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MPLS Forwarding Commands

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 8000 Series Routers*.

hw-module profile cef cbf forward-class-list

To optimize hardware resource usage for forward-class, use the **hw-module profile cef cbf forward-class-list** command in global configuration mode. To return to the default configuration, use the **no** form of this command.

hw-module profile cef cbf forward-class-list *id*

Syntax Description

id	Specifies the forward-class ID.

Command Default

This command is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.5.3	This command was introduced.

Usage Guidelines

You must reload the router for the configuration to take effect.

Use this command to optimize the hardware resource usage. Each forward-class mentioned in forward-class list is expected to have specific egress TE tunnels associated with it.

This example shows how to enable forward-class for policy based tunnel selection:

```
Router(config)# hw-module profile cef cbf forward-class-list 0 1 2 3 5
Router# reload
```

hw-module profile cef stats label app-default dynamic

To increase MPLS per path statistics collection to more than 4K counters, use the **hw-module profile cef stats label app-default dynamic** command in global configuration mode. To return to the default configuration, use the **no** form of this command.

hw-module profile cef stats label app-default dynamic

This command has no keywords or arguments.

Command Default

This command is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.14	This command was introduced. The per-path statistics collection is not supported for SR-TE, MPLS-TE, L3VPN, 6PE, and BGP-LU technologies.

Usage Guidelines

The MPLS per-path statistics are reported for IPv4 IGP (LDP/SR) paths. For each outgoing labeled path, a counter is allocated. By default, 4K counters are supported. You can increase it up to 96K counters (thereby extending statistics collection to as many IPv4 IGP (LDP/SR) paths), by enabling this command. You can view the statistics in the **show mpls forwarding labels** command output.

After you execute the **hw-module profile cef stats label app-default dynamic** command, or use its **no** form, you must execute the **reload** command. It loads the device image afresh, and restarts the device. Else, the command will not come into effect.

This example shows how to increase MPLS per path statistics collection to more than 4K IPv4 IGP (LDP/SR) counters:

```
Router(config)# hw-module profile cef stats label app-default dynamic
..
Router# reload
```

mpls label range

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

mpls label range table *table-id minimum maximum*

Syntax Description

table *table-id*	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.
minimum	Smallest allowed label in the label space. Default is 16000.
maximum	Largest allowed label in the label space. Default is 1048575.

Command Default

table-id: 0

minimum: 16000

maximum: 1048575

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.12	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 draft-ietf-mpls-label-encaps-07.txt for details) and cannot be included in the range using the **mpls label range** command.

Labels 16 through 15999 are reserved for Layer 2 VPN static pseudowires. You should not configure Layer 2 VPN static pseudowires which fall within the dynamic range. If more Layer 2 VPN static pseudowires are required, restrict the dynamic label range using this configuration.

Note

- Labels outside the current range and which are allocated by MPLS applications remain in circulation until released.
- You must understand the maximum labels that are supported for each platform versus the labels that are supported for the CLI.

Note Restart the router after changing the mpls label range.

Task ID

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

Related Commands

Command	Description
show mpls label range, on page 33	Displays the range of the MPLS local label space.

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 7.0.12	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
```

Related Commands

Command	Description
show mpls forwarding labels, on page 23	Display MPLS label RPF information.
show mpls forwarding summary, on page 26	Displays the contents of the MPLS label security information.
show mpls forwarding label-security interface, on page 20	Display MPLS label interface security information.
show mpls forwarding label-security summary location, on page 22	Displays MPLS label security information summary.

Command	Description
show mpls ea interfaces, on page 11	Displays the interface label security information.
show mpls lsd forwarding labels, on page 40	Displays the LSD label RPF information.

mpls mtu

To configure the maximum transmission unit (MTU) on an MPLS interface, use the **mpls mtu** command in XR Interface Configuration sub-mode.

mpls mtu *mtu-size*

Syntax Description

mtu-size	MTU size, in bytes. The range is from 68 to 65535.

Command Default

The default MPLS MTU value is the interface MTU subtracted by the layer 2 header size of the main interface.

Command Modes

Interface Configuration sub-mode

Command History

Release	Modification
Release 7.10.1	This command was introduced.

Usage Guidelines

Only routers and line cards with the Q200, Q201 or Q202 ASIC support the MPLS MTU feature. For more information on the routers and line cards with the Q200, Q201 or Q202 ASIC, refer *Cisco 8000 Series Routers Data Sheet*.

If you do not configure the MPLS MTU for an MPLS enabled interface, the router applies a default MPLS MTU that equals the interface MTU subtracted by the layer 2 header size of the main interface.

If you configure MPLS MTU to a value greater than the interface MTU, the router restricts the MPLS MTU to the value that equals the interface MTU subtracted by the layer 2 header size of the main interface.

You cannot configure MPLS MTU on Bridged Virtual Interfaces (BVI). The router applies an MPLS MTU of the interface MTU subtracted by the layer 2 header size on BVI interfaces.

Task ID

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

Examples

The following example shows you how to configure an MPLS MTU of 1400 bytes:

