# MPLS Label Distribution Protocol Commands

# address-family ipv4/ipv6 label

To configure label control and policies on a specific IPv4 or IPv6 destination, use the **address-family ipv4/ipv6 label** command in the MPLS LDP configuration mode.

[ **vrf** *vrf-name* ] **address-family** {**ipv4** | **ipv6**}
**label** [**remote accept from** *ldp-id* **for** *prefix-acl*]
**local** [**default-route**] [**allocate for** {*prefix-acl* | **host-routes**}]
[ **advertise** [**to** *ldp-id* **for** *prefix-acl*]
[**interface** *type interface-path-id* ] ]

| Syntax Description | | |
|---|---|---|
| **address-family** | | Configure address-family and its parameters. |
| **ipv4** | | Specifies IP version 4 address family. |
| **ipv6** | | Specifies IP version 6 address family. |
| **label** | | (Optional) Configure label control and policies. |
| **remote** | | (Optional) Configure remote/peer label control and policies. |
| **accept** | | (Optional) Configure inbound label acceptance control. |
| **from** *ldp-id* | | Specifies which LDP neighbors will receive label advertisements. LDP ID is written in A.B.C.D: format. |
| **for** *prefix-acl* | | Specifies prefix destinations for which labels will be advertised. |
| **local** | | (Optional) Configure local label control and policies. |
| **default-route** | | (Optional) Enable MPLS forwarding for default route. |
| **allocate** | | (Optional) Configure label allocation control. |
| **for** *prefix-acl* | | Specifies prefix destinations for which labels will be allocated. |
| **host-routes** | | Allocates labels for host routes only. |

| | |
|---|---|
| **advertise** | (Optional) Configure outbound label advertisement control. |
| **to** *ldp-id* | (Optional) Specifies which LDP neighbors will receive label advertisements. LDP ID is written in A.B.C.D: format. |
| **for** *prefix-acl* | (Optional) Specifies prefix destinations for which labels will be advertised. |
| **interface** | (Optional) Advertise interface host address. |
| *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. |

**Command Default**  No default behavior or values

**Command Modes**  MPLS LDP configuration

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced |

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

**Task ID**

| Task ID | Operation |
|---|---|
| mpls-ldp | read, write |

**Example**

The following example shows how to configure label control and policies on a specific IPv4 destination:

```
RP/0/RP0/CPU0:router(config-ldp)# address-family ipv4 label
```

# backoff

To configure the parameters for the Label Distribution Protocol (LDP) backoff mechanism, use the **backoff** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**backoff** *initial* *maximum*
**no** **backoff**

| **Syntax Description** | *initial* | Initial backoff delay, in seconds. Range is 5 to 2147483 50331. |
| --- | --- | --- |
| | *maximum* | Maximum backoff delay, in seconds. Range is 5 to 2147483 50331. |

**Command Default**    *initial* : 15

*maximum* : 120

**Command Modes**    MPLS LDP configuration

| **Command History** | **Release** | **Modification** |
| --- | --- | --- |
| | Release 7.0.12 | This command was introduced. |

**Usage Guidelines**    The LDP backoff mechanism prevents two incompatibly configured label switch routers from engaging in an unthrottled sequence of session setup failures. If a session setup attempt fails (due to incompatibility), each Label Switching Router (LSR) delays the next attempt, increasing the delay exponentially with each successive failure until the maximum backoff delay is reached.

| **Task ID** | **Task ID** | **Operations** |
| --- | --- | --- |
| | mpls-ldp | read, write |

**Examples**    The following example shows how to configure the initial backoff delay to 30 seconds and the maximum backoff delay to 240 seconds:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# mpls ldp
RP/0/RP0/CPU0:router(config-ldp)# backoff 30 240
```

# clear mpls ldp forwarding

To clear (or reset) the MPLS Label Distribution Protocol (LDP) forwarding rewrites, use the **clear mpls ldp forwarding** command in XR EXEC mode.

**clear mpls ldp** [**vrf** *vrf-name*] [**ipv4** | **ipv6**] **forwarding** [*prefix/length* ]

| Syntax Description | | |
|---|---|---|
| | **vrf** *vrf-name* | (Optional) Clears the VRF information for the specified VRF. |
| | **ipv4** | (Optional) Specifies IP version 4 address family. |
| | **ipv6** | (Optional) Specifies IP version 6 address family. |
| | *prefix* | (Optional) Destination prefix, written in A.B.C.D format. |
| | *length* | (Optional) Network mask length, in bits. Range is 0 to 32. |

**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**  This command resets LDP installed forwarding state for all prefixes or a given prefix. It is useful when installed LDP forwarding state needs to be reprogrammed in LSD and MPLS forwarding.

**Task ID**

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

**Example**

This example shows how to clear (or reset) the MPLS LDP forwarding rewrites using the **clear mpls ldp forwarding** command:

```
RP/0/RP0/CPU0:router# clear mpls ldp forwarding
```

# clear mpls ldp neighbor

To force Label Distribution Protocol (LDP) session restart, use the **clear mpls ldp neighbor** command in mode.

**clear mpls ldp** [**vrf all**] [**vrf** *vrf-name*] **neighbor** [*ip-address ldp-id*]

| Syntax Description | | |
|---|---|---|
| **vrf all** | | (Optional) Clears all LDP configured VRF neighbors. |
| **vrf** *vrf-name* | | (Optional) Clears the VRF information for the specified VRF. |
| *ip-address* | | (Optional) Neighbor IP address. |
| *ldp-id* | | (Optional) Neighbor LDP ID in A.B.C.D: format. |

**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**    Use the **clear mpls ldp neighbor** command to restart a single LDP session or all LDP sessions (without restarting the LDP process itself).

**Task ID**

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

**Examples**    The following example shows how to force an unconditional LDP session restart:

```
RP/0/RP0/CPU0:router# clear mpls ldp neighbor 10.20.20.20
```

# clear mpls ldp nsr statistics neighbor

To clear the nonstop routing (NSR) statistics, use the **clear mpls ldp nsr statistics neighbor** command in XR EXEC mode.

**clear mpls ldp** [**vrf** *vrf-name*] **nsr statistics neighbor** [*lsr-id ldp-id*]

| Syntax Description | | |
|---|---|---|
| **vrf** *vrf-name* | | (Optional) Displays the VRF information for the specified VRF. |
| *lsr-id* | | (Optional) LSR ID of neighbor in A.B.C.D format. |
| *ldp-id* | | (Optional) LDP ID of neighbor in A.B.C.D: format. |

**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**     No specific guidelines impact the use of this command.

**Task ID**

| Task ID | Operation |
|---|---|
| mpls-ldp | read |

**Example**

The following example shows how to clear NSR statistics for neighbor 10.20.20.20:

```
RP/0/RP0/CPU0:router#clear mpls ldp nsr statistics neighbor 10.20.20.20
```

# clear mpls ldp msg-counters neighbor

To clear the Label Distribution Protocol (LDP) message counters, use the **clear mpls ldp msg-counters neighbor** command in  mode.

**clear mpls ldp**  [**vrf**  *vrf-name*]  **msg-counters neighbor**  [*lsr-id ldp-id*]

| Syntax Description | | |
|---|---|---|
| **vrf** *vrf-name* | | (Optional) Clears the VRF information for the specified VRF. |
| *lsr-id* | | LSR ID of neighbor in A.B.C.D format. |
| *ldp-id* | | LDP ID of neighbor in A.B.C.D: format. |

**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**  Use the **clear mpls ldp msg-counters neighbor** command to clear the statistics on message counters for a specific neighbor (IP address) or for all neighbors. These message counters count the number of LDP protocol messages sent to and received from LDP neighbors.

**Task ID**

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

**Examples**  The following example shows how to clear message counters for neighbor 10.20.20.20:

```
RP/0/RP0/CPU0:router# clear mpls ldp msg-counters neighbor 10.20.20.20
```

# conditional minimum-one-labelled-nexthop

To configure LDP's next-hop labels advertisement or withdrawal conditions when a router's next-hop becomes completely unlabelled due to the failure of all its associated tunnels or interfaces, use the **conditional minimum-one-labelled-nexthop** command in MPLS LDP configuration mode.

**address-family** { **ipv4** | **ipv6** } **label** **local** **advertise** **conditional minimum-one-labelled-nexthop**

| Syntax Description | | |
|---|---|---|
| | **address-family ipv4** | Specifies IP version 4 address family. |
| | **address-family ipv6** | Specifies IP version 6 address family. |
| | **label** | Configures label control and policies. |
| | **local** | Configures local label control and policies. |
| | **advertise** | Configures outbound label advertisement control. |
| | **conditional minimum-one-labelled-nexthop** | Specifies minimum one labeled next hop that must be present for an LDP session or for a particular route which is considered to be valid in the MPLS Label Forwarding Information Base (LFIB). |

**Command Default**

By default, conditional minimum-one-labelled-nexthop is disabled.

**Command Modes**

MPLS LDP configuration

**Command History**

| Release | Modification |
|---|---|
| Release 24.2.11 | This command was introduced. |

**Usage Guidelines**

No specific guidelines impact the use of this command.

**Task ID**

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

**Examples**

The following command shows how to configure conditional minimum-one-labelled-nexthop:

```
Router# configure
Router(config)# mpls ldp
Router(config-ldp)# address-family ipv4
Router(config-ldp-af)# label local advertise conditional minimum-one-labelled-nexthop
Router(config-ldp-af)# exit
```

# debug mpls ldp rsi

To enable the display of MPLS LDP router space infrastructure (RSI) debugging events, use the **debug mpls ldp rsi** command in XR EXEC mode. To disable the display of MPLS LDP RSI debugging information, use the **no** form of this command.

**debug mpls ldp rsi** [**location** *node-id*]
**no debug mpls ldp rsi** [**location** *node-id*]

| Syntax Description | **location** *node-id* | (Optional) Displays location information for the specified node ID. |
|---|---|---|

**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**   No specific guidelines impact the use of this command.

**Task ID**

| Task ID | Operation |
|---|---|
| mpls-ldp | read |

**Example**

The following example shows how to enable MPLS LDP RSI debugging events:

```
RP/0/RP0/CPU0:router# debug mpls ldp rsi
```

# debug mpls ldp vrf

To enable the display of MPLS LDP virtual routing and forwarding (VRF) debugging events, use the **debug mpls ldp vrf** command in XR EXEC mode. To disable the display of MPLS LDP VRF debugging information, use the **no** form of this command.

**debug mpls ldp vrf** [**location** *node-id*]
**no debug mpls ldp vrf** [**location** *node-id*]

| Syntax Description | **location** *node-id* | (Optional) Displays location information for the specified node ID. |
| --- | --- | --- |

**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**    No specific guidelines impact the use of this command.

**Task ID**

| **Task ID** | **Operation** |
| --- | --- |
| mpls-ldp | read |

**Example**

The following example shows how to enable MPLS LDP VRF debugging events:

```
RP/0/RP0/CPU0:router# debug mpls ldp vrf
```

# default-route

To enable Multiprotocol Label Switching (MPLS) switching for IP default route by allocating and advertising non-null label, use the **default-route** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**default-route**
**no default-route**

**Syntax Description**

This command has no arguments or keywords.

**Command Default**

Allocates null (implicit or explicit) local label for IP default route prefix 0.0.0.0/0.

**Command Modes**

MPLS LDP configuration

**Command History**

| Release | Modification |
|---------|--------------|
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**

When the IP default route 0.0.0.0/0 is configured on an egress router, it is advertised through Interior Gateway Protocol (IGP) to other routers to enable default IP forwarding. When MPLS LDP is configured and establishing label switch paths (LSPs) for other prefixes, you can emulate default forwarding and switching for MPLS in the same way as IP forwarding. To do so, allocate a non-null local label and advertise this label to its peers.

**Task ID**

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

**Examples**

The following example shows how to enable default MPLS switching for default prefix:

```
RP/0/RP0/CPU0:router(config-ldp)# default-route
```

# default-vrf implicit-ipv4 disable

To disable the implicitly enabled IPv4 address family for default VRF, use the **default-vrf implicit-ipv4 disable** command in MPLS LDP configuration mode.

**default-vrf  implicit-ipv4disable**

This command has no keywords or arguments.

| | |
|---|---|
| **Command Default** | No default behavior or values |
| **Command Modes** | MPLS LDP configuration |

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

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

**Task ID**

| Task ID | Operation |
|---|---|
| mpls ldp | read, write |

**Example**

The following example shows how to disable the implicitly enabled IPv4 address family for default VRF:

```
RP/0/0/CPU0:ios#configure
RP/0/0/CPU0:ios(config)#mpls ldp
RP/0/0/CPU0:ios(config-ldp)#router-id 5.5.5.5
RP/0/0/CPU0:ios(config-ldp)#default-vrf implicit-ipv4 disable
```

# discovery hello

To configure the interval between transmission of consecutive Label Distribution Protocol (LDP) discovery hello messages and the holdtime for a discovered LDP neighbor, use the **discovery hello** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**discovery hello**   {**holdtime**  *seconds* | **interval**  *seconds*}
**no** **discovery hello**   {**holdtime** | **interval**}

| Syntax Description | | |
|---|---|---|
| | **holdtime** | Sets the time, in seconds, a discovered LDP neighbor is remembered without receipt of an LDP hello message from the neighbor. Default is 15. |
| | **interval** | Sets the time, in seconds, between consecutive hello messages. Default is 5. |
| | *seconds* | Time value, in seconds. Range is 1 to 65535 (65535 means infinite). |

**Command Default**    **holdtime**: 15

**interval**: 5

**Command Modes**    MPLS LDP configuration

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

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

**Task ID**

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

**Examples**    The following example shows how to configure the link hello holdtime to 30 seconds:

```
RP/0/RP0/CPU0:router(config-ldp)# discovery hello holdtime 30
```

The following example shows how to configure the link hello interval to 10 seconds:

```
RP/0/RP0/CPU0:router(config-ldp)# discovery hello interval 10
```

# discovery instance-tlv disable

To disable transmit and receive processing for Type-Length-Value (TLV), use the **discovery instance-tlv disable** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**discovery instance-tlv disable**
**no discovery instance-tlv disable**

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

**Command Default**    No default behavior or values

**Command Modes**    MPLS LDP configuration

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

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

**Task ID**

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

**Examples**    The following example shows how to disable transmit and receive processing for TLV:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# mpls ldp
RP/0/RP0/CPU0:router(config-ldp)# discovery instance-tlv disable
```

# discovery targeted-hello

To configure the interval between transmission of consecutive Label Distribution Protocol (LDP) discovery targeted-hello messages, the hold time for a discovered targeted LDP neighbor, and to accept targeted hello from peers, use the **discovery targeted-hello** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**discovery targeted-hello  address-family**  {**ipv4** | **ipv6**} {**accept** | [**from** *acl*] | **holdtime** *seconds* | **interval** *seconds*}
**no  discovery targeted-hello**  {**accept** | **holdtime** | **interval**}

| | |
|---|---|
| **Syntax Description** | |

| | |
|---|---|
| **accept** | Accepts targeted hellos from any source. |
| **ipv4** | Specifies IP version 4 address family. |
| **ipv6** | Specifies IP version 6 address family. |
| **from** *acl* | (Optional) Accepts targeted hellos from LDP peers as permitted by the access-list. |
| **holdtime** | Configures the time a discovered LDP neighbor is remembered without receipt of an LDP hello message from a neighbor. |
| **interval** | Displays time between consecutive hello messages. |
| *seconds* | Time value, in seconds. Range is 1 to 65535. |

**Command Default**

**accept** : Targeted hello messages are not accepted from any source (neighbor).

**holdtime** : 90

**interval** : 10

**Command Modes**   MPLS LDP configuration

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**   LDP supports IPv4 standard access lists only.

