 63	tt65001	10.0.14.2	0 (!)
24010	Pop	TE: 4848	BE12	10.0.14.2	0
	Pop	TE: 4848	tt65001	10.0.14.2	0 (!)
24012	Pop	TE: 1455	BE12	10.0.14.2	0
	Pop	TE: 1455	tt65001	10.0.14.2	0 (!)
24013	Pop	TE: 2932	BE12	10.0.14.2	0
	Pop	TE: 2932	tt65001	10.0.14.2	0 (!)
24014	Pop	TE: 2967	BE12	10.0.14.2	0
	Pop	TE: 2967	tt65001	10.0.14.2	0 (!)

RP/0/RP0/CPU0:router# **clear mpls forwarding counters**

mpls ip-ttl-propagate

To configure the behavior controlling the propagation of the IP Time-To-Live (TTL) field to and from the MPLS header, use the **mpls ip-ttl-propagate** command in XR Config mode. To return to the default behavior, use the **no** form of this command.

```
mpls ip-ttl-propagate disable [forwarded | local]
no mpls ip-ttl-propagate
```

Syntax Description	disable	forwarded	local
	Disables the propagation of IP TTL to and from the MPLS header for both forwarded and local packets.	(Optional) Disables the propagation of IP TTL to and from the MPLS header for only the forwarded packets. This prevents the traceroute command from displaying the MPLS-enabled nodes beyond the device under the configuration.	(Optional) Disables the propagation of IP TTL to the MPLS header for only locally generated packets. This prevents the traceroute command from displaying the MPLS-enabled nodes beyond the device under the configuration.

Command Default Enabled

Command Modes XR Config mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines By default, the IP TTL is propagated to the MPLS header when IP packets enter the MPLS domain. Within the MPLS domain, the MPLS TTL is decremented at each MPLS hop. When an MPLS encapsulated IP packet exits the MPLS domain, the MPLS TTL is propagated to the IP header. When propagation is disabled, the MPLS TTL is set to 255 during the label imposition phase and the IP TTL is not altered.

Task ID	Task ID	Operations
	mpls-te	read, write
	mpls-ldp	read, write

Examples

The following example shows how to disable IP TTL propagation:

```
RP/0/RP0/CPU0:router(config)# mpls ip-ttl-propagate disable
```

The following example shows how to disable IP TTL propagation for forwarded MPLS packets:

```
RP/0/RP0/CPU0:router(config)# mpls ip-ttl-propagate disable forwarded
```

The following example shows how to disable IP TTL propagation for locally generated MPLS packets:

```
RP/0/RP0/CPU0:router(config)# mpls ip-ttl-propagate disable local
```

mpls label range

To configure the dynamic range of local labels available for use on packet interfaces, use the **mpls label range** command in XR Config mode. To return to the default behavior, use the **no** form of this command.

mpls label range table *table-id* *minimum* *maximum*
no mpls label range table *table-id* *minimum* *maximum*

Syntax Description	
table <i>table-id</i>	Identifies a specific label table; the global label table has table-id = 0. If no table is specified, the global table is assumed. Currently, you can specify table 0 only.
<i>minimum</i>	Smallest allowed label in the label space. Default is 16000.
<i>maximum</i>	Largest allowed label in the label space. Default is 1048575.

Command Default	
<i>table-id</i> : 0	
<i>minimum</i> : 16000	
<i>maximum</i> : 1048575	

Command Modes	
	XR Config mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines	
	After configuring the mpls label range command, restart the router for the configuration to take effect.
	The label range defined by the mpls label range command is used by all MPLS applications that allocate local labels (for dynamic label switching Label Distribution Protocol [LDP], MPLS traffic engineering, and so on).
	Labels 0 through 15 are reserved by the Internet Engineering Task Force (IETF) (see the RFC 3032 reference for details) and cannot be included in the range using the mpls label range command.
	The maximum allowed label limit is 1000000 when Enhanced Ethernet Line Card is used.



Note	
	<ul style="list-style-type: none"> Labels outside the current range and which are allocated by MPLS applications remain in circulation until released. The maximum labels that are available are 144K.

Task ID	Task ID	Operations
	mpls-te	read, write

Task ID Operations

mpls-ldp read,
 write

Examples

The following example shows how to configure the size of the local label space using a *minimum* of 16200 and a *maximum* of 120000:

```
RP/0/RP0/CPU0:router# configure  
RP/0/RP0/CPU0:router(config)# mpls label range 16200 120000
```


mpls label-security

To configure the MPLS label security for the interface, use the **mpls label-security** command in interface configuration mode.

mpls label-security multi-label-packet [drop] rpf

Syntax Description	
multi-label-packet	Handles incoming packets with multiple labels on the stack.
drop	Drops packets with multiple labels on the stack.
rpf	Checks for RPF label on incoming packets.

Command Modes Interface configuration.

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines The optional keywords and arguments described allow display of an MPLS label security information.

Task ID	Task ID	Operations
	mpls-te	read
	mpls-ldp	read
	mpls-static	read

Examples

This example shows how to configure MPLS label RPF check:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)#interface tunnel-te 1
RP/0/RP0/CPU0:router(config-if)#mpls label-security rpf
```

show mpls ea interfaces

To display the interface label security information, use the **show mpls ea interfaces** command in XR EXEC mode.

show mpls ea interface [*location node-id*]

Syntax Description	location <i>node-id</i>	Displays the interfaces on which MPLS is enabled.
Command Modes	XR EXEC mode	
Command History	Release	Modification
	Release 6.0	This command was introduced.
Usage Guidelines	The keywords and arguments described allow display of the interface label security information.	
Task ID	Task ID	Operations
	mpls-te	read
	mpls-ldp	read
	mpls-static	read

Examples

The following sample output is from the **show mpls ea interfaces** command and specific interface and location:

```
RP/0/RP0/CPU0:router# show mpls ea interfaces location 0/1/CPU0
Interface      IFH          MTU  Flags      Type
-----
Interface      IFH          MTU
-----
Te0/0/0/1      0x08000040   1500
Te0/0/0/1.2    0x08001d90   1500
Te0/0/0/1.3    0x08001d98   1500
Te0/0/0/1.4    0x08001da0   1500
Te0/0/0/1.5    0x08001da8   1500
Te0/0/0/1.6    0x08001db0   1500
Te0/0/0/1.7    0x08001db8   1500
Te0/0/0/1.8    0x08001dc0   1500
Te0/0/0/1.9    0x08001dc8   1500
Te0/0/0/1.10   0x08001dd0   1500
Te0/0/0/1.11   0x08001dd8   1500
Te0/0/0/1.12   0x08001de0   1500
Te0/0/0/1.13   0x08001de8   1500
Te0/0/0/1.14   0x08001df0   1500
Te0/0/0/1.15   0x08001df8   1500
Te0/0/0/1.16   0x08001e00   1500
```

show mpls forwarding

To display the contents of the MPLS Label Forwarding Information Base (LFIB), use the **show mpls forwarding** command in XR EXEC mode.