```
Router# config terminal
Router(config)# interface FourHundredGigE 0/0/0/0
Router(config-if)# mpls mtu 1400
Router(config-if)# commit
```

Related Commands

Command	Description
mtu	Configure MTU value for packets transmitted by the interface.

show mpls ea interfaces

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

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

Syntax Description

location *node-id*	Displays hardware resource counters on the designated node.

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.12	This command was introduced.

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 ea interfaces location 0/1/CPU0
Interface      IFH         MTU  Flags      Type
-------------- ---------- ----- ---------- ----------
FI0/1/CPU0     0x02000080  8000 0x01000000 0x0000001b
tt1            0x08000320  1500 0x01000000 0x00000024
```

Related Commands

Command	Description
show mpls lsd forwarding labels, on page 40	Displays the LSD label RPF information.
show mpls forwarding summary, on page 26	Displays the contents of the MPLS label security information.

show mpls forwarding tunnels

To display the contents of the **MPLS** forwarding tunnel, use the **show mpls forwarding tunnel** command in 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

EXEC

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

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

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
```

```
RP/0/RSP0/CPU0:PE1#sh mpls forwarding tunnels 1999 detail
Thu Jul 23 22:56:09.726 PDT
Tunnel        Outgoing    Outgoing     Next Hop        Bytes
Name          Label       Interface                    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        Outgoing    Outgoing     Next Hop        Bytes
Name          Label       Interface                    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        Outgoing    Outgoing     Next Hop        Bytes
Name          Label       Interface                    Switched
------------- ----------- ------------ --------------- ------------
tt1999        50045       BE10         point2point     0
```

Related Commands

Command	Description
show mpls forwarding exact-route, on page 14	Displays the exact path for the source and destination address pair.

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* | **ipv6***source-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 *label-number*	Displays the Label Number. Range is 0 to 1048575.
bottom-label *value*	Displays the bottom label value. Range is 0 to 1048575.
ipv4 *source-address destination-address*	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 *source-address destination-address*	Displays the exact path for IPv6 payload. The IPv6 source address in x:x::x format. The IPv6 destination address in x:x::x format.
detail	(Optional) Displays detailed information.
protocol *protocol*	(Optional) Displays the specified protocol for the route.
source-port *source-port*	Sets the UDP source port. The range is from 0 to 65535.
destination-port *destination-port*	Sets the UDP destination port. The range is from 0 to 65535.
ingress-interface	Sets the ingress interface.
type	Interface type. For more information, use the question mark (?) online help function.
interface-path-id	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 *node-id*	(Optional) Displays hardware resource counters on the designated node.
policy-class *value*	(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 7.0.12	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

Task ID

Task ID	Operations
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 24001
entropy-label 1234 ingress-interface tenGigE 0/0/0/1/0 location 0/0/CPU0

Local  Outgoing    Prefix             Outgoing     Next Hop        Bytes
Label  Label       or ID              Interface                    Switched
------ ----------- ------------------ ------------ --------------- ------------
24001  64002       194.0.0.1/32       Te0/0/0/1/0.1 25.2.11.1       N/A
     Via: Te0/0/0/1/0.1, Next Hop: 25.2.11.1
     Label Stack (Top -> Bottom): { 64002 }
     NHID: 0x4, Encap-ID: N/A, Path idx: 2, Backup path idx: 0, Weight: 0
     Hash idx: 2
     MAC/Encaps: 18/22, MTU: 1500
     Outgoing Interface: TenGigE0/0/0/1/0.1 (ifhandle 0x00000500)
```

This table describes the significant fields shown in the display.