**Task ID**

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

**Examples**

The following example shows how to configure the targeted-hello holdtime to 45 seconds:

```
RP/0/RP0/CPU0:router(config-ldp)# discovery targeted-hello holdtime 45
```

The following example shows how to configure the targeted-hello interval to 5 seconds:

```
RP/0/RP0/CPU0:router(config-ldp)# discovery targeted-hello interval 5
```

The following example shows how to configure acceptance of targeted hellos from all peers:

```
RP/0/RP0/CPU0:router(config-ldp)# discovery targeted-hello accept
```

The following example shows how to configure acceptance of targeted hello from peers 10.1.1.1 and 10.2.2.2 only:

```
RP/0/RP0/CPU0:router(config)# ipv4 access-list peer_acl_10
RP/0/RP0/CPU0:router(config-ipv4-acl)# permit 10.1.1.1
RP/0/RP0/CPU0:router(config-ipv4-acl)# permit 10.2.2.2
RP/0/RP0/CPU0:router(config-ldp)# discovery targeted-hello accept from peer_acl_10
```

# discovery transport-address

To provide an alternative address for a TCP connection, use the **discovery transport-address** command in MPLS LDP interface configuration mode. To return to the default behavior, use the **no** form of this command.

[**vrf** *vrf-name* ][**interface** *type interface-path-id*] **address-family**
**ipv4** | **ipv6**
**discovery transport-address** {*ip-address* | **interface**}
**no** [**vrf** *vrf-name* ][**interface** *type interface-path-id* **address-family**] {**ipv4** | **ipv6**} **discovery**
**transport-address** {*ip-address* | **interface**}

| | |
|---|---|
| **Syntax Description** | |

| | |
|---|---|
| **vrf** *vrf-name* | (Optional) Specifies the VRF name. |
| **interface** *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. |
| **address-family ipv4** | Specifies IP version 4 address family. |
| **ipv6** | Specifies IP version 6 address family. |
| *ip-address* | IP address to be advertised as the transport address in discovery hello messages. |
| **interface** | Advertises the IP address of the interface as the transport address in discovery hello messages. |

**Command Default**  LDP advertises its LDP router ID as the transport address in LDP discovery hello messages.

**Command Modes**  MPLS LDP interface configuration

| Command History | Release | Modification |
|---|---|---|
| | Release 7.0.12 | This command was introduced. |

**Usage Guidelines**

Establishing an LDP session between two routers requires a TCP session connection. To establish the TCP session connection, each router must know the transport address (IP address) of the other router.

The LDP discovery mechanism provides the means for a router to advertise transport addresses. Transport address is implicit or explicit. Implicit addresses do not appear as part of the contents of the discovery hello messages sent to the peer. If explicit, the advertisement appears as part of the contents of discovery hello messages sent to the peer.

The **discovery transport-address** command modifies the default behavior described above. Using the **interface** keyword, LDP advertises the IP address of the interface in LDP discovery hello messages sent from the interface. Using the *ip-address* argument, LDP advertises the IP address in LDP discovery hello messages sent from the interface.

**Note**

When a router has multiple links connecting it to its peer device, the router must advertise the same transport address in the LDP discovery hello messages it sends on all such interfaces.

**Task ID**

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

**Examples**

The following example shows how to specify an exiting address (10.10.3.1) as the transport address on an interface HundredGigE 0/1/0/0:

```
RP/0/RP0/CPU0:router(config-ldp)# interface POS 0/1/0/0interface POS 0/1/0/0
RP/0/RP0/CPU0:router(config-ldp-if)# address-family ipv4
RP/0/RP0/CPU0:router(config-ldp-if-af)#discovery transport-address 10.10.3.1

RP/0/RP0/CPU0:router# show mpls ldp neighbor

  Peer LDP Identifier: 10.44.44.44:0
    TCP connection: 10.44.44.44:65520 - 10.10.3.1:646
    Graceful Restart: Yes (Reconnect Timeout: 15 sec, Recovery: 180 sec)
    State: Oper; Msgs sent/rcvd: 13/9
    Up time: 00:00:11
    LDP Discovery Sources:
        POS 0/1/0/0
    Addresses bound to this peer:
      10.10.3.2       10.44.44.44
```

# downstream-on-demand

To configure MPLS Label Distribution Protocol (LDP) downstream-on-demand mode, use the **downstream-on-demand** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

[**vrf** *vrf-name* **session**]
**downstream-on-demand** **with** *access-list*
**no** [**vrf** *vrf-name* **session**] **downstream-on-demand** **with** *access-list*

| Syntax Description | | |
|---|---|---|
| | **vrf** *vrf-name* | (Optional) Displays the VRF information for the specified VRF. |
| | **session** | (Optional) Configures session parameters. |
| | **with** | Displays access list of LDP peers. |
| | *access-list* | IPv4 access-list name. |

**Command Default**  No default behavior or values

**Command Modes**  MPLS LDP configuration

| Command History | Release | Modification |
|---|---|---|
| | Release 7.0.12 | This command was introduced. |

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

**Task ID**

| Task ID | Operation |
|---|---|
| mpls-ldp | read, write |

**Examples**

This is a sample output from the **downstream-on-demand** command:

```
RP/0/RP0/CPU0:router(config-ldp)# downstream-on-demand with access-list
```

# explicit-null

To configure a router to advertise explicit null labels instead of implicit null labels, use the **explicit-null** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

[**vrf** *vrf-name*] **address-family** {**ipv4** | **ipv6**} **label local advertise explicit-null** [**to** *peer-acl* | **for** *prefix-acl* [**to** *peer-acl*]]
**no** [**vrf** *vrf-name*] **address-family** {**ipv4** | **ipv6**} **label local advertise explicit-null** [**to** *peer-acl* | **for** *prefix-acl* [**to** *peer-acl*]]

| Syntax Description | | |
|---|---|---|
| **vrf** *vrf-name* | | (Optional) Specifies the VRF name. |
| **address-family ipv4** | | Specifies IP version 4 address family. |
| **ipv6** | | Specifies IP version 6 address family. |
| **label** | | Configures label control and policies. |
| **local** | | Configures local label control and policies. |
| **advertise** | | Configures outbound label advertisement control. |
| **to** *peer-acl* | | (Optional) Specifies LDP peers for which explicit-null is advertised instead of implicit-null. Range is 1 to 99. |
| **for** *prefix-acl* | | (Optional) Specifies prefixes for which explicit-null is advertised instead of implicit-null. Range is 1 to 99. |

**Command Default**     Implicit null is advertised as default null label for routes, such as directly connected routes.

**Command Modes**     MPLS LDP configuration

| Command History | Release | Modification |
|---|---|---|
| | Release 7.0.12 | This command was introduced. |

**Usage Guidelines**     Normally, LDP advertises an implicit null label for directly connected routes. The implicit null label causes the previous hop router to perform next to last router hop popping.

The **explicit-null** command advertises the explicit-null labels in place of implicit null labels for directly connected prefixes.

LDP supports IPv4 standard access lists only.

**Task ID**

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

**Examples**

The following command shows how to advertise explicit null for all directly connected routes to all LDP peers:

```
RP/0/RP0/CPU0:router(config-ldp-af-lbl-lcl-advt)# explicit-null
```

The following command sequence shows how to advertise explicit-null for directly connected route 192.168.0.0 to all LDP peers and implicit-null for all other directly connected routes:

```
RP/0/RP0/CPU0:router(config)# ipv4 access-list pfx_acl_192_168
RP/0/RP0/CPU0:router(config-ipv4-acl)# permit 192.168.0.0
RP/0/RP0/CPU0:router(config-ldp-af-lbl-lcl-advt)# explicit-null for pfx_acl_192_168
```

The following command sequence shows how to send explicit-null for all directly connected routes to peers 10.1.1.1 and 10.2.2.2 and implicit-null to all other peers:

```
RP/0/RP0/CPU0:router(config)# ipv4 access-list peer_acl_10
RP/0/RP0/CPU0:router(config-ipv4-acl)# permit 10.1.1.1
RP/0/RP0/CPU0:router(config-ipv4-acl)# permit 10.2.2.2
RP/0/RP0/CPU0:router(config-ldp-af-lbl-lcl-advt)# explicit-null to peer_acl_10
```

The following command shows how to advertise explicit-null for prefix 192.168.0.0 to peers 10.1.1.1 and 10.2.2.2 and advertise implicit-null for all other applicable routes to all other peers:

```
RP/0/RP0/CPU0:router(config-ldp-af-lbl-lcl-advt)# explicit-null for pfx_acl_192_168 to
peer_acl_10
```

# graceful-restart (MPLS LDP)

To configure graceful restart, use the **graceful-restart** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**graceful-restart** [**reconnect-timeout** *seconds* | **forwarding-state-holdtime** *seconds*]
**no graceful-restart** [**reconnect-timeout** | **forwarding-state-holdtime**]

| Syntax Description | | |
|---|---|---|
| **reconnect-timeout** *seconds* | | (Optional) Configures the time that the local LDP sends to its graceful restartable peer, indicating how long its neighbor should wait for reconnection in the event of a LDP session failure, in seconds. Range is 60 to 1800. |
| **forwarding-state-holdtime** *seconds* | | (Optional) Configures the time the local forwarding state is preserved (without being reclaimed) after the local LDP control plane restarts, in seconds. Range is 60 to 1800. |

**Command Default**

By default, graceful restart is disabled.

**reconnect-timeout**: 120

**forwarding-state-holdtime**: 180

**Command Modes**

MPLS LDP configuration

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**

Use the LDP graceful restart capability to achieve nonstop forwarding (NSF) during an LDP control plane communication failure or restart. To configure graceful restart (MPLS LDP) between two peers, enable LDP graceful restart on both label switch routers (LSRs).

When an LDP graceful restart session is established and there is control plane failure, the peer LSR starts graceful restart procedures, initially keeps the forwarding state information pertaining to the restarting peer, and marks this state as stale. If the restarting peer does not reconnect within the reconnect timeout, the stale forwarding state is removed. If the restarting peer reconnects within the reconnect time period, it is provided recovery time to resynchronize with its peer. After this time, any unsynchronized state is removed.

The value of the forwarding state hold time keeps the forwarding plane state associated with the LDP control-plane in case of a control-plane restart or failure. If the control plane fails, the forwarding plane retains the LDP forwarding state for twice the forwarding state hold time. The value of the forwarding state hold time is also used to start the local LDP forwarding state hold timer after the LDP control plane restarts. When the LDP graceful restart sessions are renegotiated with its peers, the restarting LSR sends the remaining value

of this timer as the recovery time to its peers. Upon local LDP restart with graceful restart enabled, LDP does not replay forwarding updates to MPLS forwarding until the forwarding state hold timer expires.

> **Note** In the presence of a peer relationship, any change to the LDP graceful restart configuration will restart LDP sessions. If LDP configuration changes from nongraceful restart to graceful restart, all the sessions are restarted. Only graceful restart sessions are restarted upon graceful restart to nongraceful restart configuration changes.

**Task ID**

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

**Examples**

The following example shows how to configure an existing session for graceful restart:

```
RP/0/RP0/CPU0:router(config-ldp)# graceful-restart

RP/0/RP0/CPU0:router:Apr  3 10:56:05.392 : mpls_ldp[336]: %ROUTING-LDP-5-NBR_CHANGE : Nbr
172.16.0.1:0, DOWN
RP/0/RP0/CPU0:router:Apr  3 10:56:05.392 : mpls_ldp[336]: %ROUTING-LDP-5-NBR_CHANGE : Nbr
192.168.0.1:0, DOWN
RP/0/RP0/CPU0:router:Apr  3 10:56:09.525 : mpls_ldp[336]: %ROUTING-LDP-5-NBR_CHANGE : Nbr
192.168.0.1:0, UP
RP/0/RP0/CPU0:router:Apr  3 10:56:11.114 : mpls_ldp[336]: %ROUTING-LDP-5-NBR_CHANGE : Nbr
172.16.0.1:0, UP

RP/0/RP0/CPU0:router# show mpls ldp neighbor brief

  Peer               GR Up Time          Discovery Address
  ----------------- -- --------------- --------- -------
  192.168.0.1:0         Y  00:01:04               3      8
  172.16.0.1:0          N  00:01:02               2      5

RP/0/RP0/CPU0:router# show mpls ldp graceful-restart

   Forwarding State Hold timer : Not Running
   GR Neighbors              : 1

   Neighbor ID      Up  Connect Count  Liveness Timer      Recovery Timer
   -------------- -- ------------ ------------------ ------------------
   192.168.0.1          Y        1                   -                   -
```

# session holdtime (MPLS LDP)

To change the time for which an Label Distribution Protocol (LDP) session is maintained in the absence of LDP messages from the session peer, use the **session holdtime** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**session  holdtime**  *seconds*
**no  session  holdtime**

| | |
|---|---|
| **Syntax Description** | *seconds*  Time, in seconds, that an LDP session is maintained in the absence of LDP messages from the session peer. Range is 15 to 65535. |

**Command Default**   *seconds*: 180

**Command Modes**   MPLS LDP configuration

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

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

**Task ID**

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

**Examples**

The following example shows how to change the hold time of LDP sessions to 30 seconds:

```
RP/0/RP0/CPU0:router(config-ldp)# session holdtime 30
```

# hw-module label-allocation bvi-routes disable

To disable label allocation for prefixes whose next hop is over bridge-group virtual interface (BVI), use the **hw-module label-allocation bvi-routes disable** command in System Admin Config mode. To enable label allocation over BVI, use the **no** form of this command.

**hw-module label-allocation bvi-routes disable**
**no hw-module label-allocation bvi-routes disable**

This command has no keywords or arguments.

**Command Default**     Label allocation is enabled and LDP is configurable for BVI.

**Command Modes**     System Admin Config

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**

**Note**     This configuration is required only when ASR 9000 Ethernet Line Cards are used as the MPLS-core facing cards. This configuration is not required on ASR 9000 Enhanced Ethernet Line Cards. MPLS LDP over BVI is not supported on ASR 9000 Ethernet Line Cards.

You need to unconfigure and reconfigure MPLS LDP for both the **hw-module label-allocation bvi-routes disable** and the **no hw-module label-allocation bvi-routes disable** configurations to take effect. The **hw-module label-allocation bvi-routes disable** configuration disables label allocation for BVI routes. The BVI routes should also be explicitly mentioned as static and dynamic. This configuration does not prevent labels being assigned to Recursive Static routes that point to the gateway on the BVI interface. Such recursive static routes have to be modified to include the BVI interface modifier to turn those into non-recursive routes.

When this configuration is committed, it will be present in the admin mode running configuration. However, labels already advertised need to be withdrawn by LDP. To withdraw the previously advertised routes, first unconfigure MPLS LDP and then reconfigure MPLS LDP (to advertise labels for non-BVI routes).

**Note**     The **no hw-module label-allocation bvi-routes disable** will not appear in the admin mode running configuration, once committed.

If LDP was enabled on BVI, it needs to be removed before unconfiguring/configuring MPLS LDP. Otherwise, LDP configuration will be rejected as the **hw-module label-allocation bvi-routes disable** configuration prevents LDP to be configured for BVI. When this command is configured, if the same route is reachable over ECMP paths and one of the paths is BVI, a label will not be allocated.

**Task ID**

| Task ID | Operation |
| --- | --- |
| root-lr | read, write |

This example shows how to disable label allocation for BVI routes:

```
RP/0/RP0/CPU0:router#admin
RP/0/RP0/CPU0:router(admin)#configure
RP/0/RP0/CPU0:router(admin-config)#hw-module label-allocation bvi-routes disable
```

# hw-module profile cef te-tunnel highscale-no-ldp-over-te

To increase the TE tunnel capacity to more than 1000 tunnels, use the **hw-module profile cef te-tunnel highscale-no-ldp-over-te** command in global configuration mode. To revert to a 1000 TE tunnel capacity, and enable the LDP over TE feature, use the **no** form of the command.

**hw-module profile cef te-tunnel highscale-no-ldp-over-te**

This command has no keywords or arguments.

**Command Default**

A TE tunnel capacity of 1000 tunnels is supported.

**Command Modes**

Global configuration (config)

**Command History**

| Release | Modification |
|---------|--------------|
| Release 7.3.1 | This command was introduced. |
| Release 7.5.3 | A TE tunnel capacity of was increased from 1000 to 8000 tunnels. |

**Usage Guidelines**

LDP can be run over an RSVP TE network through a targeted LDP session between the edge routers of the RSVP TE network. In the Cisco IOS XR Release 7.3.1, LDP over TE function is automatically enabled, with support for 1000 TE tunnels.