```
show mpls forwarding [detail] [hardware {ingress | egress}] [interface type interface-path-id]
[location node-id] [labels low-value [high-value] ] [prefix {network/mask | ipv4 unicast
network/mask} ] [private] [summary] [tunnels tunnel-id] [vrf vrf-name]
```

Syntax Description	
detail	(Optional) Displays information in long form (includes length of encapsulation, length of Media Access Control [MAC] string, maximum transmission unit [MTU], Packet switched, and label stack).
hardware	(Optional) Displays the hardware location entry.
ingress	(Optional) Reads information from the ingress PSE.
egress	(Optional) Reads information from the egress PSE.
interface	(Optional) Displays information for the specified interface.
<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or a virtual interface. Note Use the show interfaces command to see a list of all possible interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
labels <i>low-value</i> [<i>high-value</i>]	(Optional) Entries with a local labels range. Ranges for both <i>low-value</i> and <i>high-value</i> are 0 to 1048575.
location <i>node-id</i>	(Optional) Displays hardware resource counters on the designated node.
prefix <i>network/mask /length</i>	(Optional) Displays the destination address and mask/prefix length. Note The forward slash (/) between <i>network</i> and <i>mask</i> is required.
ipv4 unicast	(Optional) Displays the IPv4 unicast address.
private	(Optional) Displays private information.
summary	(Optional) Displays summarized information.
tunnels <i>tunnel-id</i>	(Optional) Displays entries either for a specified label switch path (LSP) tunnel or all LSP tunnel entries.
vrf <i>vrf-name</i>	(Optional) Displays entries for VPN routing and forwarding (VRF).

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines The optional keywords and arguments described allow specification of a subset of the entire MPLS forwarding table.



Note This router does not support label accounting for vrf labels. Instead, it supports accounting for the IGP and LDP labels. As a result, the Bytes Switched counter is 0 for the **show mpls forwarding vrf** command.



Note When the **show mpls forwarding detail** command is executed with the **location** keyword (for example, with the address, 0/1/cpu0), it displays the forwarding information available on this node. If this node hosts a displayed interface, then the FIB displays a configured MTU; otherwise, it displays the default value of 1500. This is because in Cisco IOS XR software, interface information is available only on nodes hosting the interface. Note that for bundle interfaces, the information is available in line cards with bundle-member links. If the location is not specified, the FIB displays the data from the node where the interface is created. For physical interfaces, this **location** keyword value would match the actual address; therefore, FIB displays correct information. It is different in the case of bundles--bundles are created on RP, but located on LC(s); therefore, you would see default values. This is also applicable to any per-interface data; for example, adjacencies.

The *node-id* argument is entered in the *rack/slot/module* notation.

Task ID	Task ID	Operations
	mpls-te	read, write
	mpls-ldp	read, write
	mpls-static	read, write

Examples

The following sample output is from the **show mpls forwarding** command using the **location** keyword and a specific node ID:

```
RP/0/RP0/CPU0:router# show mpls forwarding location 0/6/CPU0
Local   Outgoing   Prefix      Outgoing   Next Hop    Bytes
Label  Label      or ID      Interface  Hop         Switched
-----
24000  Pop        TE: 65000  BE12       10.0.14.2   0
24001  Pop        TE: 128    BE12       10.0.14.2   0
        Pop        TE: 128    tt65001    10.0.14.2   0          (!)
```

```

24002 Pop      TE: 3174      BE12      10.0.14.2  0
      Pop      TE: 3174      tt65001   10.0.14.2  0      (!)
24003 Pop      TE: 1443      BE12      10.0.14.2  0
      Pop      TE: 1443      tt65001   10.0.14.2  0      (!)
24005 Pop      TE: 3009      BE12      10.0.14.2  0
      Pop      TE: 3009      tt65001   10.0.14.2  0      (!)
24006 Pop      TE: 10        BE12      10.0.14.2  0
      Pop      TE: 10        tt65001   10.0.14.2  0      (!)
24007 Pop      TE: 63        BE12      10.0.14.2  0
      Pop      TE: 63        tt65001   10.0.14.2  0      (!)
24010 Pop      TE: 4848      BE12      10.0.14.2  0
      Pop      TE: 4848      tt65001   10.0.14.2  0      (!)
24012 Pop      TE: 1455      BE12      10.0.14.2  0
      Pop      TE: 1455      tt65001   10.0.14.2  0      (!)
24013 Pop      TE: 2932      BE12      10.0.14.2  0
      Pop      TE: 2932      tt65001   10.0.14.2  0      (!)
24014 Pop      TE: 2967      BE12      10.0.14.2  0
      Pop      TE: 2967      tt65001   10.0.14.2  0      (!)

```

The following sample output shows detailed information for the LSP tunnels:

```
RP/0/RP0/CPU0:router# show mpls forwarding prefix 10.0.143.0/24 detail
```

```

Local  Outgoing  Prefix      Outgoing  Next Hop    Bytes
Label  Label     or ID       Interface  Hop         Switched
-----
25156  24715     10.0.143.0/24  BE1       10.1.1.1    0
      Updated: Feb 1 11:30:20.150
      Version: 84285, Priority: 3
      Label Stack (Top -> Bottom): { 24715 }
      NHID: 0x0, Encap-ID: 0xe3a, Path idx: 0, Backup path idx: 0, Weight: 0
      MAC/Encaps: 14/18, MTU: 1500
      Packets Switched: 0

```

This table describes the significant fields shown in the display.

Table 1: show mpls forwarding Field Descriptions

Field	Description
Local Label	Label assigned by this router.
Outgoing Label	Label assigned by the next hop or downstream peer. Some of the entries that display in this column are: Unlabeled No label for the destination from the next hop, or label switching is not enabled on the outgoing interface. Pop Label Next hop advertised an implicit-null label for the destination.
Prefix or Tunnel ID	Address or tunnel to which packets with this label are going.
Outgoing Interface	Interface through which packets with this label are sent.
Next Hop	IP address of neighbor that assigned the outgoing label.

Field	Description
Bytes Switched	Number of bytes switched with this incoming label.
TO	Timeout: Indicated by an "*" if entry is being timed out in forwarding.
Mac/Encaps	Length in bytes of Layer 2 header, and length in bytes of packet encapsulation, including Layer 2 header and label header.
MTU	MTU ¹ of labeled packet.
Label Stack	All the outgoing labels on the forwarded packet.
Packets Switched	Number of packets switched with this incoming label.
Label switching	Number of Label switching LFIB ² forwarding entries.
IPv4 label imposition	Number of IPv4 label imposition forwarding entries (installed at ingress LSR).
MPLS TE tunnel head	Number of forwarding entries (installed at ingress LSR) on MPLS TE tunnel head.
MPLS TE fast-reroute	Number of forwarding entries (installed at PLR) for MPLS-TE fast reroute.
Forwarding updates	Number of forwarding updates sent from LSD (RP/DRP) to LFIB/MPLS (RP/DRP/LC) using BCDL mechanism, indicating the total number of updates and total number of BCDL messages.
Labels in use	Local labels in use (installed in LFIB). These usually indicate the lowest and highest label in use (allocated by applications). Furthermore, some reserved labels, such as explicit-nullv4, explicit-nullv6, are installed in the forwarding plane. The label range is 0 to 15.

¹ MTU = Maximum Transmission Unit.

² LFIB = Label Forwarding Information Base.

show mpls forwarding tunnels

To display the contents of the **MPLS** forwarding tunnel, use the **show mpls forwarding tunnel** command in XR EXEC mode.

```
show mpls forwarding tunnels [detail][tunnels tunnel-id] [vrf vrf-name]
```

Syntax Description	detail	(Optional) Displays information in long form (includes length of encapsulation, length of Media Access Control [MAC] string, maximum transmission unit [MTU], Packet switched, and label stack).
	tunnels tunnel-id	(Optional) Displays entries either for a specified label switch path (LSP) tunnel or all LSP tunnel entries.
	vrf vrf-name	(Optional) Displays entries for VPN routing and forwarding (VRF).

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines The optional keywords and arguments described allow specification of a subset of the entire MPLS forwarding table. This router does not support label accounting for vrf labels. Instead, it supports accounting for the IGP and LDP labels. As a result, the Bytes Switched counter is 0 for the **show mpls forwarding vrf** command.



Note When the **show mpls forwarding tunnels detail** command is executed with the **location** keyword

The *node-id* argument is entered in the *rack/slot/module* notation.

Task ID	Task ID	Operations
	mpls-te	read, write
	mpls-ldp	read, write
	mpls-static	read, write

Examples

The following sample output is from the **show mpls forwarding tunnels** command using the **location** keyword and a specific node ID:

show mpls forwarding tunnels

show mpls forwarding tunnels

```
RP/0/RSP0/CPU0:PE1#sh mpls forwarding tunnels 1999 detail
```

```
Thu Jul 23 22:56:09.726 PDT
```

Tunnel Name	Outgoing Label	Outgoing Interface	Next Hop	Bytes Switched
tt1999	50045	BE10	point2point	0

Updated: Jul 23 20:04:57.416
 Version: 82681, Priority: 2
 Label Stack (Top -> Bottom): { 50045 }
 Local Label: 27972
 NHID: 0x0, Path idx: 0, Backup path idx: 0, Weight: 0
 MAC/Encaps: 14/18, MTU: 1500
 Packets Switched: 0

Interface Handle: 0x0801f4a0, Local Label: 27972

Forwarding Class: 0, Weight: 0

Packets/Bytes Switched: 7045837/7116295370

```
RP/0/RSP0/CPU0:PE1#sh mpls forwarding tunnels 1999 detail location 0/0/CPU0
```

```
Thu Jul 23 22:56:14.526 PDT
```

Tunnel Name	Outgoing Label	Outgoing Interface	Next Hop	Bytes Switched
tt1999	50045	BE10	point2point	0

Updated: Jul 23 20:04:57.640
 Version: 82681, Priority: 2
 Label Stack (Top -> Bottom): { 50045 }
 Local Label: 27972
 NHID: 0x0, Path idx: 0, Backup path idx: 0, Weight: 0
 MAC/Encaps: 14/18, MTU: 1500
 Packets Switched: 0

Interface Handle: 0x0801f4a0, Local Label: 27972

Forwarding Class: 0, Weight: 0

Packets/Bytes Switched: 7045837/7116295370

```
RP/0/RSP0/CPU0:PE1#sh mpls forwarding tunnels 1999
```

```
Thu Jul 23 22:56:19.717 PDT
```

Tunnel Name	Outgoing Label	Outgoing Interface	Next Hop	Bytes Switched
tt1999	50045	BE10	point2point	0

show mpls forwarding exact-route

To display the exact path for the source and destination address pair, use the **show mpls forwarding exact-route** command in XR EXEC mode.