Table 1: 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[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 fullname

To print the full name of the outgoing interface, use the **show mpls forwarding fullname** command in XR EXEC mode. A maximum of 80 characters of the outgoing interface name can be printed.

show mpls forwarding fullname [**debug**] [**location** *node-id*] **no-counters** **private** **rpf**

Syntax Description

debug	(Optional) Displays the information for internal debugging in the command output.
location*node-id*	(Optional) Displays hardware resource counters on the specified node.
no-counters	(Optional) Skips displaying counters.
private	(Optional) Displays private information.
rpf	(Optional) Displays label RPF information.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 25.1.1	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 is an example **show mpls forwarding tunnels** command with the **fullname** keyword:

```
RP/0/0/CPU0:router# show mpls forwarding tunnels fullname
Fri Oct  4 15:48:05.161 EDT
Tunnel                    Outgoing    Outgoing
                             Next Hop        Bytes
Name                      Label       Interface
                                         Switched
------------------------- -----------
-------------------------------------------------------------------------------
--------------- ------------
SJ-TO-OTT                 24000       GigabitEthernet0/2/0/6
                             16.16.16.4      0
OTT-TO-IND                24002       GigabitEthernet0/2/0/0
                             10.10.10.2      0
FROM-USDEN5-BB-CR2-TO-USCH 24001       GigabitEthernet0/2/0/6
```

```
                              16.16.16.4      0
FROM-USDEN5-BB-CR2-TO-USCH Pop          GigabitEthernet0/2/0/6
                              16.16.16.4      0

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

This example shows the output for the **show mpls forwarding exact-route** command with the **fullname** keyword:

```
RP/0/0/CPU0:router#sh mpls forwarding exact-route label 24004 bottom-label 1 fullname
Fri Oct  4 15:48:48.644 EDT
Local Label  Outgoing Label   Prefix or ID       Outgoing Interface
               Next Hop           Bytes Switched
-----------  --------------  ---------------  ------------------------------------
              -----------        -----------------
24004          Pop             No ID
FROM-USDEN5-BB-CR2-TO-USCHI5-BB-CR2-CBF0-1-Scale2729     point2point           N/A

     Via: FROM-USDEN5-, Next Hop: point2point
Label Stack (Top -> Bottom): { Imp-Null }
     NHID: 0x0, Encap-ID: N/A, Path idx: 0, Backup path idx: 0, Weight: 0
     Hash idx: 0
     MAC/Encaps: 0/0, MTU: 1500
     Outgoing Interface: FROM-USDEN5-BB-CR2-TO-USCHI5-BB-CR2-CBF0-1-Scale2729 (ifhandle
0x00000110)
```

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 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.
type	Interface type. For more information, use the question mark (?) online help function.
interface-path-id	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*node-id*	(Optional) Displays hardware resource counters on the designated node.

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.12	This command was introduced.

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 GigabitEthernet location
 0/1/CPU0
```

Related Commands

Command	Description
show mpls forwarding summary, on page 26	Displays the contents of the MPLS label security information.
show mpls lsd forwarding labels, on page 40	Displays the LSD label RPF information.
show mpls forwarding label-security summary location, on page 22	Displays MPLS label security information summary.

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 EXEC mode.

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

Syntax Description

location*node-id*	Displays label security information on the designated node.

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.12	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
```

Related Commands

Command	Description
show mpls forwarding summary, on page 26	Displays the contents of the MPLS label security information.
show mpls lsd forwarding labels, on page 40	Displays the LSD label RPF information.
show mpls forwarding label-security summary location, on page 22	Displays MPLS label security information summary.

show mpls forwarding labels

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

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

Syntax Description

labels *low-value high-value*	(Optional) Entries with a local labels range. Ranges for both *low-value* and *high-value* are 0 to 1048575.
detail	
rpf	(Optional) Displays label RPF information.

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.12	This command was introduced.
Release 7.0.14	The **hw-module profile cef stats label app-default dynamic** command was introduced in the global configuration mode to increase MPLS per path statistics collection to more than 4K IPv4 IGP (LDP/SR) counters. If you enable it, the **show mpls forwarding labels** command output will display MPLS per path statistics for more than 4k counters.

Usage Guidelines

The optional keywords and arguments described allow display of MPLS label security and RPF information.

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
```