If you need to run more than 1000 tunnels, enable this command on the edge routers. However, the LDP over TE feature gets disabled with this configuration.

Starting from Cisco IOS XR Release 7.5.3, there is an increase in the number of TE tunnels. You can now run up to 8000 TE tunnels. However, when you use 8000 tunnels, the LDP over TE feature is disabled.

**Task ID**

| Task ID | Operation |
|---------|-----------|
| mpls ldp | read, write |

**Example**

This example shows how to increase the TE tunnel capacity:

```
Router# configure terminal
Router(config)# hw-module profile cef te-tunnel highscale-no-ldp-over-te
Router(config)# commit
Router# reload
```

# hw-module profile cef te-tunnel highscale-ldp-over-te-no-sr-over-srte

To increase the TE tunnel capacity to 4000 tunnels, use the **hw-module profile cef te-tunnel highscale-ldp-over-te-no-sr-over-srte** command in global configuration mode. To revert to a 1000 TE tunnel capacity, and enable the LDP over TE feature, use the **no** form of the command.

**hw-module profile cef te-tunnel highscale-ldp-over-te-no-sr-over-srte**

This command has no keywords or arguments.

**Command Default**

A TE tunnel capacity of 4000 tunnels is supported.

**Command Modes**

Global configuration (config)

**Command History**

| Release | Modification |
|---|---|
| Release 7.5.3 | This command was introduced. |

**Usage Guidelines**

LDP can be run over an RSVP TE network through a targeted LDP session between the edge routers of the RSVP TE network. The LDP over TE function is automatically enabled with support for 1000 TE tunnels.

If you need 4000 tunnels without losing LDP over TE feature, enable this command on the edge routers.

**Task ID**

| Task ID | Operation |
|---|---|
| mpls ldp | read, write |

**Example**

The following example shows how to increase the TE tunnel capacity to 4000 tunnels:

```
Router# configure
Router(config)# hw-module profile cef te-tunnel highscale-ldp-over-te-no-sr-over-srte
Router(config)# commit
Router# reload
```

# igp auto-config disable

To disable Label Distribution Protocol (LDP) auto-configuration, use the **igp auto-config disable** command in MPLS LDP interface configuration mode. To return to the default behavior, use the **no** form of this command.

**igp auto-config disable**
**no igp auto-config disable**

| **Syntax Description** | This command has no arguments or keywords. |
|---|---|
| **Command Default** | No default behavior or values |
| **Command Modes** | MPLS LDP interface configuration |

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**  IGP auto-configuration can be enabled on ISIS and OSPF. Configuration details are described in *Routing Configuration Guide for Cisco NCS 5500 Series Routers*.

**Task ID**

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

**Examples**  The following example shows how to disable LDP auto-configuration on POS 0/1/0/3:

```
RP/0/RP0/CPU0:router(config)# mpls ldp
RP/0/RP0/CPU0:router(config-ldp)# interface pos 0/1/0/3
RP/0/RP0/CPU0:router(config-ldp-if)# igp auto-config disable
```

# igp sync delay

To enable Label Distribution Protocol (LDP) Interior Gateway Protocol (IGP) sync delay timer feature, use the **igp sync delay** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**igp sync delay** *seconds*
**no igp sync delay**

| | |
|---|---|
| **Syntax Description** | *seconds* Time, in seconds, that declaration of LDP sync state being up is delayed after session establishment upon link coming up. Range is 5 to 300. |

**Command Default**  LDP does not delay declaration of sync up and notifies IGP as soon as sync up conditions are met for a link.

**Command Modes**  MPLS LDP configuration

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**
- By default, LDP declares LDP sync up as soon as all the requisite conditions are met, namely:

  - LDP session is up.
  - LDP has sent all its label bindings to at least one peer.
  - LDP has received at least one label binding from a peer.

  This minimizes traffic loss on link up but can still lead to substantial traffic loss under certain circumstances (for example, when interoperating with an LSR with ordered mode operation). It may be necessary to delay declaration of sync up after the session comes up by configuring a timeout period.

- When the graceful-restart event is configured, the IGP sync delay timer does not take effect.

**Task ID**

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

**Examples**

The following example shows how to configure LDP to delay declaration of sync-up to 30 seconds:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# mpls ldp
RP/0/RP0/CPU0:router(config-ldp)# igp sync delay 30
```

# igp sync delay on-proc-restart

To delay the declaration of synchronization events to the Interior Gateway Protocol (IGP) when the label distribution protocol (LDP) fails or restarts, use the **igp sync delay on-proc restart** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**igp sync delay on-proc restart** *seconds*
**no igp sync delay on-proc restart** *seconds*

| **Syntax Description** | *seconds* | Time, in seconds, duration of process-level delay for synchronization events when the LDP fails or restarts. Range is from 60 to 600. |
|---|---|---|

**Command Default**     This command is disabled by default.

**Command Modes**       MPLS LDP configuration

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**    The **igp sync delay on-proc restart** command enables a process-level delay for synchronization events when the LDP fails or restarts. This delay defers the sending of sync-up events to the IGP until most or all the LDP sessions converge and also allows the LDP to stabilize. This allows the LDP process failure to be less stressful because IGPs receive all the sync-up events in bulk. This means that the IGP is required to run the shortest path first (SPF) and link-state advertisements (LSAs) only one time with an overall view of the sync-up events.

**Task ID**

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

**Examples**            The following example shows how to configure LDP to delay the declaration of synchronization events to IGP by 60 seconds:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# mpls ldp
RP/0/RP0/CPU0:router(config-ldp)# igp sync delay on-proc restart 60
```

The following example shows the status following execution of the command:

```
RP/0/RP0/CPU0:router# show mpls ldp igp sync

  Process Restart Sync Delay: 60 sec, Gloal timer running (15 sec remaining)
  GigabitEthernet0/3/0/2:
  Sync status: Deferred
  ….
```

When the timer is not running, the output displays the following:

```
Process Restart Sync Delay: 60 sec, Global timer not running
```

# implicit-null-override

To configure a router to advertise implicit null labels to a set of prefixes, for which a non-null label is to be advertised by default, use the **implicit-null-override** command in MPLS LDP label configuration mode. To return to the default behavior, use the **no** form of this command.

[**vrf** *vrf-name*] **address-family** {**ipv4** | **ipv6**} **label local implicit-null-override** {**for** *prefix-acl*}
**no** [**vrf** *vrf-name*] **address-family** {**ipv4** | **ipv6**} **label local implicit-null-override**

**Syntax Description**

| | |
|---|---|
| **vrf** *vrf-name* | (Optional) Specifies the VRF name. |
| **address-family ipv4** | Specifies IP version 4 address family. |
| **ipv6** | Specifies IP version 6 address family. |
| **label** | Configure label control and policies. |
| **local** | Configure local label control and policies. |
| **for** *prefix-acl* | Specifies the usage of implicit-null label to a set of prefixes. Range is 1 to 99. |
| | **Note** This command works with any prefix including static, IGP, and BGP, when specified in the ACL. |

**Command Default**   Implicit null is advertised as default null label for routes, such as directly connected routes, whereas a non-null label is advertised for IGP, BGP, and static prefixes.

**Command Modes**   MPLS LDP label configuration

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

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

**Task ID**

| Task ID | Operation |
|---|---|
| mpls-ldp | read, write |

The following command shows how to advertise implicit-null label to a specific LDP peer:

```
RP/0/RP0/CPU0:router(config-ldp-af-lbl-lcl)# implicit-null-override for 80
```

# interface (MPLS LDP)

To configure or enable Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) on an interface, use the **interface** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**interface** *type interface-path-id*
**no interface** *type interface-path-id*

**Syntax Description**

| | |
|---|---|
| *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. |

**Command Default**    No default behavior or values

**Command Modes**    MPLS LDP configuration

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**    When you configure LDP on an interface, the LDP process begins neighbor discovery, sending link hello messages on the interface. This can result in a session setup with discovered neighbors. When LDP is enabled on tunnel-te interfaces, targeted discovery procedures apply.

LDP interface configuration supports forward reference; accordingly, it is possible to configure a nonexisting interface under LDP.

**Note**    You cannot enable LDP on loopback interfaces.

MPLS LDP is supported over Generic Route Encapsulation (GRE) tunnels by configuring the tunnel-ip interface. LDP establishes a link session (as opposed to a targeted LDP session) over the GRE tunnel.

**Task ID**

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

**Examples**

The following example shows how to configure LDP on POS interface 0/1/0/0:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# mpls ldp
RP/0/RP0/CPU0:router(config-ldp)# interface POS 0/1/0/0
RP/0/RP0/CPU0:router(config-ldp-if)#
```

The following example shows how to configure LDP on an MPLS TE tunnel:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# mpls ldp
RP/0/RP0/CPU0:router(config-ldp)# interface tunnel-te 123
RP/0/RP0/CPU0:router(config-ldp-if)#
```

The following example shows how to configure MPLS LDP over GRE tunnels:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# mpls ldp
RP/0/RP0/CPU0:router(config-ldp)# interface tunnel-ip 1
RP/0/RP0/CPU0:router(config-ldp-if)#
```

This example shows how to configure MPLS LDP over BVI interfaces:

```
RP/0/RP0/CPU0:router#configure
RP/0/RP0/CPU0:router(config)#mpls ldp
RP/0/RP0/CPU0:router(config-ldp)#interface BVI 65535
RP/0/RP0/CPU0:router(config-ldp-if)#
```

# label accept

To control the receipt of labels (remote bindings) for a set of prefixes from a peer, use the **label accept** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**label accept for** *prefix-acl* **from** *ip-address*
**no label accept for** *prefix-acl* **from** *ip-address*

| Syntax Description | **for** *prefix-acl* | Accepts and retains remote bindings for prefixes that are permitted by the prefix access list *prefix-acl* argument. |
| --- | --- | --- |
| | **from** *ip-address* | Displays the peer IP address. |

**Command Default**  LDP accepts and retains label bindings for all prefixes from all peers.

**Command Modes**  MPLS LDP configuration

| Command History | **Release** | **Modification** |
| --- | --- | --- |
| | Release 7.0.12 | This command was introduced. |

**Usage Guidelines**  By default, LDP accepts labels (as remote bindings) for all prefixes from all its peers. To save resources (such as memory) configure the access list to specify label and binding acceptance for a set of prefixes from a peer.

If the inbound label filtering policy changes such that it now allows previously denied prefixes from a peer, you must reset the LDP session with the peer using the **clear mpls ldp neighbor** command.

LDP supports IPv4 standard access lists only.

> **Note**  Label acceptance control is also referred to as LDP inbound label filtering.

| Task ID | **Task ID** | **Operations** |
| --- | --- | --- |
| | mpls-ldp | read, write |

**Examples**  The following example shows how to configure inbound label filtering policy. In this example, an LSR is configured to accept and retain label bindings for prefixes 192.168.1.1 (pfx_acl_1) from peer 10.0.0.1, prefix 192.168.2.2 (pfx_acl_2) from peer 172.16.0.1, and prefixes 192.168.1.1, 192.168.2.2, 192.168.3.3 (pfx_acl_3) from peer 209.165.201.1:

```
RP/0/RP0/CPU0:router(config-ldp)# label accept
RP/0/RP0/CPU0:router(config-ldp-lbl-acpt)# for pfx_acl_1 from 10.0.0.1
RP/0/RP0/CPU0:router(config-ldp-lbl-acpt)# for pfx_acl_2 from 172.16.0.1
```

```
RP/0/RP0/CPU0:router(config-ldp-lbl-acpt)# for pfx_acl_3 from 209.165.201.1
```

# label advertise

To control the advertisement of local labels, use the **label advertise** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**label advertise**  [**disable** | **for**  *prefix-acl*  [**to**  *peer-acl*] | **interface**  *type  interface-path-id*]
**no  label advertise**  [**disable** | **for**  *prefix-acl*  [**to**  *peer-acl*] | **interface**  *type  interface-path-id*]

| Syntax Description | | |
|---|---|---|
| **disable** | (Optional) Disables label advertisement to all peers for all prefixes. | |
| **for**  *prefix-acl* | (Optional) Specifies prefix destinations for which labels will be advertised. | |
| **to**  *peer-acl* | (Optional) Specifies which LDP neighbors will receive label advertisements. | |
| **interface** | (Optional) Specifies an interface for label allocation and advertisement of its interface IP address. | |
| *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. | |

**Command Default**  LDP advertises labels for all known prefixes to all peers. LDP does not advertise labels for local interfaces addresses other than Loopback interfaces.

**Command Modes**  MPLS LDP configuration

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**  The **label advertise**  command determines how the label switch router (LSR) advertises local labels. The following rules describe the effects of running multiple commands:

- Every command has a prefix-acl or peer-acl pair associated with it, as follows:

    - In the absence of the **for** or **to**  keywords, the access list pair is (none, none).

    - When using the **for** keyword without the **to** keyword, the access list is (prefix-acl, none).

- A prefix can have a maximum of one (prefix-acl, peer-acl) pair, as follows:

    - A (prefix-acl, peer-acl) pair applies to a prefix only if the prefix-acl matches the prefix. A match occurs if the prefix-acl permits the prefix.

    - If more than one (prefix-acl, peer-acl) pair from multiple **label advertise** commands matches a prefix, the (prefix-acl, peer-acl) pair in the first command applies to the prefix. The order in which

the **label advertise** commands are processed is sorted based on the ACL names in a MIB-lexicographical way (shorter ACL name length is processed first, if two ACLs are of equal length, then dictionary ordering is used).

- When an LSR is ready to advertise a label for a prefix, the LSR determines whether a (prefix-acl, peer-acl) pair applies to the prefix.

  - If none applies, and if the **disable** keyword has been configured for the command, the label for the prefix is not advertised to any peer; otherwise, the label is advertised to all peers.

  - If a (prefix-acl, peer-acl) pair applies to the prefix, and if the prefix-acl denies the prefix, the label is not advertised to any peer.

  - If (prefix-acl, peer-acl) pair applies to the prefix and if the prefix-acl denies the prefix, the label is not advertised to peers defined in the peer-acl. Nevertheless, the prefix may be matched in subsequent (prefix-acl, peer-acl) entries and advertised to other peers.

  - If the prefix-acl permits the prefix and there is a peer-acl, the label is advertised to all peers permitted by the peer-acl.

Normally, LDP advertises labels for non-BGP routes present in the routing table. Additionally, LDP advertises labels from /32 IP addresses on Loopback interfaces and does not advertise /32 addresses for other non-Loopback interfaces. To control advertisement of labels for /32 IP addresses on these interfaces, use the **label advertise interface** command.

LDP supports IPv4 standard access lists only.

> **Note** Label advertisement control is also referred to as LDP outbound label filtering.

**Task ID**

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

**Examples**

The following example shows how to disable advertisement of all locally assigned labels to all peers:

```
RP/0/RP0/CPU0:router(config-ldp)# label advertise
RP/0/RP0/CPU0:router(config-ldp-lbl-advt)# disable
```

The following example shows how to send labels only for prefixes 10.1.1.0 and 20.1.1.0 to all peers:

```
RP/0/RP0/CPU0:router(config)# ipv4 access-list pfx_acl_1
RP/0/RP0/CPU0:router(config-ipv4-acl)# permit 10.1.1.0
RP/0/RP0/CPU0:router(config-ipv4-acl)# permit 20.1.1.0

RP/0/RP0/CPU0:router(config-ldp)# label advertise
RP/0/RP0/CPU0:router(config-ldp-lbl-advt)# disable
RP/0/RP0/CPU0:router(config-ldp-lbl-advt)# for pfx_acl_1
```

The following example shows how to send labels for prefix 10.0.0.0 to peers 10.1.1.1 and 10.2.2.2, labels for prefix 20.0.0.0 to peer 20.1.1.1, and labels for all other prefixes to all other peers:

```
RP/0/RP0/CPU0:router(config)# ipv4 access-list pfx_acl_10
RP/0/RP0/CPU0:router(config-ipv4-acl)# permit 10.0.0.0

RP/0/RP0/CPU0:router(config)# ipv4 access-list pfx_acl_20
RP/0/RP0/CPU0:router(config-ipv4-acl)# permit 20.0.0.0