```
show mpls forwarding exact-route label label-number {bottom-label value | ipv4 source-address
destination-address | ipv6source-addressdestination-address} [detail] [protocol protocol source-port
source-port destination-port destination-port ingress-interface type interface-path-id] [location
node-id] [policy-class value] [hardware {ingress | egress}]
```

Syntax Description		
label <i>label-number</i>		Displays the Label Number. Range is 0 to 1048575.
bottom-label <i>value</i>		Displays the bottom label value. Range is 0 to 1048575.
ipv4 <i>source-address</i> <i>destination-address</i>		Displays the exact path for IPv4 payload. The IPv4 source address in x.x.x.x format. The IPv4 destination address in x.x.x.x format.
ipv6 <i>source-address</i> <i>destination-address</i>		Displays the exact path for IPv6 payload. The IPv6 source address in x::x format. The IPv6 destination address in x::x format.
detail		(Optional) Displays detailed information.
protocol <i>protocol</i>		(Optional) Displays the specified protocol for the route.
source-port <i>source-port</i>		Sets the UDP source port. The range is from 0 to 65535.
destination-port <i>destination-port</i>		Sets the UDP destination port. The range is from 0 to 65535.
ingress-interface		Sets the ingress interface.
<i>type</i>		Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>		Physical interface or a virtual interface.
	Note	Use the show interfaces command to see a list of all possible interfaces currently configured on the router.
		For more information about the syntax for the router, use the question mark (?) online help function.
location <i>node-id</i>		(Optional) Displays hardware resource counters on the designated node.
policy-class <i>value</i>		(Optional) Displays the policy-based tunnel selection (PBTS) to direct traffic into specific TE tunnels. The policy-class attribute maps the correct traffic class to this policy. The range for the policy-class value is from 1 to 7.
hardware		(Optional) Displays the hardware location entry.
ingress		(Optional) Reads information from the ingress PSE.
egress		(Optional) Reads information from the egress PSE.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History

Release	Modification
Release 6.0	This command was introduced.

Usage Guidelines The **show mpls forwarding exact-route** command displays information in long form and includes the following information:

- Encapsulation length
- Media Access Control (MAC) string length
- Maximum transmission unit (MTU)
- Packet switching information
- Label stacking information



- Note**
- If you use the show mpls forwarding exact-route command for a GRE MPLS packet, it shows incorrect egress locations.
 - If you use the show mpls forwarding exact-route command for a GRE MPLS packet, it shows incorrect egress locations.

Task ID	Task ID	Operations
	mpls-te	read, write
	mpls-ldp	read, write
	mpls-static	read, write

Examples

The following shows a sample output from the **show mpls forwarding exact-route** command:

```
RP/0/RP0/CPU0:router# show mpls forwarding exact-route label 24075 ipv4 11.255.255.1
12.0.14.1 protocol tcp sou$
```

```
Local  Outgoing  Prefix          Outgoing      Next Hop      Bytes
Label  Label      or ID          Interface     Interface     Switched
-----
24075  Pop        TE: 4131       BE12          12.0.14.2    N/A
      Via: BE12, Next Hop: 12.0.14.2
      Label Stack (Top -> Bottom): { Imp-Null }
      NHID: 0x0, Encap-ID: 0xab8, Path idx: 0, Backup path idx: 0, Weight: 0
      MAC/Encaps: 14/14, MTU: 1500
```

This table describes the significant fields shown in the display.

Table 2: show mpls forwarding exact-route Field Descriptions

Field	Description
Local Label	Label assigned by this router.
Outgoing Label	Label assigned by the next hop or downstream peer. Some of the entries that display in this column are: Unlabeled No label for the destination from the next hop, or label switching is not enabled on the outgoing interface. Pop Label Next hop advertised an implicit-null label for the destination.
Prefix or Tunnel ID	Address or tunnel to which packets with this label are going.
Outgoing Interface	Interface through which packets with this label are sent.
Next Hop	IP address of neighbor that assigned the outgoing label.
Bytes Switched	Number of bytes switched with this incoming label.
TO	Timeout: Indicated by an “*” if entry is being timed out in forwarding.
MAC/Encaps	Length in bytes of Layer 2 header, and length in bytes of packet encapsulation, including Layer 2 header and label header.
MTU	MTU ³ of labeled packet.
Label Stack	All the outgoing labels on the forwarded packet.
Packets Switched	Number of packets switched with this incoming label.
Label switching	Number of Label switching LFIB ⁴ forwarding entries.
IPv4 label imposition	Number of IPv4 label imposition forwarding entries (installed at ingress LSR).
MPLS TE tunnel head	Number of forwarding entries (installed at ingress LSR) on MPLS TE tunnel head.
MPLS TE fast-reroute	Number of forwarding entries (installed at PLR) for MPLS-TE fast reroute.
Forwarding updates	Number of forwarding updates sent from LSD (RP/DRP) to LFIB/MPLS (RP/DRP/LC) using BCDL mechanism, indicating the total number of updates and total number of BCDL messages.
Labels in use	Local labels in use (installed in LFIB). These usually indicate the lowest and highest label in use (allocated by applications). Furthermore, some reserved labels, such as explicit-nullv4, explicit-nullv6, are installed in the forwarding plane. The label range is 0 to 15.

³ MTU = Maximum Transmission Unit.

⁴ LFIB = Label Forwarding Information Base.

show mpls forwarding label-security interface

To display the contents of the MPLS label interface security information, use the **show mpls forwarding label-security interface** command in XR EXEC mode.

```
show mpls forwarding label-security[interface type interface-path-id] [location node-id]
```

Syntax Description	interface	(Optional) Displays information for the specified interface.
	<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
	<i>interface-path-id</i>	Physical interface or a virtual interface. Note Use the show interfaces command to see a list of all possible interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
	location <i>node-id</i>	(Optional) Displays hardware resource counters on the designated node.

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines The optional keywords and arguments described allow display of an MPLS label security information.

Task ID	Task ID	Operations
	mpls-te	read
	mpls-ldp	read
	mpls-static	read

Examples

The following sample output is from the **show mpls forwarding label-security interface** command and specific interface and location:

```
RP/0/RP0/CPU0:router# show mpls forwarding label-security interface HundredGigE location 0/1/CPU0
```

show mpls forwarding label-security summary location

To display the contents of the MPLS label security information summary, use the **show mpls forwarding label-security summary location** command in XR EXEC mode.

show mpls forwarding label-security summary location *node-id*

Syntax Description	location <i>node-id</i>	Displays label security information on the designated node.
---------------------------	--------------------------------	---

Command Modes	XR EXEC mode
----------------------	--------------

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines	The optional keywords and arguments described allow display of an MPLS label security information.
-------------------------	--

Task ID	Task ID	Operations
	mpls-te	read
	mpls-ldp	read
	mpls-static	read

Examples

The following sample output is from the **show mpls forwarding label-security summary location** command and a specific location:

```
RP/0/RP0/CPU0:router# show mpls forwarding label-security summary location 0/1/CPU0
```

show mpls forwarding labels

To display the contents of the MPLS label information, use the **show mpls forwarding labels** command in XR EXEC mode.

show mpls forwarding [**labels** *low-value high-value*] [**detail**] [**rpf**]

Syntax Description	labels <i>low-value high-value</i>	(Optional) Entries with a local labels range. Ranges for <i>low-value</i> is 0 and <i>high-value</i> is 0 1048575.
	detail	
	rpf	(Optional) Displays label RPF information.
		Note This will be supported in a future release of Cisco IOS XR software.

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.
	Release 6.6.1	The command displays statistics information.

- Usage Guidelines**
- The optional keywords and arguments described allow display of MPLS label security and RPF information.
 - The **show mpls forwarding labels** command displays per-label statistics at “ingress” for Segment Routing labels only if it's enabled using the **hw-module profile stats ingress-sr** command.
 - For NCS 560 series routers, the command output doesn't include the per-label statistics information even after enabling the **hw-module profile stats ingress-sr** command.

Task ID	Task ID	Operations
	mpls-te	read
	mpls-ldp	read
	mpls-static	read

Examples

The following sample output is from the **show mpls forwarding labels** command using the **rpf**:

```
RP/0/RP0/CPU0:router# show mpls forwarding labels rpf
Forwarding entries:
  Label switching: 0, protected: 0
  MPLS TE tunnel head: 0, protected: 0
  MPLS TE midpoint: 0, protected: 0
  MPLS TE internal: 0, protected: 0
  MPLS P2MP TE tunnel head: 0
  MPLS P2MP TE tunnel midpoint/tail: 0
  MPLS P2MP MLDP tunnel head: 0
  MPLS P2MP MLDP tunnel midpoint/tail: 0
Forwarding updates:
  messages: 2
    p2p updates: 4
Labels in use:
  Reserved: 4
  Lowest: 0
  Highest: 13
  Deleted stale label entries: 0

Pkts dropped: 0
Pkts fragmented: 0
Failed lookups: 0
```


show mpls forwarding summary

To display the summary of the MPLS label table, use the **show mpls forwarding summary** command in XR EXEC mode.

```
show mpls forwarding summary [debug] [location node-id] no-counters private
```

Syntax Description	debug	(Optional) Displays the information for internal debugging in the command output.
	location <i>node-id</i>	(Optional) Displays the interfaces on which MPLS is enabled.
	no-counters	(Optional) Skips displaying counters.
	private	(Optional) Displays private information.

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines The optional keywords and arguments described allow display of an MPLS label security information.

Task ID	Task ID	Operations
	mpls-te	read
	mpls-ldp	read
	mpls-static	read

Examples

The following sample output is from the **show mpls forwarding summary** command using the **debug** keyword:

```
RP/0/RP0/CPU0:router# show mpls forwarding summary debug
Forwarding entries:
  Label switching: 0, protected: 0
  MPLS TE tunnel head: 0, protected: 0
  MPLS TE midpoint: 0, protected: 0
  MPLS TE internal: 0, protected: 0
  MPLS P2MP TE tunnel head: 0
  MPLS P2MP TE tunnel midpoint/tail: 0
  MPLS P2MP MLDP tunnel head: 0
  MPLS P2MP MLDP tunnel midpoint/tail: 0
Forwarding updates:
  messages: 2
  p2p updates: 4
Labels in use:
  Reserved: 4
  Lowest: 0
```

show mpls forwarding summary

```

Highest: 13
Deleted stale label entries: 0

Pkts dropped:    0
Pkts fragmented: 0
Failed lookups: 0

```

The following sample output is from the **show mpls forwarding summary** command using the **location** keyword and a specific location:

```

RP/0/RP0/CPU0:router# show mpls forwarding summary location 0/1/CPU0
Forwarding entries:
  Label switching: 0, protected: 0
  MPLS TE tunnel head: 0, protected: 0
  MPLS TE midpoint: 0, protected: 0
  MPLS TE internal: 0, protected: 0
  MPLS P2MP TE tunnel head: 0
  MPLS P2MP TE tunnel midpoint/tail: 0
  MPLS P2MP MLDP tunnel head: 0
  MPLS P2MP MLDP tunnel midpoint/tail: 0
Forwarding updates:
  messages: 2
    p2p updates: 4
Labels in use:
  Reserved: 4
  Lowest: 0
  Highest: 13
  Deleted stale label entries: 0

Pkts dropped:    0
Pkts fragmented: 0
Failed lookups: 0

```

The following sample output is from the **show mpls forwarding summary** command using the **no-counters**:

```

RP/0/RP0/CPU0:router# show mpls forwarding summary no-counters
Forwarding entries:
  Label switching: 0, protected: 0
  MPLS TE tunnel head: 0, protected: 0
  MPLS TE midpoint: 0, protected: 0
  MPLS TE internal: 0, protected: 0
  MPLS P2MP TE tunnel head: 0
  MPLS P2MP TE tunnel midpoint/tail: 0
  MPLS P2MP MLDP tunnel head: 0
  MPLS P2MP MLDP tunnel midpoint/tail: 0
Forwarding updates:
  messages: 2
    p2p updates: 4
Labels in use:
  Reserved: 4
  Lowest: 0
  Highest: 13
  Deleted stale label entries: 0

```

The following sample output is from the **show mpls forwarding summary** command using the **private**:

```

RP/0/RP0/CPU0:router# show mpls forwarding summary private

```

```

Forwarding entries:
  Label switching: 0, protected: 0
  MPLS TE tunnel head: 0, protected: 0
  MPLS TE midpoint: 0, protected: 0
  MPLS TE internal: 0, protected: 0
  MPLS P2MP TE tunnel head: 0
  MPLS P2MP TE tunnel midpoint/tail: 0
  MPLS P2MP MLDP tunnel head: 0
  MPLS P2MP MLDP tunnel midpoint/tail: 0
Forwarding updates:
  messages: 2
  p2p updates: 4
Labels in use:
  Reserved: 4
  Lowest: 0
  Highest: 13
  Deleted stale label entries: 0
Path count:
  Unicast: 0