Examples

The following sample output shows per-path statistics information:

```
Router# show mpls forwarding labels 24016 detail

Local   Outgoing Prefix    Outgoing Next Hop         Bytes Switched
Label   Label              or ID Interface
------------------------------------------------------------------
24016  24013  200.0.0.0/24 Hu0/0/0/26 10.1.2.2       32708

  Updated: Mar 10 08:01:45.092
  Version: 62, Priority: 3
  Label Stack (Top -> Bottom): { 24013 }
  NHID: 0x0, Encap-ID: N/A, Path idx: 0, Backup path idx: 0, Weight: 0
  MAC/Encaps: 14/18, MTU: 1500
  Outgoing Interface: HundredGigE0/0/0/26 (ifhandle 0x0f000248)
  Packets Switched: 481

       24013 200.0.0.0/24 Hu0/0/0/25 10.1.1.2         32640

  Updated: Mar 10 08:01:45.092
  Version: 62, Priority: 3
  Label Stack (Top -> Bottom): { 24013 }
  NHID: 0x0, Encap-ID: N/A, Path idx: 1, Backup path idx: 0, Weight: 0
  MAC/Encaps: 14/18, MTU: 1500
  Outgoing Interface: HundredGigE0/0/0/25 (ifhandle 0x0f000250)
  Packets Switched: 480

Total Packets/Bytes Switched: 961/65348
```

Examples

The following sample output shows per-path statistics information:

```
Router# show mpls forwarding

Local   Outgoing Prefix           Outgoing Next Hop            Bytes Switched
Label   Label                      or ID Interface
------------------------------------------------------------------------------
24016  24013     200.0.0.0/24     Hu0/0/0/26  10.1.2.2   32708
       24013     200.0.0.0/24     Hu0/0/0/25  10.1.1.2   32640
24017  24014     201.0.0.0/24     Hu0/0/0/26  10.1.2.2   32640
       24014     201.0.0.0/24     Hu0/0/0/25  10.1.1.2   32640
24018  24015     202.0.0.0/24     Hu0/0/0/26  10.1.1.2   32640
       24015     202.0.0.0/24     Hu0/0/0/25  10.1.1.2   32640
24019  24016     203.0.0.0/24     Hu0/0/0/26  10.1.2.2   0
       24016     203.0.0.0/24     Hu0/0/0/25  10.1.1.2   65280
24020  24017     204.0.0.0/24     Hu0/0/0/26  10.1.2.2   32640
       24017     204.0.0.0/24     Hu0/0/0/25  10.1.1.2   32640
```

Related Commands

Command	Description
show mpls forwarding summary, on page 26	Displays the contents of the MPLS label security information.
show mpls lsd forwarding labels, on page 40	Displays the LSD label RPF information.

Command	Description
show mpls forwarding label-security summary location, on page 22	Displays MPLS label security information summary.

show mpls forwarding summary

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

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

Syntax Description

debug	(Optional) Displays the information for internal debugging in the command output.
location*node-id*	(Optional) Displays hardware resource counters on the designated node.
no-counters	(Optional) Skips displaying counters.
private	(Optional) Displays private information.
rpf	(Optional) Displays label RPF information.

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.12	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
   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
```

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

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

This table describes the significant fields shown in the display.

Table 2: show mpls forwarding summary Field Descriptions

Field	Description
Label switching	Number of Label switching Label Forwarding Information Base (LFIB) forwarding entries.

Field	Description
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.

Related Commands

Command	Description
show mpls lsd forwarding labels, on page 40	Displays the LSD label RPF information.
show mpls forwarding label-security interface, on page 20	Display MPLS label interface security information.
show mpls forwarding label-security summary location, on page 22	Displays MPLS label security information summary.
show mpls ea interfaces, on page 11	Displays the interface label security information.
show mpls lsd forwarding labels, on page 40	Displays the LSD label RPF information.

show mpls interfaces

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

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

Syntax Description

type	(Optional) Interface type. For more information, use the question mark (?) online help function.
interface-path-id	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 *node-id*	(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

EXEC

Command History

Release	Modification
Release 7.0.12	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
-------------------------- -------- -------- -------- --------
TenGigE0/3/2/1             No       Yes      No       Yes
TenGigE0/3/1/1             Yes      Yes      No       Yes
TenGigE0/2/0/3             Yes      No       No       Yes
GigabitEthernet0/1/3/1     Yes      No       No       Yes
Bundle-Ether18             Yes      Yes      No       Yes
Bundle-Ether150            Yes      Yes      No       Yes
Bundle-Ether5              Yes      Yes      No       Yes
Bundle-Ether2              Yes      Yes      No       Yes
HundredGigE0/6/3/1         Yes      Yes      No       Yes
TenGigE0/5/4/2             Yes      Yes      No       Yes
HundredGigE0/6/5/0         Yes      Yes      No       Yes
HundredGigE0/6/3/1         Yes      Yes      No       Yes
```