RP/0/RP0/CPU0:router(config)# ipv4 access-list peer_acl_10
RP/0/RP0/CPU0:router(config-ipv4-acl)# permit 10.1.1.1
RP/0/RP0/CPU0:router(config-ipv4-acl)# permit 10.2.2.2

RP/0/RP0/CPU0:router(config)# ipv4 access-list peer_acl_20
RP/0/RP0/CPU0:router(config-ipv4-acl)# permit 20.1.1.1

RP/0/RP0/CPU0:router(config-ldp)# label advertise
RP/0/RP0/CPU0:router(config-ldp-lbl-advt)# for pfx_acl_10 to peer_acl_10
RP/0/RP0/CPU0:router(config-ldp-lbl-advt)# for pfx_acl_20 to peer_acl_20
```

**Note**     To advertise pfx_acl_10 to peer_acl_10 and pfx_acl_20 to peer_acl_20 and disable all other advertisements to all other peers, include the **disable** keyword with the **label advertise** command.

The following example shows how to use the **interface** keyword to advertise /32 IP address for HundredGigE 0/0/0/1:

```
RP/0/RP0/CPU0:router(config-ldp)# label advertise
RP/0/RP0/CPU0:router(config-ldp-lbl-advt)# interface POS 0/1/0/0
```

# label allocate

To control allocation of local label only for a set of prefixes, use the **label allocate** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**label allocate  for**  {*prefix-acl* | **host-routes**}
**no  label allocate**

| Syntax Description | | |
|---|---|---|
| **for** | Specifies set of prefixes for which local label needs to be allocated. | |
| *prefix-acl* | IP access-list name or number. Range is from 1 to 99. | |
| **host-routes** | Allocates the label for host routes only. | |

**Command Default**  LDP allocates local label for all learned routes (prefixes).

**Command Modes**  MPLS LDP configuration

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**  Local label allocation control lets you override the default label allocation policy and provides many benefits, including reduced memory usage and fewer forwarding and network updates.

By default, LDP allocates local labels for all learned routes. There are times when you may want to limit label allocation for a given set of prefixes; for example, when using LDP in the core network to provide MPLS transport from one edge to another edge. In such cases, it is necessary to set up label switch packets (LSPs) for Loopback /32 addresses for provider edge (PE) routers (rendering it unnecessary to allocate and advertise local labels for other Interior Gateway Protocol (IGP) prefixes).

LDP supports IPv4 standard access lists only.

**Task ID**

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

**Examples**  The following example shows how to configure LDP to limit allocation of local labels to prefixes 192.168.1.1, 192.168.2.2, and 192.168.3.3 only:

```
RP/0/RP0/CPU0:router(config)# ipv4 access-list pfx_acl_1
RP/0/RP0/CPU0:router(config-ipv4-acl)# permit 192.168.1.1
RP/0/RP0/CPU0:router(config-ipv4-acl)# permit 192.168.2.2
RP/0/RP0/CPU0:router(config-ipv4-acl)# permit 192.168.3.3

RP/0/RP0/CPU0:router(config-ldp)# label allocate for pfx_acl_1
```

# log graceful-restart

To set up notification describing graceful-restart (GR) session events, use the **log graceful-restart** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**log graceful-restart**
**no log graceful-restart**

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

**Command Default**    No default behavior or values

**Command Modes**    MPLS LDP configuration

**Command History**

| Release | Modification |
| --- | --- |
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**    Use the **log graceful-restart** command to receive a syslog/console message when a graceful restart-related session event occurs, including LDP graceful restart session disconnection, reconnection, and timeout.

> **Note**    A logging message is issued upon graceful restart session events.

**Task ID**

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

**Examples**    The following example shows how to enable logging messages for graceful restart session events:

```
RP/0/RP0/CPU0:router(config-ldp)# log graceful-restart
```

The following sample output shows the logging events that can be displayed on the console:

```
RP/0/RP0/CPU0:router: mpls_ldp[340]: %ROUTING-LDP-5-GR : GR session 4.4.4.4:0 (instance 1)
 disconnected

RP/0/RP0/CPU0:router: mpls_ldp[340]: %ROUTING-LDP-5-GR : GR session 4.4.4.4:0 (instance 2)
 reconnected

RP/0/RP0/CPU0:router: mpls_ldp[340]: %ROUTING-LDP-5-GR : GR session 5.5.5.5:0 (instance 3)
 timed out

RP/0/RP0/CPU0:router: mpls_ldp[336]: %ROUTING-LDP-5-GR_RESTART_COMPLETE : GR forwarding
state hold timer has expired
```

# log neighbor

To enable logging of notices describing session changes, use the **log neighbor** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**log neighbor**
**no log neighbor**

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

**Command Default**     No default behavior or values

**Command Modes**     MPLS LDP configuration

**Command History**

| Release | Modification |
| --- | --- |
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**     Use the **log neighbor** command to receive a syslog or console message when a neighbor goes up or down.

**Task ID**

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

**Examples**     The following example shows how to enable logging messages for neighbor session up and down events:

```
RP/0/RP0/CPU0:router(config-ldp)# log neighbor
```

**Note**     A logging message is issued when an LDP session state changes from up to down (and down to up).

The following shows sample output of logging events that can be displayed on the console:

```
RP/0/RP0/CPU0:router:10 21:11:32.111:mpls_ldp[113]:%LDP-5-NBR_CHANGE: Nbr 10.44.44.44:0,
DOWN
```

# log nsr

To enable logging of nonstop routing (NSR) synchronization events, use the **log nsr** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**log nsr**
**no log nsr**

| | |
|---|---|
| **Syntax Description** | This command has no arguments or keywords. |
| **Command Default** | No default behavior or values |
| **Command Modes** | MPLS LDP configuration |

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

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

**Task ID**

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

**Examples** The following example shows how to enable logging of NSR synchronization events:

```
RP/0/RP0/CPU0:router(config-ldp)# log nsr
```

# log session-protection

To enable logging of notices describing LDP session protection events, use the **log session-protection** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**log session-protection**
**no log session-protection**

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

**Command Default**    No default behavior or values

**Command Modes**    MPLS LDP configuration

**Command History**

| Release | Modification |
|---------|--------------|
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**    Use the **log session-protection** command to receive a syslog or console message when LDP session protection event occurs. These events include LDP session protection initiation, recovery, and timeout.

**Task ID**

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

**Examples**    The following example shows how to enable logging messages for session protection events:

```
RP/0/RP0/CPU0:router(config-ldp)# log session-protection
```

✎

**Note**    Logging messages are issued when session protection events occur.

The following sample output shows the logging events that are displayed on the console:

```
RP/0/RP0/CPU0:router:Apr 21 12:15:01.742: mpls_ldp[315]:%ROUTING-LDP-5-SESSION_PROTECTION:
 Session hold up initiated for peer 4.4.4.4:0

RP/0/RP0/CPU0:router:Apr 21 12:18:04.987: mpls_ldp[315]:%ROUTING-LDP-5-SESSION_PROTECTION:
 Session recovery succeeded for peer 4.4.4.4:0
```

# make-before-break

To enable Multicast Label Distribution Protocol (MLDP) make-before-break (MBB) support, use **make-before-break** command in MPLS LDP MLDP configuration.

**address-family  ipv4  make-before-break**
[**delay**  *seconds* | **route-policy**  *name*]

**Syntax Description**

| | |
|---|---|
| **delay** *seconds* | (Optional) Specifies the MBB forwarding delay in seconds. Range is 0 to 600. |
| **route-policy** *name* | (Optional) Specifies the route policy name. |

**Command Default**  No default behavior or values

**Command Modes**  MPLS LDP MLDP configuration

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

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

**Task ID**

| Task ID | Operation |
|---|---|
| mpls-ldp | read, write |

**Example**

The following example shows how to enable MLDP MBB support:

```
RP/0/RP0/CPU0:router(config-ldp-mldp)# address-family ipv4 make-before-break
```

# mpls ldp

To enter MPLS Label Distribution Protocol (LDP) configuration mode, use the **mpls ldp** command in

XR Config mode

mode.

**mpls ldp**

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

**Command Default**

No default behavior or values

**Command Modes**

XR Config mode

**Command History**

| Release | Modification |
| --- | --- |
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**

No specific guidelines impact the use of this command.

**Task ID**

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

**Examples**

The following example shows how to MPLS LDP configuration mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# mpls ldp
RP/0/RP0/CPU0:router(config-ldp)
```

# mpls ldp address-family ipv4 traffic-eng tunnels

To auto-enable the LDP tunnels over IPv4 TE, use the **mpls ldp address-family ipv4 traffic-eng tunnels** command in XR Config mode. To undo the configuration, use the **no** form of this command.

**mpls ldp address-family ipv4 traffic-eng tunnels** { **all** | **named** | **numbered** | **regular-expression** }

**Syntax Description**

| | |
|---|---|
| **all** | Auto-enables all LDP on all TE tunnels. |
| **named** | Auto-enables the LDP on all named TE tunnels. |
| **numbered** | Auto-enables the LDP on all numbered TE tunnels. |
| **regular-expression** | Auto-enables the LDP on all TE tunnels whose name or number matches with the given regular expression. |

**Command Default**    None

**Command Modes**    XR Config mode

**Command History**

| Release | Modification |
|---|---|
| Release 7.11.1 | This command was introduced. |

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

**Task ID**

| Task ID | Operation |
|---|---|
| mpls-ldp | read, write |

This example shows the auto enabling of all the configured LDP tunnels over TE.

```
Router#
Router(config)# mpls ldp address-family ipv4 traffic-eng tunnels all
Router(config)# commit
Router(config)# end
```

# neighbor dual-stack tlv-compliance

To configure dual-stack TLV compliance check, use the **neighbor dual-stack tlv-compliance** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**neighbor dual-stack tlv-compliance**
**no   neighbor dual-stack tlv-compliance**

| | |
|---|---|
| **Syntax Description** | This command has no arguments or keywords. |
| **Command Default** | Compliance check is disabled by default. |
| **Command Modes** | MPLS LDP configuration |

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

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

**Task ID**

| Task ID | Operation |
|---|---|
| mpls-ldp | read, write |

### Example

The following example shows how to configure dual-stack TLV compliance check:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# mpls ldp
RP/0/RP0/CPU0:router(config-ldp)# neighbor dual-stack tlv-compliance
```

# neighbor dual-stack transport-connection max-wait

To configure the maximum time (in seconds) the preferred address family connection must wait to establish before resorting to non-preferred address family or FCFS, use the **neighbor dual-stack transport-connection max-wait** command in MPLS LDP configuration mode.

**neighbor dual-stack transport-connection max-wait** *seconds*

**Syntax Description**

| | |
|---|---|
| *seconds* | Specifies the maximum wait time in seconds for preferred transport connection establishment. The range is from 0 to 60. Zero indicates no preference. |

**Command Default**      No default behavior or values

**Command Modes**      MPLS LDP configuration

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

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

**Task ID**

| Task ID | Operation |
|---|---|
| mpls ldp | read, write |

**Example**

The following example shows how to configure the maximum wait time for preferred transport connection establishment:

```
RP/0/0/CPU0:ios#configure
RP/0/0/CPU0:ios(config)#mpls ldp
RP/0/0/CPU0:ios(config-ldp)#neighbor dual-stack transport-connection max-wait 5
```

# neighbor dual-stack transport-connection prefer ipv4 for-peers

To configure preferred transport as IPv4 for set of peers to establish TCP connection in a dual-stack setup, use the **neighbor dual-stack transport-connection prefer ipv4 for-peers** command in the MPLS LDP configuration mode.

**neighbor dual-stack transport-connection prefer ipv4 for-peers** *access-list*

| | |
|---|---|
| **Syntax Description** | *access-list*   IPv4 access-list (specifies peer LSR IDs in A.B.C.D format). |

**Command Default**   No default behavior or values

**Command Modes**   MPLS LDP configuration

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

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

**Task ID**

| Task ID | Operation |
|---|---|
| mpls ldp | read, write |

### Example

The following example shows how to configure preferred transport as IPv4 for set of peers:

```
RP/0/0/CPU0:ios#configure
RP/0/0/CPU0:ios(config)#mpls ldp
RP/0/0/CPU0:ios(config-ldp)#neighbor dual-stack transport-connection prefer ipv4 for-peers
 192.168.0.1
```

# neighbor password

To configure password authentication using the TCP Message Digest 5 (MD5) option for a neighbor, use the **neighbor password** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

[**vrf** *vrf-name*] **neighbor** *ldp-id* **password** {**clear** | **disable** | **encrypted** *password* }
**no** [**vrf** *vrf-name*] **neighbor** *ldp-id* **password**

**Syntax Description**

| | |
|---|---|
| **vrf** *vrf-name* | (Optional) Specifies the VRF name. |
| *ldp-id* | LDP ID of neighbor in A.B.C.D:0 format. |
| **clear** | Clears the password for the encyrption parameter to specify that an unencrypted password will follow. |
| **disable** | Disables the global password from the specified neighbor. |
| **encrypted** | Specifies that an encrypted password will follow. |
| *password* | (Clear text) Encrypted or unencrypted password string. |

**Command Default** LDP sessions are negotiated without any password (and MD5).

**Command Modes** MPLS LDP configuration

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines** This security feature is enabled per neighbor, so that a session establishment attempt is allowed only when a password match has been configured. This option must be configured so that both peer passwords match.

To override the default password for a specific neighbor, use the **neighbor** *ldp-id* **password** command, where the *ldp-id* argument is the LDP ID of the neighbor.

**Note** The global default password must be configured before being able to override the default password for a specific neighbor.

**Task ID**

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

**Examples**

The following example shows how to configure the password *abc* for neighbor 10.20.20.20 and how to clear it:

```
RP/0/RP0/CPU0:router(config-ldp)# neighbor 10.20.20.20:0 password clear abc
```

# neighbor password disable

To override an individual neighbor which requires no password, use the **neighbor password disable** command in MPLS LDP configuration mode.

**neighbor** *IP-address* **password disable**

**Syntax Description**

| | |
|---|---|
| *IP-address* | Neighbor IP address. |

**Command Default**

LDP sessions are negotiated without any password (and MD5).

**Command Modes**

MPLS LDP configuration

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**

The system uses the global password to compute each neighbor's effective password and overrides the global password with the individual neighbor password, if configured. The session remains stable if you shift from an individual neighbor password to an equal global password. However, if the effective password changes during configuration, the session might be rendered unstable.

> **Note** You must configure the password for an individual neighbor using the neighbor's LSR ID.

**Task ID**

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

**Examples**

The following example shows how to override the individual password *abc*, for the neighbor:

```
RP/0/RP0/CPU0:router(config-ldp)# neighbor 10.20.20.20 password disable abc
RP/0/RP0/CPU0:router(config-ldp)#
```

# neighbor targeted

To configure transmission of targeted hellos toward a neighbor for setting up an LDP session, use the **neighbor targeted** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**address-family**   {**ipv4** | **ipv6**} **neighbor** *Ip-address* **targeted**
**no address-family**   {**ipv4** | **ipv6**} **neighbor** *ip-address* **targeted**

| **Syntax Description** | *ip-address* | Neighbor IP address. |
|---|---|---|
| | **ipv4** | Specifies IP version 4 address family. |
| | **ipv6** | Specifies IP version 6 address family. |

**Command Default**    No default behavior or values

**Command Modes**    MPLS LDP configuration

| **Command History** | **Release** | **Modification** |
|---|---|---|
| | Release 7.0.12 | This command was introduced. |

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

| **Task ID** | **Task ID** | **Operations** |
|---|---|---|
| | mpls-ldp | read, write |

**Examples**    The following example shows how to set up a targeted discovery session for neighbor 200.1.1.1:

```
RP/0//CPU0:router(config-ldp)# neighbor 200.1.1.1 targeted
```

# nsr (MPLS-LDP)

To configure nonstop routing for LDP protocols in the event of a disruption in service, use the **nsr** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**nsr**
**no nsr**

| | |
|---|---|
| **Syntax Description** | This command has no arguments or keywords. |
| **Command Default** | By default, MPLS LDP NSR is disabled. |
| **Command Modes** | MPLS LDP configuration |

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**  A disruption in service may include any of the following events:

- Route Switch Processor (RSP) switchover
- Route processor (RP) or distributed route processor (DRP) failover
- LDP process restart
- In-service system upgrade (ISSU)
- Minimum disruption restart (MDR)

Enabling NSR causes events such as these to be invisible to the routing peers and provide minimal service disruption.

> **Note**  The LDP Process restart is supported by NSR only if the NSR process-failures switchover is configured, else the process restart causes the session to be unstable.

**Task ID**

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

**Examples**  The following example shows how to enable MPLS LDP NSR:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# mpls ldp
RP/0/RP0/CPU0:router(config-ldp)# nsr
```

# recursive-fec

To enable Multicast Label Distribution Protocol (MLDP) recursive-fec support, use **recursive-fec** command in MPLS LDP MLDP configuration.