Pkts dropped: 0
Pkts fragmented: 0
Failed lookups: 0
fwd-flags: 0x5, ttl-expire-pop-cnt: 0

```

This table describes the significant fields shown in the display.

Table 3: show mpls forwarding summary Field Descriptions

Field	Description
Label switching	Number of Label switching Label Forwarding Information Base (LFIB) forwarding entries.
MPLS TE tunnel head	Number of forwarding entries (installed at ingress LSR) on MPLS TE tunnel head.
Forwarding updates	Number of forwarding updates sent from LSD (RP/DRP) to LFIB/MPLS (RP/DRP/LC) using BCDL mechanism, indicating the total number of updates and total number of BCDL messages.
Labels in use	Local labels in use (installed in LFIB). These usually indicate the lowest and highest label in use (allocated by applications). Furthermore, some reserved labels, such as explicit-nullv4, explicit-nullv6, are installed in the forwarding plane. The label range is 0 to 15.

show mpls interfaces

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

show mpls interfaces [*type interface-path-id*] [**location** *node-id*] [**detail**]

Syntax Description	
<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or a virtual interface.
	Note Use the show interfaces command to see a list of all possible interfaces currently configured on the router.
	For more information about the syntax for the router, use the question mark (?) online help function.
location <i>node-id</i>	(Optional) Displays hardware resource counters on the designated node.
detail	(Optional) Displays detailed information for the designated node.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines This command displays MPLS information about a specific interface or about all interfaces where MPLS is configured.

Task ID	Task ID	Operations
	mpls-te	read, write
	mpls-ldp	read, write
	mpls-static	read, write

Examples

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

```
RP/0/RP0/CPU0:router# show mpls interfaces
Interface                               LDP      Tunnel   Static   Enabled
```

```

-----
HundredGigE0/2/0/0      No      No      No      Yes      No      No      No      Yes
HundredGigE0/2/0/10    No      No      No      Yes      No      No      No      Yes
TenGigE0/2/0/2/2       No      No      No      Yes      No      No      No      Yes
TenGigE0/2/0/2/0       Yes     No      No      Yes      No      No      No      Yes
TenGigE0/4/0/16/0      No      No      No      Yes      No      No      No      Yes
TenGigE0/4/0/12/2      No      No      No      Yes      No      No      No      Yes
TenGigE0/4/0/12/0      Yes     No      Yes     Yes      No      No      No      Yes
TenGigE0/4/0/0/2       No      No      No      Yes      No      No      No      Yes
HundredGigE0/7/0/29    No      No      No      Yes      Yes     No      Yes     Yes
Bundle-Ether1          Yes     No      No      Yes      No      No      No      Yes
Bundle-Ether3          No      No      No      Yes      No      No      No      Yes
Bundle-Ether5          No      No      No      Yes      Yes     No      No      Yes
Bundle-Ether7          No      No      No      Yes      Yes     No      No      Yes
-----

```

This table describes the significant fields in the sample display.

Table 4: show mpls interfaces Command Field Descriptions

Field	Description
LDP	State of LDP labelling.
Tunnel	State of LSP Tunnel labelling.
MTU	MTU ⁵ of labeled packet.
Caps	Capsulation switching chains installed on an interface.
M	MPLS switching capsulation/switching chains are installed on the interface and are ready to switch MPLS traffic.

⁵ MTU = Maximum Transmission Unit.

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 XR EXEC mode.

show mpls label range

Syntax Description This command has no arguments or keywords.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines You can use the **show mpls label range** command to configure a range for local labels that is different from the default range.

Task ID	Task ID	Operations
	mpls-te	read, write
	mpls-ldp	read, write
	mpls-static	read, write

Examples

The following shows a sample output from the **show mpls label range** command:

```
RP/0/RP0/CPU0:router# show mpls label range
Range for dynamic labels: Min/Max: 16000/144000
```

This table describes the significant fields shown in the display.

Table 5: show mpls label range Command Field Descriptions

Field	Description
Range for dynamic labels	Minimum and maximum allowable range for local labels (which differs from the default range).

show mpls label table

To display the local labels contained in the MPLS label table, use the **show mpls label table** command in XR EXEC mode.

show mpls label table *table-index* [**application** *application*] [**label** *label-value*] [**summary**] [**detail**]

Syntax Description		
<i>table-index</i>		Index of the label table to display. The global label table is 0. Currently, you can specify table 0 only.
application <i>application</i>	(Optional)	Displays all labels owned by the selected application. Options are: bgp-ipv4 , bgp-spr , bgp-vpn-ipv4 , internal , ldp , none , l2vpn , static , te-control , te-link , and test .
label <i>label-value</i>	(Optional)	Displays a selected label based on the label value. Range is 0 to 1048575.
summary	(Optional)	Displays a summary of local labels.
detail	(Optional)	Displays detailed information for the MPLS label table.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines Labels 16 to 15999 are reserved for static Layer 2 VPN pseudowires.

Task ID	Task ID	Operations
	mpls-te	read, write
	mpls-ldp	read, write
	mpls-static	read, write

Examples

The following shows a sample output from the **show mpls label table** command:

```
RP/0/RP0/CPU0:router# show mpls label table 0
```

```
Table Label Owner State Rewrite
```

```

-----
0    0    LSD      InUse  Yes
0    1    LSD      InUse  Yes
0    2    LSD      InUse  Yes
0    3    LSD      InUse  Yes
0    16   TE-Link   InUse  Yes

```

This table describes the significant fields shown in the display.

Table 6: show mpls label table Command Field Descriptions

Field	Description
Table	Table ID.
Label	Label index.
Owner	Application that allocated the label. All labels displaying “InUse” state have an owner.
State	<p>InUse Label allocated and in use by an application.</p> <p>Alloc Label allocated but is not yet in use by an application.</p> <p>Pend Label was in use by an application that has terminated unexpectedly, and the application has not reclaimed the label.</p> <p>Pend-S Label was in use by an application, but the MPLS LSD (Label Switching Database) server has recently restarted and the application has not reclaimed the label.</p>
Rewrite	Number of initiated rewrites.

show mpls lsd applications

To display the MPLS applications registered with the MPLS Label Switching Database (LSD) server, use the **show mpls lsd applications** command in XR EXEC mode.

show mpls lsd applications [**application** *application*]

Syntax Description	application <i>application</i> (Optional) Displays all labels owned by the selected application. Options are: bgp-ipv4 , bgp-sprk , internal , ldp , none , static , te-control , te-link , and test .
---------------------------	--

Command Default	No default behavior or values
------------------------	-------------------------------

Command Modes	XR EXEC mode
----------------------	--------------

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines	MPLS applications include Traffic Engineering (TE) control, TE Link Management and label distribution protocol (LDP). The application must be registered with MPLS LSD for its features to operate correctly. All applications are clients (see the show mpls lsd clients, on page 35 command), but not all clients are applications.
-------------------------	---

Task ID	Task ID	Operations
	mpls-te	read, write
	mpls-ldp	read, write
	mpls-static	read, write

Examples

The following shows a sample output from the **show mpls lsd applications** command:

```
RP/0/RP0/CPU0:router# show mpls lsd applications
```

Type	State	RecoveryTime	Node
LDP	Active	300	0/0/CPU0
TE-Control	Active	100	0/0/CPU0
TE-Link	Active	600	0/0/CPU0

This table describes the significant fields shown in the display.

Table 7: show mpls lsd applications Command Field Descriptions

Field	Description
Type	LSD application type.
State	<p>Active Application registered with MPLS LSD and is functioning correctly.</p> <p>Recover Application registered with MPLS LSD and is recovering after recently restarting. In this state, the RecoveryTime value indicates how many seconds are left before the application becomes active.</p> <p>Zombie Application not re-registered after an unexpected termination. In this case, RecoveryTime indicates how many seconds are left before MPLS LSD gives up on the application.</p>
RecoveryTime	Seconds remaining before MPLS LSD gives up or resumes the application.
Node	Node expressed in standard <i>rack/slot/module</i> notation.

show mpls lsd clients

To display the MPLS clients connected to the MPLS Label Switching Database (LSD) server, use the **show mpls lsd clients** command in XR EXEC mode.

show mpls lsd clients

Syntax Description This command has no arguments or keywords.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines MPLS clients include Traffic Engineering (TE) Control, TE Link Management, Label Distribution Protocol (LDP), and Bulk Content Downloader (BCDL) Agent. Not all clients are applications (see the **show mpls lsd applications** command), but all applications are clients.

Task ID	Task ID	Operations
	mpls-te	read, write
	mpls-ldp	read, write
	mpls-static	read, write

Examples

The following shows a sample output from the **show mpls lsd clients** command:

```
RP/0/RP0/CPU0:router# show mpls lsd clients

  Id Services                Node
  -----
  0  BA (p=none)              0/0/CPU0
  1  A (TE-Link)              0/0/CPU0
  2  A (LDP)                  0/0/CPU0
  3  A (TE-Control)           0/0/CPU0
```

The following table describes the significant fields shown in the display.

Table 8: show mpls lsd clients Command Field Descriptions

Field	Description
Id	Client identification number.
Services	A(xxx) means that this client is an application and xxx is the application name, BA(yyy) means that this client is a BCDL Agent and yyy is expert data. Depending on system conditions, there can be multiple BCDL Agent clients (this is normal).
Node	Node expressed in standard rack/slot/module notation.

show mpls lsd forwarding labels

To display the LSD label RPF information, use the **show mpls lsd forwarding labels** command in XR EXEC mode.

show mpls lsd forwarding [**labels** *low-value high-value*] [**location** *node-id*]

Syntax Description		
labels <i>low-value high-value</i>		(Optional) Entries with a local labels range. Ranges for both <i>low-value</i> and <i>high-value</i> are 0 to 1048575.
location <i>node-id</i>		Displays hardware resource counters on the designated node.

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines The optional keywords and arguments described allow display of an MPLS label security information.

Task ID	Task ID	Operations
	mpls-te	read
	mpls-ldp	read
	mpls-static	read

Examples

The following sample output is from the **show mpls lsd forwarding labels** command using a specific location:

```
RP/0/RP0/CPU0:router# show mpls lsd forwarding labels 1 13 detail location 0/1/CPU0
```

show mpls lsd forwarding summary

To display the LSD label RPF information, use the **show mpls lsd forwarding summary** command in XR EXEC mode.

show mpls lsd forwarding summary [**location** *node-id*]

Syntax Description	location <i>node-id</i>	Displays hardware resource counters on the designated node.
---------------------------	--------------------------------	---

Command Modes	XR EXEC mode
----------------------	--------------

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines	The optional keywords and arguments described allow display of the interface label security information.
-------------------------	--

Task ID	Task ID	Operations
	mpls-te	read
	mpls-ldp	read
	mpls-static	read

Examples

The following sample output is from the **show mpls lsd forwarding summary** command and a specific location:

```
RP/0/RP0/CPU0:router# show mpls lsd forwarding summary location 0/1/CPU0
Interface      IFH          MTU  Flags          Type
-----
FI0/1/CPU0    0x02000080   8000 0x01000000    0x0000001b
tt1           0x08000320   1500 0x01000000    0x00000024
```

show mpls traffic-eng fast-reroute database

To display the contents of the fast reroute (FRR) database, use the **show mpls traffic-eng fast-reroute database** command in XR EXEC mode.

```
show mpls traffic-eng fast-reroute database [ip-address] [ip-address /length] [afi-all { safi-all |
unicast} {ip-address ip-address/length}] [backup-interface] [tunnel tunnel-id] [unresolved] [interface
type interface-path-id] [ipv4 { safi-all | unicast} {ip-address ip-address/length}] [labels low-number
high-number] [state {active | complete | partial | ready}] [role {head | midpoint}] [summary]
[location node-id]
```

Syntax Description

<i>ip-address</i>	(Optional) IP address of the destination network.
<i>ip-address /length</i>	(Optional) Bit combination indicating the portion of the IP address that is being used for the subnet address.
afi-all	(Optional) Returns data for all specified address family identifiers.
safi-all	(Optional) Returns data for all sub-address family identifiers.
unicast	(Optional) Returns unicast data only.
backup-interface	(Optional) Displays entries with the specified backup interface.
tunnel <i>tunnel-id</i>	(Optional) Tunnel and tunnel ID to which packets with this label are going. The summary suboption is available.
unresolved	(Optional) Displays entries whose backup interface has not yet been fully resolved.
interface	(Optional) Displays entries with this primary outgoing interface. The summary keyword is available.
<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or a virtual interface. Note Use the show interfaces command to see a list of all possible interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
ipv4	(Optional) Displays only IPv4 data.
labels	(Optional) Displays database entries that possess in-labels assigned by this router (local labels). Specify either a starting value or a range of values. The state suboption is available.

state	(Optional) Filters the database according to the state of the entry:
active	FRR rewrite is in the forwarding active database (where it can be placed onto appropriate incoming packets).
complete	FRR rewrite is assembled, ready or active.
partial	FRR rewrite is fully created; its backup routing information is still incomplete.
ready	FRR rewrite was created but is not in the forwarding active state.
role	(Optional) Displays entries associated either with the tunnel head or tunnel midpoint . The summary suboption is available.
summary	(Optional) Displays summarized information about the FRR database.
location <i>node-id</i>	(Optional) Displays hardware resource counters on the designated node.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

Task ID	Task ID	Operations
	mpls-te	read

Examples

The following shows a sample output from the **show mpls traffic-eng fast-reroute database** command:

```
RP/0/RP0/CPU0:router# show mpls traffic-eng fast-reroute database

Status      Count
-----
Active      0
Ready       10000
Partial     0
IGP         0
```



Note The Prefix field indicates the IP address where packets with this label are headed.

The following sample output displays filtering of the FRR database using the **backup-interface** keyword:

```
RP/0/RP0/CPU0:router# show mpls traffic-eng fast database backup-interface
```

```
LSP midpoint FRR information:
```

LSP Identifier	Out Intf/ Label	FRR Intf/ Label	Status
10.10.10.10 1006 [54]	Gi0/6/5/2:Pop	tt1060:Pop	Ready

The following sample output displays the FRR database filtered by the primary outgoing interface:

```
RP/0/RP0/CPU0:router# show mpls traffic-eng fast-reroute database interface bundle-ether 12
```

```
LSP midpoint FRR information:
```

LSP Identifier	Local Label	Out Intf/ Label	FRR Intf/ Label	Status
11.255.255.1 128 [145]	24001	BE12:Pop	tt65001:Pop	Ready
11.255.255.1 3174 [112]	24002	BE12:Pop	tt65001:Pop	Ready
11.255.255.1 1443 [121]	24003	BE12:Pop	tt65001:Pop	Ready
11.255.255.1 3009 [121]	24005	BE12:Pop	tt65001:Pop	Ready
11.255.255.1 10 [157]	24006	BE12:Pop	tt65001:Pop	Ready
11.255.255.1 63 [147]	24007	BE12:Pop	tt65001:Pop	Ready
11.255.255.1 4848 [120]	24010	BE12:Pop	tt65001:Pop	Ready
11.255.255.1 292 [144]	24011	BE12:Pop	tt65001:Pop	Ready
11.255.255.1 1455 [131]	24012	BE12:Pop	tt65001:Pop	Ready
11.255.255.1 2932 [116]	24013	BE12:Pop	tt65001:Pop	Ready
11.255.255.1 2967 [146]	24014	BE12:Pop	tt65001:Pop	Ready
11.255.255.1 6 [167]	24016	BE12:Pop	tt65001:Pop	Ready
11.255.255.1 98 [159]	24017	BE12:Pop	tt65001:Pop	Ready
11.255.255.1 2985 [131]	24018	BE12:Pop	tt65001:Pop	Ready
11.255.255.1 334 [132]	24019	BE12:Pop	tt65001:Pop	Ready
11.255.255.1 160 [140]	24020	BE12:Pop	tt65001:Pop	Ready
11.255.255.1 4935 [123]	24021	BE12:Pop	tt65001:Pop	Ready

The following sample output displays a summary of the FRR database with the role as head:

```
RP/0/RP0/CPU0:router# show mpls traffic-eng fast-reroute database role head summary
```

Status	Count
Active	0
Ready	3
Partial	0

The following sample output displays summarized information for the FRR database with the role as midpoint:

```
RP/0/RP0/CPU0:router# show mpls traffic-eng fast-reroute database role midpoint summary
```

Status	Count
Active	0
Ready	2

```
Partial 0
```

This table describes the significant fields shown in the display.

Table 9: show mpls traffic-eng fast-reroute database Command Field Descriptions

Field	Description
Tunnel	Short form of tunnel interface name.
Out intf/label	<p>Out interface</p> <p>Short name of the physical interface through which traffic goes to the protected link.</p> <p>Out label</p> <p>At a tunnel head, this is the label that the tunnel destination device advertises. The value “Unlabeled” indicates that no such label is advertised.</p> <p>At a tunnel midpoint, this is the label selected by the next hop device. The value “Pop Label” indicates that the next hop is the final hop for the tunnel.</p>
FRR intf/label	<p>Fast reroute interface</p> <p>Backup tunnel interface.</p> <p>Fast reroute label</p> <p>At a tunnel head, this is the label that the tunnel tail selected to indicate the destination network. The value “Unlabeled” indicates that no label is advertised.</p> <p>At a tunnel midpoint, this has the same value as the Out label.</p>
Status	State of the rewrite: partial, ready, or active.

show mpls traffic-eng fast-reroute log

To display a history of fast reroute (FRR) events, use the **show mpls traffic-eng fast-reroute log** command in XR EXEC mode.

show mpls traffic-eng fast-reroute log [*interface**type**interface-path-id* | **location** *node-id*]

Syntax Description	interface	(Optional) Displays all FRR events for the selected protected interface.
	<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
	<i>interface-path-id</i>	Physical interface or virtual interface.
	Note	Use the show interfaces command to see a list of all possible interfaces currently configured on the router.
		For more information about the syntax for the router, use the question mark (?) online help function.
	location <i>node-id</i>	(Optional) Displays all FRR events that occurred on the selected node.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID	Task ID	Operations
	mpls-te	read

Examples The following shows a sample output from the **show mpls traffic-eng fast-reroute log** command:

```
RP/0/RP0/CPU0:router# show mpls traffic-eng fast-reroute log
```

Location Protected Interface	When	Switching Time (usec)
0/RP0/CPU0 BE12	Jan 31 15:42:12.723782	0
0/RP0/CPU0 BE12	Jan 31 16:27:32.419837	0
0/RP0/CPU0 BE12	Jan 31 18:31:55.019120	0

This table describes the significant fields shown in the display.

Table 10: show mpls traffic-eng fast-reroute log Field Descriptions

Field	Description
Node	Node address.
Protected Interface	Type and interface-path-id that is being protected.
LSPs	LSP ⁶ associated with each interface being protected.
Rewrites	Number of rewrites initiated on the LSP.
When	Date the interface was protected.
Switching Time	Time required to switch the protected interface in microseconds.

⁶ LSP = Link-state Packet.