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

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

  Interface                  LDP      Tunnel   Enabled
  -------------------------- -------- -------- --------
  POS0/4/0/0                 Yes       Yes      Yes
  POS0/4/0/1                 Yes       Yes      Yes
  POS0/4/0/2                 Yes       Yes      Yes
```

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

```
RP/0/RP0/CPU0:router# show mpls interfaces detail

  Interface POS0/4/0/0:
          LDP labelling enabled
          LSP labelling enabled (TE-Control)
          MPLS enabled
          MTU = 4474
  Interface POS0/4/0/1:
          LDP labelling enabled
          LSP labelling enabled (TE-Control)
          MPLS enabled
          MTU = 4474
  Interface POS0/4/0/2:
          LDP labelling enabled
          LSP labelling enabled (TE-Control)
          MPLS enabled
          MTU = 4474
```

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

```
RP/0/RP0/CPU0:router# show mpls interfaces location pos 0/4/0/0

  Interface                  LDP      Tunnel   Enabled
  -------------------------- -------- -------- --------
  POS0/4/0/0                 Yes      Yes      Yes

RP/0/RP0/CPU0:router# show mpls interfaces pos 0/4/0/0 detail


  Interface POS0/4/0/0:
```

```
LDP labelling enabled
LSP labelling enabled (TE-Control)
MPLS enabled
MTU = 4474
```

This table describes the significant fields in the sample display.

Table 3: show mpls interfaces Command Field Descriptions

Field	Description
LDP	State of LDP labelling.
Tunnel	State of LSP Tunnel labelling.
MTU	MTU[3] 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.

[3] 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 EXEC mode.

show mpls label range

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.12	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 4: 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 EXEC mode.

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

Syntax Description

table-index	Index of the label table to display. The global label table is 0. Currently, you can specify table 0 only.
application *application*	(Optional) Displays all labels owned by the selected application. Options are: **bgp-ipv4**, **bgp-spkr**, **bgp-vpn-ipv4**, **internal**, **ldp**, **none**, **l2vpn**, **static**, **te-control**, **te-link**, and **test**.
label *label-value*	(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

EXEC

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

Note 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 5: 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	**InUse** Label allocated and in use by an application. **Alloc** Label allocated but is not yet in use by an application. **Pend** Label was in use by an application that has terminated unexpectedly, and the application has not reclaimed the label. **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.
Rewrite	Number of initiated rewrites.

Related Commands

Command	Description
show mpls forwarding labels, on page 23	Displays entries in the MPLS forwarding table. Label switching entries are indexed by their local label.
show mpls lsd applications, on page 36	Displays MPLS applications that are registered with the MPLS LSD server.

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 EXEC mode.

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

Syntax Description

application *application*	(Optional) Displays all labels owned by the selected application. Options are: **bgp-ipv4**, **bgp-spkr**, **bgp-vpn-ipv4**, **internal**, **ldp**, **none**, **l2vpn**, **static**, **te-control**, **te-link**, and **test**.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.12	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 38 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 6: show mpls lsd applications Command Field Descriptions

Field	Description
Type	LSD application type.
State	**Active** Application registered with MPLS LSD and is functioning correctly. **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. **Zombie** Application not reregistered after an unexpected termination. In this case, RecoveryTime indicates how many seconds are left before MPLS LSD gives up on the application.
RecoveryTime	Seconds remaining before MPLS LSD gives up or resumes the application.
Node	Node expressed in standard *rack*/*slot*/*module* notation.

Related Commands

Command	Description
show mpls lsd clients, on page 38	Displays MPLS clients connected to the MPLS LSD server.

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 EXEC mode.

show mpls lsd clients

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.12	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 7: 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.

Related Commands

Command	Description
show mpls lsd applications, on page 36	Displays MPLS applications registered with the MPLS LSD server.

show mpls lsd forwarding labels

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

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

Syntax Description

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

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.12	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
```

Related Commands

Command	Description
show mpls forwarding summary, on page 26	Displays the contents of the MPLS label security information.