**address-family  ipv4  recursive-fec**  [**route-policy**  *name*]

| | |
|---|---|
| **Syntax Description** | **route-policy** *name*  (Optional) Specifies the route policy name. |

**Command Default**  No default behavior or values

**Command Modes**  MPLS LDP MLDP configuration

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

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

**Task ID**

| Task ID | Operation |
|---|---|
| mpls-ldp | read |

### Example

The following example shows how to enable MLDP recursive fec support:

```
RP/0/RP0/CPU0:router(config-ldp-mldp)# address-family ipv4 recursive-fec
```

# redistribute (MPLS LDP)

To redistribute routes from a Border Gateway Protocol (BGP) autonomous system into an MPLS LDP, use the **redistribute** command in MPLS LDP configuration mode. To disable route redistribution, use the **no** form of this command.

**redistribute** **bgp** {**as** *as-number* | **advertise-to** *access-list-name*}
**no redistribute** **bgp** {**as** *as-number* | **advertise-to** *access-list-name*}

**Syntax Description**

| | |
|---|---|
| **bgp** | Redistributes information from BGP protocols. |
| **as** *as-number* | Specifies the BGP autonomous system number. |
| **advertise-to** *access-list* | Advertise the redistributed route information. |

**Command Default**

No default behavior or values

**Command Modes**

MPLS LDP configuration

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**

No specific guidelines impact the use of this command.

**Task ID**

| Task ID | Operation |
|---|---|
| MPLS LDP | read, write |

The following example shows how to redistribute BGP information to MPLS LDP peers:

```
RP/0/RP0/CPU0:router(config)# mpls ldp
RP/0/RP0/CPU0:router(config-ldp)# redistribute bgp ?
  advertise-to  IP access list specifying LDP peers to advertise
  as            BGP AS-number
  <cr>
RP/0/RP0/CPU0:router(config-ldp)# redistribute bgp as 10000
RP/0/RP0/CPU0:router(config-ldp)# commit

RP/0/RP0/CPU0:router# show run mpls ldp | b bgp
 bgp
   as 10000
   !
```

# router-id (MPLS LDP)

To specify an IPv4 address to act as the router ID, use the **router-id** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

[**vrf** *vrf-name*]
**router-id** *lsr-id*
**no** [**vrf** *vrf-name*] **router-id**

| **Syntax Description** | **vrf** *vrf-name* | (Optional) Specifies the VRF name. |
| --- | --- | --- |
| | *lsr-id* | LSR ID in A.B.C.D format. |

**Command Default**    LDP uses router ID as determined by global router ID agent, IP Address Repository Manager (IP ARM).

**Command Modes**    MPLS LDP configuration

**Command History**

| **Release** | **Modification** |
| --- | --- |
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**    LDP uses the router ID from different sources in the following order:

1. Configured LDP router ID.
2. Global router ID (if configured).
3. Calculated (computed) using the primary IPv4 address of the highest numbered configured loopback address. We recommend configuring at least one loopback address.

✎

**Note**    We recommend that you configure an IP address for the LDP router-id to avoid unnecessary session flaps.

**Task ID**

| **Task ID** | **Operations** |
| --- | --- |
| mpls-ldp | read, write |

**Examples**    The following example shows how to specify an LSR ID as the router ID:

```
RP/0/RP0/CPU0:router(config-ldp)#router-id 10.0.0.1
```

# router ospf

To enable Open Shortest Path First (OSPF) LDP IGP synchronization for a specific VRF or a specific VRF area or a specific VRF area interface, use the **router ospf** command in XR Config mode.

**router ospf** *process-id* [**vrf** *vrf-name* [**area** {*area-id ip-address*}] [**interface** *type interface-path-id*] **mpls ldp sync** [**disable**]]

| Syntax Description | | |
|---|---|
| *process-id* | Internally used identification parameter for an OSPF routing process. It is locally assigned and can be any positive integer. A unique value is assigned for each OSPF routing process. |
| **vrf** *vrf-name* | (Optional) Specifies the name of the VRF instance to associate with OSPF VRF processes. |
| **area** | (Optional) Enters the OSPF area configuration submode. |
| *area-id* | Specifies the OSPF area ID as a decimal value. |
| *ip-address* | Specifies the OSPF area ID as an IP address in A.B.C.D format. |
| **interface** | (Optional) Enters the OSPF interface configuration submode. |
| *type* | Interface type. For more information, use the question mark (?) online help function. |
| *interface-path-id* | Physical interface or a virtual interface.<br><br>**Note** Use the **show interfaces** command to see a list of all possible interfaces currently configured on the router.<br><br>For more information about the syntax for the router, use the question mark (?) online help function. |
| **sync** | Enables LDP IGP synchronization on the specified interface. |

| | |
|---|---|
| **disable** | (Optional) Disables MPLS LDP synchronization. |

**Command Default**

No default behavior or values

**Command Modes**

XR Config mode

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**

No specific guidelines impact the use of this command.

**Task ID**

| Task ID | Operation |
|---|---|
| mpls-ldp | read, write |

**Example**

The following example shows how to enable OSPF LDP IGP synchronization for a specific VRF:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)#router ospf 109
RP/0/RP0/CPU0:router(config-ospf)#
```

# session protection

To enable the LDP session protection feature for keeping LDP peer session up by means of targeted discovery following the loss of link discovery with a peer, use the **session protection** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**session protection** [**duration** *seconds* | **infinite**] [**for** *peer-acl*]
**no session protection**

**Syntax Description**

| | |
|---|---|
| **duration** *seconds* | (Optional) Specifies the protection duration, that is, the number of seconds that targeted discovery should continue following the loss of link discovery to a neighbor. Range is 30 to 2147483. |
| **infinite** | (Optional) Specifies session protection to last forever after loss of link discovery. |
| **for** *peer-acl* | (Optional) Specifies set of LDP peers for which session protection is to be enabled. |

**Command Default**

By default, session protection is disabled. When enabled without peer-acl and duration, session protection is provided for all LDP peers and continues for 24 hours after a link discovery loss.

**Command Modes**

MPLS LDP configuration

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**

LDP session protection feature allows you to enable the automatic setup of targeted hello adjacencies with all or a set of peers and specify the duration for which session needs to be maintained using targeted hellos after loss of link discovery.

LDP supports only IPv4 standard access lists.

**Task ID**

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

**Examples**

The following example shows how to enable session protection for all discovered peers with unlimited duration to maintain the session after link discovery loss:

```
RP/0/RP0/CPU0:router(config-ldp)# session protection
```

The following example shows how to enable session protection for a set of peers (as permitted by a peer ACL) with duration of 30 seconds to maintain the session after link discovery loss:

```
RP/0/RP0/CPU0:router(config-ldp)# session protection for peer_acl duration 30
```

# show lcc

To display label consistency checker (LCC) information, use the **show lcc** command in XR EXEC mode mode.

**show lcc** {**ipv4** | **ipv6**} **unicast** {**all** | **label** | **tunnel-interface** | **statistics** | [**summary** | **scan-id** *scan-id*]} [**vrf** *vrfname*]

| Syntax Description | | |
|---|---|---|
| | **ipv4** | Specifies IP version 4 address prefixes. |
| | **ipv6** | Specifies IP version 6 address prefixes. |
| | **unicast** | Specifies unicast address prefixes. |
| | **all** | Scans all routes. |
| | **label** | Scans all labels. |
| | **tunnel-interface** | Specifies the interface of a tunnel. |
| | **statistics** | Displays route consistency check statistics information. |
| | **scan-id** | Specifies the value of scan-id. Range is from 0 to 100000. |
| | **summary** | Displays background route consistency check statistics summary information. |
| | **vrf** *vrfname* | (Optional) Specifies a particular VPN routing and forwarding (VRF) instance or all VRF instances. |

| **Command Default** | None |
|---|---|

| **Command Modes** | IPv4 address family configuration |
|---|---|
| | IPv6 address family configuration |

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

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

**Task ID**

| Task ID | Operations |
|---|---|
| IPv4 | read |
| IPv6 | read |

**Examples**

The following example shows an outcome of the label consistency checker information:

```
RP/0/RP0/CPU0:router# show lcc ipv4 unicast all

Sending scan initiation request to IPv4 LSD ... done
Waiting for scan to complete (max time 600 seconds)......................
Scan Completed
Collecting scan results from FIBs (max time 30 seconds)... done
Number of nodes involved in the scan: 2
Number of nodes replying to the scan: 2

Legend:
        ? - Currently Inactive Node, ! - Non-standard SVD Role
        * - Node did not reply

    Node                Checks Performed              Errors

    0/2/CPU0                 6                             0
    0/0/CPU0                 6                             0
```

# show mpls ldp backoff

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

**show mpls ldp** [**vrf** *vrf-name*] **backoff** [**location** *node-id* | **standby**]

| Syntax Description | **vrf** *vrf-name* | (Optional) Displays the VRF information for the specified VRF. |
| --- | --- | --- |
| | **location** *node-id* | (Optional) Displays location information for the specified node ID. |
| | **standby** | (Optional) Displays standby-node-specific information. |

**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**  You must enable the MPLS LDP application to use the **show mpls ldp backoff** command.

| Task ID | **Task ID** | **Operations** |
| --- | --- | --- |
| | mpls-ldp | read |

**Examples**  The following shows a sample output from the **show mpls ldp backoff** command:

```
RP/0/RP0/CPU0:router# show mpls ldp backoff

Backoff Time:
  Initial:15 sec, Maximum:120 sec

Backoff Table: (2 entries)

  LDP Id             Backoff (sec)  Waiting (sec)
  ------------------ -------------- ----------------
  33.33.33.33:0         15              15
  11.11.11.11:0         30              30
```

This table describes the significant fields shown in the display.

*Table 1: show mpls ldp backoff Command Field Descriptions*

| Field | Description |
| --- | --- |
| Backoff Time | Initial and maximum backoff time parameters, in seconds. |

| Field | Description |
|---|---|
| Backoff Table | List of discovered LDP neighbors for which session setup is being delayed because of previous failures to establish a session due to incompatible configuration. The backoff table incorporates the following information: **LDP Id** Identifies the LDP neighbors. **Backoff (sec)** Specifies the time that the session setup is delayed. **Waiting (sec)** Specifies an approximate time the session setup has been delayed. |

# show mpls ldp bindings

To display the contents of the Label Information Base (LIB), use the **show mpls ldp bindings** command in XR EXEC mode command.

**show mpls ldp** [**afi-all**] [**vrf all**] [**vrf** *vrf-name*] [**ipv4** | **ipv6**] **bindings** [*prefix/length* ] [**advertisement-acls**] [**brief**] [**detail**] [**local**] [**local-label** *label* [**to** *label*]] [**local-only**] [**neighbor** *address*] [**remote-only**][**remote-label** *label* [**to** *label*]] [**summary**] [**location** *node-id* | **standby**] [**all**]

**Syntax Description**

| | |
|---|---|
| **afi-all** | (Optional) Displays all address families. |
| **vrf all** | (Optional) Displays all LDP configured VRFs. |
| **vrf** *vrf-name* | (Optional) Displays the VRF information for the specified VRF. |
| **ipv4** | (Optional) Specifies IP version 4 address family. |
| **ipv6** | (Optional) Specifies IP version 6 address family. |
| *prefix* | (Optional) Destination prefix, written in A.B.C.D format. |
| *length* | (Optional) Network mask length, in bits. Range is 0 to 32. |
| **advertisement-acls** | (Optional) Displays the label bindings as applied for (advertisement) outbound label filtering ACLs. |
| **brief** | (Optional) Displays all the prefixes in the LDP database. |
| **detail** | (Optional) Displays the total counts of advertised-to and remote-binding peers in IP address sort order, with remote bindings in tabular format. |
| **local** | (Optional) Displays the local label bindings. |
| **local-label** *label* [**to** *label*] | (Optional) Displays entries matching local label values. Add the *label* **to** *label* argument to indicate the label range. |

| | |
|---|---|
| **local-only** | (Optional) Displays binding matches with a local label only. |
| **neighbor** *address* | (Optional) Displays the label bindings assigned by the selected neighbor. |
| **remote-only** | (Optional) Displays bindings matches with a remote label only. |
| **remote-label** *label* [**to** *label*] | (Optional) Displays entries matching the label values assigned by a neighbor router. Add the *label* **to** *label* argument to indicate the label range. Range is from 0 to 2147483647. |
| **summary** | (Optional) Displays a summary of the contents of the Label Information Base (LIB). |
| **location** *node-id* | (Optional) Displays location information for the specified node ID. |
| **standby** | (Optional) Displays standby-node-specific information. |
| **all** | (Optional) Displays the aggregate summary across LDP processes and all VRFs. |

**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 ldp bindings** command displays local and remote label bindings learned from neighbors for non-BGP routes (such as IGP prefixes and static routes).

You can choose to view the entire database or a subset of entries according to the following criteria:

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

**Note** The **show mpls ldp bindings summary** command displays summarized information from the LIB and is used when testing scalability or when deployed in a large scale network.

**Task ID**

| Task ID | Operations |
|---------|------------|
| mpls-ldp | read |

**Examples**

The following sample output displays the contents of the LIB for the default routing domain:

```
RP/0/RP0/CPU0:router# show mpls ldp bindings

     5.41.0.0/16 , rev 4
         local binding: label:IMP-NULL
         No remote bindings
  5.43.9.98/32 , rev 6
         local binding: label:IMP-NULL
         No remote bindings
 10.10.2.0/24 , rev 12
         local binding: label:IMP-NULL
         remote bindings :
             lsr:10.255.255.255:0, label:16
             lsr:10.256.256.256:0, label:IMP-NULL
 10.10.3.0/24 , rev 10
         local binding: label:IMP-NULL
         remote bindings :
             lsr:10.255.255.255:0, label:IMP-NULL
             lsr:10.256.256.256:0, label:22
 22.22.22.22/32 , rev 14
         local binding: label:16
         remote bindings :
             lsr:10.255.255.255:0, label:17
             lsr:10.256.256.256:0, label:IMP-NULL
 33.33.33.33/32 , rev 2
         local binding: label:IMP-NULL
         remote bindings :
             lsr:10.255.255.255:0, label:18
             lsr:10.256.256.256:0, label:23
```

The following sample output shows detailed information for the total counts of advertised-to and remote-binding peers in IP address sort order, with remote bindings for 150.150.150.150/32:

```
RP/0/RP0/CPU0:router# show mpls ldp bindings 150.150.150.150/32 detail

  150.150.150.150/32, rev 2
      Local binding: label: IMP-NULL
        Advertised to: (6 peers)
          120.120.120.120:0  130.130.130.130:0  150.150.150.1:0  150.150.150.2:0
          150.150.150.3:0    150.150.150.4:0
      Remote bindings:    (3 peers)
          Peer               Label
      -----------------      --------
          120.120.120.120:0    27018
          130.130.130.130:0    26017
          160.160.160.160:0    27274
```

The following sample output specifies a network number and displays labels learned from label switched router (LSR) 10.255.255.255 for all networks. The **neighbor** keyword is used to suppress the output of remote labels learned from other neighbors:

```
RP/0/RP0/CPU0:router# show mpls ldp bindings neighbor 10.255.255.255

  10.10.2.0/24 , rev 12
          local binding: label:IMP-NULL
          remote bindings :
              lsr:10.255.255.255, label:16
  10.10.3.0/24 , rev 10
          local binding: label:IMP-NULL
          remote bindings :
              lsr:10.255.255.255:0, label:IMP-NULL
  22.22.22.22/32 , rev 14
          local binding: label:16
          remote bindings :
              lsr:10.255.255.255:0, label:17
  33.33.33.33/32 , rev 2
          local binding: label:IMP-NULL
          remote bindings :
              lsr:10.255.255.255:0, label:18
  44.44.44.44/32 , rev 16
          local binding: label:17
          remote bindings :
              lsr:10.255.255.255:0, label:IMP-NULL
```

This table describes the significant fields shown in the display.

*Table 2: show mpls ldp bindings and show mpls ldp bindings neighbor Command Field Descriptions*

| Field | Description |
| --- | --- |
| a.b.c.d/n | IP prefix and mask for a particular destination (network/mask). |
| rev | Revision number (rev) that is used internally to manage label distribution for this destination. |
| local binding | Locally assigned label for a prefix. |
| remote bindings | Outgoing labels for this destination learned from other LSRs.[1] Each item in this list identifies the LSR from which the outgoing label was learned and reflects the label associated with that LSR. Each LSR in the transmission path is identified by its LDP identifier. |
| (rewrite) | Binding has been written into MPLS forwarding and is in use. |
| (no route) | Route is not valid. LDP times it out before the local binding is deleted. |

[1] Label switched routers.

The following sample output summarizes the content by using the **summary** keyword:

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

  LIB Summary:
    Total Prefix   : 20
    Revision No    : Current:34, Advertised:34
    Local Bindings : 14
        NULL     : 10 (implicit:10, explicit:0)
        Non-NULL: 4 (lowest:48, highest:51)
    Remote Bindings: 24
```

This table describes the significant fields shown in the display.

*Table 3: show mpls ldp bindings summary Command Field Descriptions*

| Field | Description |
|---|---|
| Total Prefix | Number of prefixes (routes) known to LDP LIB. All invalid and timed-out routes display as no-routes. |
| Revision No | Current revision number of LIB entries as well as the minimum revision number that has been advertised to all peers. |
| Local Bindings | Total number of local bindings, with information on how many of them are Null, non-null, and lowest/highest label assigned or allocated by LDP. |
| Remote Bindings | Number of remote bindings. |

The following sample output shows the access-list advertisement:

```
RP/0/RP0/CPU0:router# show mpls ldp bindings advertisement-acls

  Advertisement Spec:
        Prefix ACL = 'pfx_11'
        Prefix ACL = 'pfx_22'
        Prefix ACL = 'pfx_40_1'; Peer ACL = 'peer_11'

  5.41.0.0/16 , rev 82
  11.11.11.11/32 , rev 69
        Advert ACL(s): Prefix ACL 'pfx_11'
  20.20.20.20/32 , rev 83
  22.22.22.22/32 , rev 78
        Advert ACL(s): Prefix ACL 'pfx_22'
  40.1.1.0/24 , rev 79
        Advert ACL(s): Prefix ACL 'pfx_40_1'; Peer ACL 'peer_11'
```

This table describes the significant fields shown in the display.

*Table 4: show mpls ldp bindings advertisement-acls Command Field Descriptions*

| Field | Description |
|---|---|
| Advertisement Spec | Lists all prefix and peer access-lists used as outbound label advertisement control. |

| Field | Description |
|-------|-------------|
| Advert ACL(s) | Lists the first matching rule (if any) for the prefix entry for outbound label advertisement control (for prefix-acl). |

The following sample output shows all the prefixes in the LDP database using the **brief** keyword:

```
RP/0/RP0/CPU0:router# show mpls ldp bindings brief

 Prefix              Local Advertised Remote Bindings
                     Label (peers)         (peers)
 ----------------- -------- ---------- ---------------
 1.1.2.2/32          -          0          1
 1.2.3.4/32          16010      396        0
 4.4.4.4/32          16004      396        3
 10.0.0.0/24         19226      396        395
```

The following sample output shows that the binding matches with a local label:

```
RP/0/RP0/CPU0:router# show mpls ldp bindings local-only

 10.12.32.2/32, rev 4
        Local binding: label: IMP-NULL
        No remote bindings
```

The following sample output shows that the binding matches with a remote label:

```
RP/0/RP0/CPU0:router# show mpls ldp bindings remote-only

 10.26.4.0/24, rev 0
        No local binding
        Remote bindings: (1 peers)
            Peer              Label
            ----------------   --------
            10.6.6.6:0         IMP-NULL
 10.43.4.0/24, rev 0
        No local binding
        Remote bindings: (1 peers)
            Peer              Label
            ----------------   --------
            10.4.4.4:0         IMP-NULL
 10.46.4.0/24, rev 0
        No local binding
        Remote bindings: (2 peers)
            Peer              Label
            ----------------   --------
            10.4.4.4:0         IMP-NULL
            10.6.6.6:0         IMP-NULL
```

# show mpls ldp capabilities

To display the database capability information for an LDP session, use the **show mpls ldp capabilities** command in XR EXEC mode.

**show mpls ldp** [**vrf** *vrf-name*]  **capabilities** [**detail**] [**location** *node-id* | **standby**]

| Syntax Description | | |
|---|---|---|
| | **vrf** *vrf-name* | (Optional) Displays the VRF information for the specified VRF. |
| | **detail** | (Optional) Displays detailed database capability information for an LDP session. |
| | **location** *node-id* | (Optional) Displays location information for the specified node ID. |
| | **standby** | (Optional) Displays standby node-specific information. |

**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**    No specific guidelines impact the use of this command.

**Task ID**

| Task ID | Operation |
|---|---|
| mpls-ldp | read |

**Example**

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

```
RP/0/RP0/CPU0:router# show mpls ldp capabilities

  Type    Description                              Owner
  ------  ---------------------------------------  -----------
  0x50b   Typed Wildcard FEC                       LDP
  0x3eff  Cisco IOS-XR                             LDP
  0x508   MP: Point-to-Multipoint (P2MP)           mLDP
  0x509   MP: Multipoint-to-Multipoint (MP2MP)     mLDP
  0x703   P2MP PW                                  L2VPN-AToM
```

# show mpls ldp discovery

To display the status of the LDP discovery process, use the **show mpls ldp discovery** command in XR EXEC mode.

**show mpls ldp** [**afi-all**] [**vrf all**][**vrf** *vrf-name*] [**ipv4** | **ipv6**] **discovery** [*lsr-id ldp-id*] [*type interface-path-id* | **brief** | **link** | **targeted** | **summary** [**all**]] [**detail**] [**location** *node-id* | **standby**]

| Syntax Description | | |
|---|---|---|
| **afi-all** | | (Optional) Displays all address families. |
| **vrf all** | | (Optional) Displays all LDP configured VRFs. |
| **vrf** *vrf-name* | | (Optional) Displays the VRF information for the specified VRF. |
| **ipv4** | | (Optional) Specifies IP version 4 address family. |
| **ipv6** | | (Optional) Specifies IP version 6 address family. |
| *lsr-id* | | (Optional) Neighbor LSR ID in A.B.C.D format. |
| *ldp-id* | | (Optional) Neighbor LDP ID in A.B.C.D: format. |
| *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. |
| **brief** | | (Optional) Displays concise information about a specified LDP-enabled interface. |

| **link** | (Optional) Displays link information for LDP discovery. |
|---|---|
| **targeted** | (Optional) Displays targeted information for LDP discovery. |
| **summary** | (Optional) Displays summarized information for LDP discovery. |
| **all** | (Optional) Displays the aggregate summary across LDP processes and all VRFs. |
| **detail** | (Optional) Displays detailed information (including, inbound label filtering, session KAs, and session protection state) for an LDP session. |
| **location** *node-id* | (Optional) Displays location information for the specified node ID. |
| **standby** | (Optional) Displays standby node-specific information. |

**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 ldp discovery** command shows both link discovery and targeted discovery. When no interface filter is specified, this command generates a list of interfaces running the LDP discovery process. This command also displays neighbor discovery information for the default routing domain.

**Task ID**

| Task ID | Operations |
|---|---|
| mpls-ldp | read |

**Examples**

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

```
RP/0/RP0/CPU0:router# show mpls ldp discovery

  Local LDP Identifier: 10.44.44.44:0
  Discovery Sources:
    Interfaces:
        HundredGigE 0/1/0/0 : xmit/recv
         LDP Id: 10.33.33.33:0, Transport address: 10.33.33.33
```

<br>

```
        Hold time: 15 sec (local:15 sec, peer:15 sec)
```

This table describes the significant fields shown in the display.

**Table 5: show mpls ldp discovery Command Field Descriptions**

| Field | Description |
|---|---|
| Local LDP Identifier | LDP identifier for the local router. An LDP identifier is a 6-byte construct displayed in the form IP address:number. By convention, the first 4 bytes of the LDP identifier constitute the router ID; integers, starting with 0, constitute the final two bytes of the IP address:number construct. |
| Interfaces | Interfaces engaged in LDP discovery activity, as follows:<br><br>**xmit field**<br><br>Indicates that the interface is transmitting LDP discovery hello packets.<br><br>**recv field**<br><br>indicates that the interface is receiving LDP discovery hello packets.<br><br>The LDP identifiers indicate the LDP neighbors discovered on the interface. |
| Transport Address | Address associated with this LDP peer (advertised in hello messages). |
| LDP Id | LDP identifier of the LDP peer. |
| Hold time | State of the forwarding hold timer and its current value. |

The following sample output summarizes information for LDP discovery by using the **summary** keyword:

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

  LDP Identifier: 139.0.0.1:0
  Interfaces:
    Configured: 2
    Enabled   : 1
  Discovery:
    Hello xmit: 1 (1 link)
    Hello recv: 1 (1 link)
```

This table describes the significant fields shown in the display.

**Table 6: show mpls ldp discovery summary Command Field Descriptions**

| Field | Description |
|---|---|
| LDP Identifier | The LDP identifier for the local router. |

| Field | Description |
|-------|-------------|
| Interfaces | Summary of interfaces engaged in LDP activity. <br> **Configured** <br>   Number of interfaces configured for LDP. <br> **Enabled** <br>   Number of interfaces on which LDP is actively enabled and is thus sending LDP hellos. An interface configured for LDP is enabled only if running IP and not in the down state. |
| Discovery | Summary of LDP discovery process. <br> **Hello xmit** <br>   Number of local LDP discovery sources (including link and targeted hellos) emitting LDP hellos. <br> **Hello recv** <br>   Number of discovered hello sources via link or targeted hello mechanics. |

The following sample output shows the MPLS LDP discovery hello information in brief form:

```
RP/0/RP0/CPU0:router# show mpls ldp discovery brief

  Local LDP Identifier: 192.168.0.3:0

  Discovery Source        VRF Name      Peer LDP Id         Holdtime   Session
  ----------------------  ------------  ------------------  ---------  ----------
   PO0/3/0/2              default       192.168.0.1:0       15         Y
```

The following sample shows the MPLS LDP afi-all discovery brief command output:

```
RP/0/0/CPU0:router#show mpls ldp afi-all discovery brief

Local LDP Identifier: 192.168.0.1:0

Discovery Source     AFI  VRF Name        Peer LDP Id         Holdtime Session
-------------------- ---- --------------- -------------------- -------- -------
PO0/3/0/0            IPv6 default         192.168.0.2:0            15      Y
                     IPv4 default         192.168.0.2:0            15      Y
PO0/3/0/1            IPv4 default         192.168.0.3:0            15      Y
PO0/3/0/2            IPv4 default         192.168.0.4:0            15      Y
PO0/3/0/3            IPv6 default         192.168.0.3:0            15      Y
PO0/3/0/4            IPv6 default         192.168.0.5:0            15      Y
```

# show mpls ldp forwarding

To display the Label Distribution Protocol (LDP) forwarding state installed in MPLS forwarding, use the **show mpls ldp forwarding** command in XR EXEC mode.

**show mpls ldp** [**afi-all**][**vrf all**] [**vrf** *vrf-name*] [**ipv4** | **ipv6**] **forwarding** [*prefix*/*length*] [**fast-reroute**] [**detail**] [**next-hop** { **address** *ip-address* | **interface** *interface-path-id* | **label** *label-value* | **neighbor** *ldp-id* | **unlabelled** | **unlabelled-all** }] [**local-label** *label-value*] [**location** *node-id* | **summary** | **standby**] [**all**]

**Syntax Description**

| | |
|---|---|
| **afi-all** | (Optional) Displays all address families. |
| **vrf all** | (Optional) Displays all LDP configured VRFs. |
| **vrf** *vrf-name* | (Optional) Displays the VRF information for the specified VRF. |
| **ipv4** | (Optional) Specifies IP version 4 address family. |
| **ipv6** | (Optional) Specifies IP version 6 address family. |
| *prefix* | (Optional) Destination prefix, written in A.B.C.D format. |
| *length* | (Optional) Network mask length, in bits. Range is 0 to 32. |
| **detail** | (Optional) Displays detailed information for the LDP timestamp that is used for the routing and forwarding update. |
| **fast-reroute** | (Optional) Displays the prefix that is LFA FRR protected in nature. |
| **next-hop** | Matches prefixes by next-hop IP address. |
| **local-label** *label-value* | (Optional) Displays the prefix with the specified local label. Range is from 0 to 1048575. |
| **neighbor** | Matches prefixes with a path through specified LDP neighbor. |
| **unlabelled** | Matches prefixes containing unlabeled paths. |
| **unlabelled-all** | Matches prefixes containing all unlabeled paths. |
| **location** *node-id* | (Optional) Displays location information for the specified node ID. |
| **summary** | (Optional) Displays the summary information for the LDP forwarding information base (LFIB). |
| **standby** | (Optional) Displays standby-node specific information. |
| **all** | (Optional) Displays the aggregate summary across LDP processes and all VRFs. |

**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 ldp forwarding** command displays the LDP forwarding entries and provides LDP view of its installed forwarding entries.

**Task ID**

| Task ID | Operations |
|---|---|
| mpls-ldp | read |

**Examples**   This is a sample output from the **show mpls ldp forwarding** command:

**Note**   The (!) symbol referes to a non-primary LFA backup path.

This sample output shows detailed information for the LDP timestamp that is used for routing and forwarding update from the **detail** keyword:

```
RP/0/RP0/CPU0:router# show mpls ldp forwarding 10.0.0.1/32 detail

  Prefix            Label   Label      Outgoing      Next Hop         GR Stale
                    In      Out        Interface
---------------- ------- ---------- ------------ --------------- -- -----
  209.165.201.1/32         16000   16001      PO0/2/0/3.1    131.1.1.4         N  N
                           [ Protected; path-id 1 backup-path-id 33;
                           [peer 13.13.13.1:0 ]
                           16002      PO0/2/0/3.2    131.1.2.4        Y  N
                           [ Protected; path-id 2 backup-path-id 33;
                           peer 13.13.13.1:0 ]
                           16003      PO0/2/0/3.3    131.1.3.4        N  N
                           [ Protected; path-id 3 backup-path-id 34;
                           peer 13.13.13.2:0 ]
                           16002      PO0/2/0/1    192.11.1.1 (!)    Y  N
                           [ Backup; path-id 33; peer 14.14.14.1:0 ]
                           Unlabelled PO0/2/0/2    192.11.2.1 (!)    N  N
                           [ Backup; path-id 34 ]


    Routing update   : Mar 31 13:35:25.348 (00:55:32 ago)
    Forwarding update: Mar 31 13:35:25.349 (00:55:32 ago)
```

**Note**   The (!) symbol referes to a non-primary LFA backup path.

This sample output shows only LDP prefixes with protection (ECMP or secondary LFA backups) update from the **fast-reroute** keyword:

This sample output shows the statistics of protected prefixes and protected paths from the **summary** keyword:

```
RP/0/RP0/CPU0:router# show mpls ldp forwarding summary
Forwarding Server (LSD):
  Connected: Yes
  Forwarding State Holdtime: 360 sec
Forwarding States:
  Interfaces: 10
  Local labels: 8
  Rewrites:
    Prefix:
      Total: 8 (0 with ECMP, 8 FRR protected)
      Labelled:
        Primary pathset : 8 labelled (0 partial), 0 unlabelled
        Backup pathset  : 8 labelled (0 partial), 0 unlabelled
        Complete pathset: 8 labelled (0 partial), 0 unlabelled
    Paths:
      Total: 16 (8 backup, 8 FRR protected)
      Labelled: 16 (8 backup)
```

This sample output shows all the unlabeled prefixes using the **unlabelled-all** keyword:

```
Router# show mpls ldp forwarding next-hop unlabelled-all

Prefix          Label-In  Label(s)-Out  Outgoing-Interface Next Hop     Flags G S R E
--------------- -------   -------------  ------------       -------------------------------
14.14.14.14/32  24006     Unlabelled     Gi0/2/0/2          13.13.13.2
15.15.15.15/32  24007     Unlabelled     Gi0/2/0/2          13.13.13.2
16.16.16.16/32  24008     Unlabelled     Gi0/2/0/0          10.10.10.2
```

This table describes the significant fields shown in the display.

**Table 7: show mpls ldp forwarding Command Field Descriptions**

| Field | Description |
|---|---|
| Prefix/mask | Prefix on the FEC[2] for an MPLS forwarding entry. |
| Label In | Local label assigned to the prefix/mask. |
| Label Out | Outgoing label for the prefix/mask. |
| Outgoing Interface | Outgoing physical interface. |
| Next Hop | Next Hop address. |
| GR | Graceful restart status (Y or N). |
| Stale | Status of the entry, stale or not stale. An entry is marked stale when the next-hop graceful restart neighbor disconnects and is unmarked when neighbor reconnects and refreshes the label. |
| Chkpt | Status of the entry, checkpointed or not checkpointed. |
| path-id | Primary Path-id. |
| Backup-path-id | The backup path-id is the path-id of the path protecting a given primary path. A protecting path can be primary path or a non-primary path. |
| Peer | Displays next-hop LDP peer's LDP identifier. |

| Field | Description |
|---|---|
| Connected | Displays LDP connection state with LSD forwarding server. |
| Forwarding State Holdtime | Displays time that LDP has registered with LSD server to keep LDP forwarding state intact upon LDP disconnect event. |
| Interfaces | Number of LDP enabled MPLS interfaces. |
| Local Labels | Number of LDP allocated local labels from LSD. |
| Rewrites | Counts of Forwarding rewrites. Displays total number of known IPv4 prefixes alongwith information on number of prefixes with more than one ECMP path. This also displays number of prefixes with LFA-FRR protection. The labelled set prints the counts related to prefixes with none, all, partial labelled paths as shown by unlabeled, labelled, and partial keywords. This information is available for primary, backup, and complete path set. |
| Paths | Forwarding path counts. Displays count of total number of known forwarding paths, along with number of backup paths and number of FRR protected paths. It also displays the count of labelled paths indicating how many of non-primary paths are labelled. |

[2] Forwarding Equivalence Class.

# show mpls ldp graceful-restart

To display the status of the Label Distribution Protocol (LDP) graceful restart, use the **show mpls ldp graceful-restart** command in XR EXEC mode.

**show mpls ldp** [**vrf all**] [**vrf** *vrf-name*] **graceful-restart** [**location** *node-id* ] [**standby**] [ **detail** ]

| Syntax Description | | |
|---|---|---|
| **vrf all** | | (Optional) Displays all LDP configured VRFs. |
| **vrf** *vrf-name* | | (Optional) Displays the VRF information for the specified VRF. |
| **location** *node-id* | | (Optional) Displays location information for the specified node ID. |
| **standby** | | (Optional) Displays standby-node-specific information. |
| **detail** | | (Optional) Displays detailed information about the specified VRF. |

**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 ldp graceful-restart** command displays LDP graceful-restart-related information when the **graceful-restart** command is enabled.

**Task ID**

| Task ID | Operations |
|---|---|
| mpls-ldp | read |

**Examples**  The following shows a sample output from the **show mpls ldp graceful-restart** command:

```
RP/0/RP0/CPU0:router# show mpls ldp graceful-restart

    Forwarding State Hold timer : Not Running
    GR Neighbors               : 1

     Neighbor ID      Up  Connect Count  Liveness Timer      Recovery Timer
     ---------------  --  -------------  ------------------  ------------------
```

```
          10.0.0.2              Y      1              -                   -
```

This table describes the significant fields shown in the display.

*Table 8: show mpls ldp graceful-restart Command Field Descriptions*

| Field | Description |
|---|---|
| Forwarding State Hold timer | State of the hold timer—running or not running. |
| GR Neighbors | Number of graceful restartable neighbors. |
| Neighbor ID | Router ID of each neighbor. |
| Up | Neighbor up or down. |
| Connect Count | Number of times the same neighbor has reconnected. |
| Liveness Timer | State of the liveness timer (running or not running) and its expiration time, if running. |
| Recovery Timer | State of the recovery timer (running or not running) and its expiration time, if running. |

# show mpls ldp igp sync

To display Label Distribution Protocol (LDP) Interior Gateway Protocol (IGP) synchronization information on interface(s), use the **show mpls ldp igp sync** command in XR EXEC mode mode.

**show mpls ldp** [**afi-all**] [**vrf all**] [**vrf** *vrf-name*] [**ipv4** | **ipv6**] **igp sync** [**interface** *type interface-path-id*] [**brief**] [**location** *node-id* ] [**standby**]

**Syntax Description**

| | |
|---|---|
| **afi-all** | (Optional) Displays all address families. |
| **vrf all** | (Optional) Displays all LDP configured VRFs. |
| **vrf** *vrf-name* | (Optional) Displays the VRF information for the specified VRF. |
| **ipv4** | (Optional) Specifies IP version 4 address family. |
| **ipv6** | (Optional) Specifies IP version 6 address family. |
| **brief** | (Optional) Displays brief information about a specified LDP-enabled interface. |
| **interface** | (Optional) Displays the interface type. |
| *type* | (Optional) Interface type. For more information, use the question mark (?) online help function. |
| *interface-path-id* | (Optional) Physical interface or a virtual interface.<br><br>**Note** Use the **show interfaces** command to see a list of all possible interfaces currently configured on the router.<br><br>For more information about the syntax for the router, use the question mark (?) online help function. |
| **location** *node-id* | (Optional) Displays location information for the specified node ID. |

| | |
|---|---|
| **standby** | (Optional) Displays standby node-specific information. |

**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**  LDP IGP synchronization addresses traffic loss issues as a result of synchronization between MPLS LDP and IP (IGP). For instance, upon a link up, IGP can advertise a link before MPLS converges on the link. Also, the IGP link is still used even when MPLS session goes down and MPLS LSP is broken on this link. The use of IGP link is determined based on MPLS LDP convergence synchronization status on the link.

Use the **show mpls ldp igp sync** command to display MPLS convergence status. The configuration for LDP IGP synchronization resides in IGPs (OSPF, ISIS); accordingly, LDP displays and advertises this information for all LDP-enabled interfaces (regardless if the interface is configured for LDP IGP).

**Task ID**

| Task ID | Operations |
|---|---|
| mpls-ldp | read |

**Examples**  The following shows a sample output from the **show mpls ldp igp sync** command:

```
RP/0/RP0/CPU0:router# show mpls ldp igp sync

  POS0/3/0/2:
    VRF: 'default' (0x60000000)
    Sync delay: Disabled
    Sync status: Ready
      Peers:
      192.168.0.1:0   (GR)
```

This table describes the significant fields shown in the display.

**Table 9: show mpls ldp igp sync Command Field Descriptions**

| Field | Description |
|---|---|
| VRF | VRF of the interface. |

| Field | Description |
|---|---|
| Sync status | MPLS LDP convergence status on a given link. Ready indicates that the link is converged and is ready to be used by IGP. Not Ready with Deferred means that the link fulfills LDP IGP synchronization requirements but is deferred by LDP IGP synchronization delay timeout configuration setting. Not Ready means that the link is not ready to be used by IGP. |
| Peers | List of peers converged on the given link. If the peer session is GR[3]-enabled, output is tagged as GR. If GR-only reachability is indicated due to a GR neighbor record recovered from checkpoint after local start, then Chkpt-created flag is also set. |

[3]  Graceful Restart.

# show mpls ldp interface

To display information about LDP-enabled interfaces, use the **show mpls ldp interfaces** command in XR EXEC mode mode.

**show mpls ldp** [**afi-all**] [**ipv4** | **ipv6**] **interface** [*type interface-path-id* | **summary**] [**brief**] [**location** *node-id* | **standby**]

| Syntax Description | | |
|---|---|---|
| | **afi-all** | (Optional) Displays all address families. |
| | **ipv4** | (Optional) Specifies IP version 4 address family. |
| | **ipv6** | (Optional) Specifies IP version 6 address family. |
| | *type* | (Optional) Interface type. For more information, use the question mark (?) online help function. |
| | *interface-path-id* | Physical interface or a virtual interface. <br><br> **Note**    Use the **show interfaces** command to see a list of all possible interfaces currently configured on the router. <br><br> For more information about the syntax for the router, use the question mark (?) online help function. |
| | **summary** | (Optional) Displays summary information about a specified LDP-enabled interface. |
| | **brief** | (Optional) Displays concise information about a specified LDP-enabled interface. |
| | **detail** | (Optional) Displays detailed information about a specified LDP-enabled interface. |
| | **location** *node-id* | (Optional) Displays location information for the specified node ID. |
| | **standby** | (Optional) Displays standby-node-specific information. |

**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**

No specific guidelines impact the use of this command.

**Task ID**

| Task ID | Operations |
|---------|------------|
| mpls-ldp | read |

**Examples**

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

```
RP/0/RP0/CPU0:router# show mpls ldp interface

  Interface GigabitEthernet0/3/0/3
      No LDP config
  Interface POS0/2/0/0
      No LDP config
      Auto-config items:
          ospf/100/0
  Interface POS0/2/0/1
      No LDP config
      Auto-config items:
          ospf/100/0
  Interface POS0/2/0/2
      No LDP config
      Auto-config items:
          ospf/100/0
  Interface POS0/2/0/3
      No LDP config
      Auto-config items:
          ospf/100/0
```

This table describes the significant fields shown in the display.

**Table 10: show mpls ldp interface Command Field Descriptions**

| Field | Description |
|-------|-------------|
| Auto-config items | Lists IGPs that specify an interface for MPLS LDP auto-configuration:<br>**OSPF**<br>*ospf instance area*<br>**ISIS**<br>*isis instance* |

The following shows a sample output from the **show mpls ldp interface detail** command for the mesh groups:

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

Interface GigabitEthernet0/2/0/0 (0x20200040)
 Enabled via config: LDP interface
Interface GigabitEthernet0/2/0/1 (0x20200060)
 Disabled via config: IGP Auto-config disable
   Ignoring: LDP interface
Interface GigabitEthernet0/2/0/2 (0x20200080)
 Disabled via config: IGP Auto-config disable
   Ignoring: LDP interface
Interface tunnel-te1 (0x200000f0)
 Disabled
```

```
Interface tunnel-te100 (0x20000110)
 Enabled via config: TE Mesh-group 123, TE Mesh-group all
Interface tunnel-te101 (0x20000130)
 Enabled via config: TE Mesh-group 123, TE Mesh-group all
```

# show mpls ldp neighbor

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

**show mpls ldp** [**vrf all**] [**vrf** *vrf-name*] **neighbor** [*ip-address ldp-id*] [*type interface-path-id*] [**brief**] [**capabilities**] [**detail**] [**gr**] [**location** *node-id*] [**non-gr**] [**sp**] [**standby**]

| Syntax Description | | |
|---|---|---|
| **vrf all** | | (Optional) Displays all LDP configured VRFs. |
| **vrf** *vrf-name* | | (Optional) Displays the VRF information for the specified VRF. |
| *ip-address* | | (Optional) Neighbor IP address. |
| *ldp-id* | | (Optional) Neighbor LDP ID in A.B.C.D: format. |
| *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. |
| **brief** | | (Optional) Displays the existing LDP sessions in brief format. |
| **capabilities** | | (Optional) Displays the neighbor capabilities information. |
| **detail** | | (Optional) Displays detailed information (including, inbound label filtering, session KAs, and session protection state) for an LDP session. |
| **gr** | | (Optional) Displays graceful restartable neighbors. |

| location *node-id* | (Optional) Displays location information for the specified node ID. |
|---|---|
| **non-gr** | (Optional) Displays non-graceful restartable neighbors. |
| **sp** | (Optional) Displays neighbors with session protection. |
| **standby** | (Optional) Displays standby-node-specific information. |

**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 ldp neighbor** command provides information about all LDP neighbors in the entire routing domain—conversely, the show output is filtered to display:

- LDP neighbors with specific IP addresses
- LDP neighbors on a specific interface
- LDP neighbors that are graceful restartable
- LDP neighbors that are nongraceful restartable
- LDP neighbors enabled with session protection

**Task ID**

| Task ID | Operations |
|---|---|
| mpls-ldp | read |

**Examples**

The following shows a sample output from the **show mpls ldp neighbor** command using an IP address:

```
RP/0/RP0/CPU0:router# show mpls ldp neighbor 4.4.4.4

Peer LDP Identifier: 4.4.4.4:0
  TCP connection: 14.1.0.41:38022 - 10.0.0.1:646
  Graceful Restart: Yes (Reconnect Timeout: 120 sec, Recovery: 96 sec)
  Session Holdtime: 180 sec
  State: Oper; Msgs sent/rcvd: 1721/1716; Downstream-Unsolicited
  Up time: 1d00h
  LDP Discovery Sources:
    IPv4: (1)
      GigabitEthernet0/1/0/0
    IPv6: (0)
  Addresses bound to this peer:
    IPv4: (3)
      4.4.4.4        14.1.0.41      24.1.0.4
```

```
        IPv6: (0)
```

The following shows a sample output from the **show mpls ldp neighbor** command using the **non-gr** keyword:

```
RP/0/RP0/CPU0:router# show mpls ldp neighbor non-gr

  Peer LDP Identifier: 10.44.44.44:0
    TCP connection: 10.44.44.44:65535 - 10.33.33.33:646
    Graceful Restart: No
    State: Oper; Msgs sent/rcvd: 49/46
    Up time: 00:33:33
    LDP Discovery Sources:
      POS 0/1/0/0
    Addresses bound to this peer:
      10.44.44.44     10.10.3.2
  Peer LDP Identifier: 10.22.22.22:0
    TCP connection: 10.22.22.22:646 - 10.33.33.33:65530
    Graceful Restart: No
    State: Oper; Msgs sent/rcvd: 48/45
    Up time: 00:33:11
    LDP Discovery Sources:
      POS 0/2/0/0
    Addresses bound to this peer:
      10.22.22.22     10.10.2.1
```

This table describes the significant fields shown in the display.

**Table 11: show mpls ldp neighbor Command Field Descriptions**

| Field | Description |
|---|---|
| Peer LDP Identifier | LDP identifier of the neighbor (peer) for this session. |
| TCP connection | TCP connection used to support the LDP session, shown in the following format:<br>**neighbor IP address**<br>　　peer port<br>**local IP address**<br>　　local port |
| Graceful Restart | Graceful-restart status (Y or N). |
| State | State of the LDP session. Generally this is Oper (operational), but transient is another possible state. |
| Msgs sent/rcvd | Number of LDP messages sent to and received from the session peer. The count includes the transmission and receipt of periodic keepalive messages, which are required for maintenance of the LDP session. |
| Up time | The length of time that this session has been up for (in *hh:mm:ss* format). |
| LDP Discovery Sources | The source(s) of LDP discovery activity leading to the establishment of the LDP session. |

| Field | Description |
|-------|-------------|
| Addresses bound to this peer | The known interface addresses of the LDP session peer. These are addresses that might appear as "next hop" addresses in the local routing table. They are used to maintain the LFIB[4]. |

[4] LFIB = Label Forwarding Information Base.