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 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**] [**summary**] [**fullname**] [**location** *node-id*]

Syntax Description

ip-address	(Optional) IP address of the destination network.
ip-address/length	(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 *tunnel-id*	(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.
type	(Optional) Interface type. For more information, use the question mark (?) online help function.
interface-path-id	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 *node-id*	(Optional) Displays hardware resource counters on the designated node.
fullname	(Optional) Displays full name of named tunnels in the command output.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.5.4	The **fullname** keyword was added to the command.
Release 7.0.12	This command was introduced.

Usage Guidelines

If the location is specified, Fast-Reroute (FRR) entries for both Point-to-Point (P2P) and P2MP tunnels are available. If the location is not specified, only P2P tunnel entries are available.

The **show mpls traffic-eng fast-reroute database** command when used with the **fullname** option, displays a complete name of the named interfaces in the output.

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
```

```
Tunnel head FRR information:
Tunnel      Out intf/label    FRR intf/label   Status
----------  ----------------- ---------------- -------
tt4000       PO0/3/0/0:34     tt1000:34        Ready
tt4001       PO0/3/0/0:35     tt1001:35        Ready
tt4002       PO0/3/0/0:36     tt1001:36        Ready
```

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/        FRR Intf/        Status
                                Label            Label
------------------------------  ---------------- ---------------- -------
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 pos0/3/0/0

  Tunnel head FRR information:
  Tunnel      Out intf/label   FRR intf/label   Status
  ----------  ---------------- ---------------- -------
  tt4000       PO0/3/0/0:34     tt1000:34        Ready
  tt4001       PO0/3/0/0:35     tt1001:35        Ready
  tt4002       PO0/3/0/0:36     tt1001:36        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:routerr# show mpls traffic-eng fast-reroute database role midpoint summary

  Status     Count
  -------    -----
  Active     0
  Ready      2
  Partial    0
```

This example displays entries associated with the midpoint tunnel on the designated node with a complete name of the interfaces using the **fullname** option:

```
Router# show mpls traffic-eng fast-reroute database role midpoint fullname location 0/0/CPU0

Wed Feb  1 13:55:43.534 EST
LSP midpoint FRR information:
LSP identifier                                        In-label Out Intf : Label
        FRR Intf : Label                          Status
------------------------------------------------------ --------
------------------------------- ---------------------------------------- -------
R1_t1                                                    24005    GigabitEthernet0/2/0/3:24005
     tunnel-te10000:Pop                          Ready
Router#
```

This table describes the significant fields shown in the display.

Table 8: show mpls traffic-eng fast-reroute database Command Field Descriptions

Field	Description
Tunnel	Short form of tunnel interface name.
Out intf/label	**Out interface** Short name of the physical interface through which traffic goes to the protected link. **Out label** At a tunnel head, this is the label that the tunnel destination device advertises. The value "Unlabeled" indicates that no such label is advertised. 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.

Field	Description
FRR intf/label	**Fast reroute interface** Backup tunnel interface. **Fast reroute label** 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. At a tunnel midpoint, this has the same value as the Out label.
Status	State of the rewrite: partial, ready, or active.

Related Commands

Command	Description
show mpls traffic-eng fast-reroute log, on page 46	Displays the contents of the FRR event log.

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 EXEC mode.

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

Syntax Description

interface	(Optional) Displays all FRR events for the selected protected interface.
type	(Optional) Interface type. For more information, use the question mark (?) online help function.
interface-path-id	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 *node-id*	(Optional) Displays all FRR events that occurred on the selected node.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.12	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 log** command:

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

  Node     Protected LSPs  Rewrites When                    Switching Time
           Interface                                           (usec)
  -------- --------- ----- -------- ---------------------- --------------
  0/0/CPU0 PO0/1/0/1 1     1        Feb 27 19:12:29.064000      147
```

This table describes the significant fields shown in the display.

Table 9: 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[4] 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.

[4] LSP = Link-state Packet.

Related Commands

Command	Description
show mpls traffic-eng fast-reroute database, on page 41	Displays the contents of the FRR database.