The following shows a sample output from the **show mpls ldp neighbor** command using the **brief** keyword:

```
RP/0/RP0/CPU0:router# show mpls ldp neighbor brief

Peer              GR  NSR  Up Time    Discovery  Addresses    Labels
                                      ipv4  ipv6  ipv4  ipv6  ipv4  ipv6
----------------  --  ---  ---------- ---------- ---------- ------------
4.4.4.4:0         Y   N    1d00h      1     0     3     0     5     0
46.46.46.2:0      N   N    1d00h      1     1     3     3     5     5
46.46.46.46:0     Y   N    1d00h      2     2     4     4     5     5
6.6.6.1:0         Y   N    23:25:50   0     1     0     2     0     5
```

This table describes the significant fields shown in the display.

**Table 12: show mpls ldp neighbor brief Command Field Descriptions**

| Field | Description |
|-------|-------------|
| Peer | LDP identifier of the neighbor (peer) for this session. |
| GR | Graceful-restart status (Y or N). |
| Up Time | Time the session has been up (in hh:mm:ss format). |
| Discovery | Number of LDP discovery sources corresponding to the neighbor. |
| Address | Number of addresses bound to this peer. |

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

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

 Peer LDP Identifier: 172.16.0.1:0
   TCP connection: 172.16.0.1:11707 - 10.0.0.1:646
   Graceful Restart: No
   Session Holdtime: 180 sec
   State: Oper; Msgs sent/rcvd: 33/29
   Up time: 00:13:37
   LDP Discovery Sources:
     POS0/2/0/1
    Targeted Hello (10.0.0.1 ->172.16.0.1, active)
   Addresses bound to this peer:
     23.0.0.2 2.0.0.2       123.0.4.2       10.42.37.119
     10.2.2.2
   Peer holdtime: 180 sec; KA interval: 60 sec; Peer state: Estab
   Clients: Dir Adj Client
   Inbound label filtering: accept acl 'pfx_acl2'
```

```
              Session Protection:
                Enabled, state: Ready
                Duration: 30 seconds
```

This table describes the significant fields shown in the display.

*Table 13: show mpls ldp neighbor detail Command Field Descriptions*

| Field | Description |
|---|---|
| Peer LDP Identifier | LDP identifier of the neighbor (peer) for this session. |
| TCP connection | TCP connection used to support the LDP session, shown in the following format:<br>**neighbor IP address**<br> peer port<br>**local IP address**<br> local port |
| Graceful Restart | Graceful-restart status (Y or N). |
| Session Holdtime | Session hold time, in seconds. |
| State | State of the LDP session (operational or transient). |
| Msgs sent/rcvd | Number of LDP messages sent to and received from the session peer. The count includes the transmission and receipt of periodic keepalive messages, which are required for maintenance of the LDP session. |
| Up time | Time the session has been up for (in *hh:mm:ss* format). |
| Peer holdtime | Time to keep LDP peer session up without receipt of LDP protocol message from a peer. |
| Peer state | Peer session state. |
| Peer holdtime | Time to keep LDP peer session up without receipt of LDP protocol message from a peer. |
| Clients | LDP (internal) clients requesting session with a neighbor. |
| Inbound label filtering | LDP neighbor inbound filtering policy. |

| Field | Description |
|---|---|
| Session Protection | State of the session protection:<br><br>**Incomplete**<br><br>Targeted discovery requested but not yet up.<br><br>**Ready**<br><br>Targeted discovery and at least one link hello adjacency to the peer are up.<br><br>**Protecting**<br><br>Targeted discovery is up and there is no link hello adjacency to the peer. Targeted discovery is protecting and backing up link discoveries. |
| Duration | Maximum time to maintain session through targeted discovery upon loss of primary link discovery. |
| Holdtimer | When in "protecting" state, time to keep LDP peer session up without receipt of LDP protocol message from a peer. |

# show mpls ldp nsr pending neighbor

To display the nonstop routing (NSR) pending neighbor information for an LDP session, use the **show mpls ldp nsr pending neighbor** command in the XR EXEC mode.

**show mpls ldp** [**vrf** *vrf-name*] **nsr pending neighbor** [*lsr-id ldp-id*][**location** *node-id* | **standby**]

| Syntax Description | | |
|---|---|---|
| | **vrf** *vrf-name* | (Optional) Displays the VRF information for the specified VRF. |
| | *lsr-id* | (Optional) LSR ID of neighbor in A.B.C.D format. |
| | *ldp-id* | (Optional) LDP ID of neighbor in A.B.C.D: format. |
| | **location** *node-id* | (Optional) Displays location information for the specified node ID. |
| | **standby** | (Optional) Displays standby-node-specific information. |

**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**  No specific guidelines impact the use of this command.

**Task ID**

| Task ID | Operation |
|---|---|
| mpls-ldp | read |

### Example

The following example shows how to display NSR pending neighbor information for an LDP session:

```
RP/0/RP0/CPU0:router# show mpls ldp nsr pending neighbor
```

# show mpls ldp nsr statistics

To display the nonstop routing (NSR) statistics for an LDP session, use the **show mpls ldp nsr statistics** command in XR EXEC mode.

**show mpls ldp** [**vrf** *vrf-name*] **nsr statistics** [**location** *node-id* | **standby**] [**neighbor** [*lsr-id ldp-id*] [**location** *node-id* | **standby**]]

| Syntax Description | | |
|---|---|---|
| | **vrf** *vrf-name* | (Optional) Displays the VRF information for the specified VRF. |
| | **location** *node-id* | (Optional) Displays location information for the specified node ID. |
| | **standby** | (Optional) Displays standby-node-specific information. |
| | **neighbor** | (Optional) Displays neighbor information. |
| | *lsr-id* | (Optional) LSR ID of neighbor in A.B.C.D format. |
| | *ldp-id* | (Optional) LDP ID of neighbor in A.B.C.D: format. |

| **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** | No specific guidelines impact the use of this command. |
|---|---|

| **Task ID** | **Task ID** | **Operation** |
|---|---|---|
| | mpls-ldp | read |

**Example**

The following shows a sample output from the **show mpls ldp nsr statistics** command:

```
RP/0/RP0/CPU0:router# show mpls ldp nsr statistics

Global Init Sync:
```

```
      Start: Oct 27 12:12:23 (00:01:20 ago)
      End:   Oct 27 12:12:23 (00:01:20 ago)

   Protocol message stats:
     4 Peer, 5 Adj, 0 DHCB, 14/20 sent/rcvd Capabilities
     23 peer label for 18 FEC
     Send-Ack: 0 Lcl-Addr-WD

   Sync message stats:
     Tx msgs/bytes = 32/5024
     Rx msgs/bytes = 0/0
     Max IPC Tx/Rx bytes = 4396/0
     Default MTU bytes = 4768, IPCs exceeding MTU = 0
     TX current/total fail count = 0/0
     IPC restart count = 1
```

# show mpls ldp nsr summary

To display the nonstop routing (NSR) summary for an LDP session, use the **show mpls ldp nsr summary** command in XR EXEC mode.

**show mpls ldp** [**vrf all**] [**vrf** *vrf-name*] **nsr summary** [**location** *node-id* | **standby**] [**all**]

| Syntax Description | | |
|---|---|---|
| **vrf all** | | (Optional) Displays all LDP configured VRFs. |
| **vrf** *vrf-name* | | (Optional) Displays the VRF information for the specified VRF. |
| **location** *node-id* | | (Optional) Displays location information for the specified node ID. |
| **standby** | | (Optional) Displays standby-node-specific information. |
| **all** | | (Optional) Displays the aggregate summary across LDP processes and all VRFs. |

| **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** | No specific guidelines impact the use of this command. |
|---|---|

**Task ID**

| Task ID | Operation |
|---|---|
| mpls-ldp | read |

**Example**

The following shows a sample output from the **show mpls ldp nsr summary** command:

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

Sessions:
   Total: 1, NSR-eligible: 1, Sync-ed: 1
      (1 Oper)
```

# show mpls ldp parameters

To display current LDP parameters, use the **show mpls ldp parameters** command in XR EXEC mode mode.

**show mpls ldp** [**vrf** *vrf-name*] **parameters** [**location** *node-id* | **standby**]

| Syntax Description | | |
|---|---|---|
| **vrf** *vrf-name* | | (Optional) Displays the VRF information for the specified VRF. |
| **location** *node-id* | | (Optional) Displays location information for the specified node ID. |
| **standby** | | (Optional) Displays standby-node-specific information. |

**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 ldp parameters** command displays all LDP operational and configuration parameters.

**Task ID**

| Task ID | Operations |
|---|---|
| mpls-ldp | read |
| network | read |

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

```
RP/0/RP0/CPU0:router# show mpls ldp parameters

  LDP Parameters:
    Protocol Version: 1
    Router ID: 10.11.11.11
    Null Label: Implicit
    Session:
      Hold time: 180 sec
      Keepalive interval: 60 sec
      Backoff: Initial:15 sec, Maximum:120 sec
    Discovery:
      Link Hellos:     Holdtime:15 sec, Interval:5 sec
      Targeted Hellos: Holdtime:90 sec, Interval:10 sec
                      (Accepting peer ACL 'peer_acl_10')
    Graceful Restart:
      Enabled (Configured)
      Reconnect Timeout:120 sec, Forwarding State Holdtime:180 sec
```

```
     Timeouts:
       Binding with no-route: 300 sec
       LDP application recovery (with LSD): 360 sec
     OOR state
       Memory: Normal
```

This table describes the significant fields shown in the display.

*Table 14: show mpls ldp parameters Command Field Descriptions*

| Field | Description |
|---|---|
| Protocol Version | Version of LDP running on the platform. |
| Router ID | Currently used router ID. |
| Null Label | LDP use of implicit-null or explicit-null as label for prefixes where it has to use a null label. |
| Session Hold time | Time LDP session is to be maintained with an LDP peer without receiving LDP traffic or an LDP keepalive message from the peer. |
| Session Keepalive interval | Time interval between consecutive transmissions of LDP keepalive messages to an LDP peer. |
| Session Backoff | Initial maximum backoff time for sessions. |
| Discovery Link Hellos | Time to remember that a neighbor platform wants an LDP session without receiving an LDP hello message from the neighbor (hold time), and the time interval between the transmission of consecutive LDP hello messages to neighbors (interval). |
| Discovery Targeted Hellos | Indicates the time:<br><br>• To remember that a neighbor platform wants an LDP session when the neighbor platform is not directly connected to the router or the neighbor platform has not sent an LDP hello message. This intervening interval is known as *hold time*.<br>• Interval between the transmission of consecutive hello messages to a neighbor not directly connected to the router and if targeted hellos are being accepted, displaying peer-acl (if any). |
| Graceful Restart | Status of graceful-restart status (Y or N). |
| Timeouts | Various timeouts (of interest) that the LDP is using. One timeout is *binding no route*, which indicates how long the LDP waits for an invalid route before deleting it. It also shows restart recovery time for LSD and LDP. |
| OOR state | Out of resource memory state: Normal, Major, or Critical. |

# show mpls ldp statistics fwd-setup

To display the statistics of the forwarding setup counters related to RIB/LSD, use the **show mpls ldp statistics fwd-setup** command in XR EXEC mode.

**show mpls ldp** **statistics fwd-setup** [**location** *node-id* ]

| Syntax Description | | |
|---|---|---|
| | **vrf** *vrf-name* | (Optional) Displays the VRF information for the specified VRF. |
| | **location** *node-id* | (Optional) Displays location information for the specified node ID. |
| | **standby** | (Optional) Displays standby-node-specific information. |

**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**   No specific guidelines impact the use of this command.

**Task ID**

| Task ID | Operation |
|---|---|
| mpls-ldp | read |

**Example**

The following shows a sample output from the **show mpls ldp statistics fwd-setup** command:

```
RP/0/RP0/CPU0:router# show mpls ldp statistics fwd-setup

RIB
===

Thread counters:
  Events In         : 10
  Events Out        : 39
  RIB fetch throttled : 0 (0 during last throttle)

TC Thread counters:
  Events In         : 39 (3 skipped)
  Events Out        : 12 (0 failed, 2 skipped)

Address Family: IPv4
```

```
    RIB server connects: 1
    RIB converged: Yes
    Op counters:
      Fetch          : 4 (2 buffers per fetch)
                         no-data: 0
                         callbacks: 33 routes, 3 convg, 0 rcmd
      Route Up       : 33 (0 protected; Paths: 29/0/0 total/backup/protected)
      Route Down     : 0
      Route Filtered : 5 (0 intern, 5 misc, 0 alloc, 0 admin,
                          0 unsupp-intf 0, unsupp-protection,
                          0 bgp, 0 bgp-unlabelled, 0 ibgp-no-lbl-ucast)


MFI
===

Thread counters:
  Events In          : 9
  Events Out         : 8
  LSD Rsrc-Complete  : 1
  LSD server connects : 1

Op counters:
                           Successful      Failed
                           ----------      ------
      Control          :        3            0
      RCMD Markers     :        0            0
      State cleanup    :        0            0
      Interface Enable :        5            0
      Interface Disable :       0            0
      Label alloc      :        4            0
      Label alloc - mldp :      0            0
      Label free       :        0            0
      Label free - mldp :       0            0
      Rewrite create   :        6            0
      Rewrite delete   :        0            0
      Label/Rewrite create :    0            0
      Label/Rewrite delete :    0            0
      Label OOR cleared :       3            0

      Total LSD Reqs/Msgs :     7            0

LSD flow control status:
  Flow control        : 0
  Flow control cnt    : 0
  Evt queue item cnt  : 0
  Last flow control   : N/A
```

# show mpls ldp statistics msg-counters

To display statistics of the messages exchanged between neighbors, use the **show mpls ldp statistics msg-counters** command in XR EXEC mode mode.

**show mpls ldp** [**vrf** *vrf-name*] **statistics msg-counters** [*lsr-id ldp-id*] [**location** *node-id* | **standby**]

**Syntax Description**

| | |
|---|---|
| **vrf** *vrf-name* | (Optional) Displays the VRF information for the specified VRF. |
| *lsr-id* | (Optional) LSR ID of neighbor in A.B.C.D format. |
| *ldp-id* | (Optional) LDP ID of neighbor in A.B.C.D: format. |
| **location** *node-id* | (Optional) Displays location information for the specified node ID. |
| **standby** | (Optional) Displays standby-node-specific information. |

**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 ldp statistics msg-counters** command can provide counter information about different types of messages sent and received between neighbors.

**Task ID**

| Task ID | Operations |
|---|---|
| mpls-ldp | read |

**Examples**

The following shows a sample output from the **show mpls ldp statistics msg-counters** command:

```
RP/0/RP0/CPU0:router# show mpls ldp statistics msg-counters

  Peer LDP Identifier: 10.33.33.33:0
    Msg Sent: (80)
      Init             : 1
      Address          : 1
      Address_Withdraw : 0
      Label_Mapping    : 5
      Label_Withdraw   : 0
```

```
          Label_Release    : 0
          Notification     : 0
          KeepAlive        : 73

      Msg Rcvd: (81)
          Init             : 1
          Address          : 1
          Address_Withdraw : 0
          Label_Mapping    : 8
          Label_Withdraw   : 0
          Label_Release    : 0
          Notification     : 0
          KeepAlive        : 71
```

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

**Table 15: show mpls ldp statistics msg-counters Command Field Descriptions**

| Field | Description |
|---|---|
| Peer LDP Identifier | LDP identifier of the neighbor (peer). |
| Msg Sent | Summary of messages sent to the LDP peer. |
| Msg Rcvd | Summary of messages received from the LDP peer. |

# show mpls ldp summary

To display a summary of LDP information, use the **show mpls ldp summary** command in  mode.

**show mpls ldp** [**vrf all**] [**vrf** *vrf-name*] **summary** [**location** *node-id* | **standby**] [**all**]

| Syntax Description | vrf all | (Optional) Displays all LDP configured VRFs. |
|---|---|---|
| | vrf *vrf-name* | (Optional) Displays the VRF information for the specified VRF. |
| | location *node-id* | (Optional) Displays location information for the specified node ID. |
| | standby | (Optional) Displays standby-node-specific information. |
| | all | (Optional) Displays the aggregate summary across LDP processes and all VRFs. |

**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 ldp summary** command can provide information about the number of LDP neighbors, interfaces, forwarding state (rewrites), servers connection/registration, and graceful-restart information.

**Task ID**

| Task ID | Operations |
|---|---|
| mpls-ldp | read |

**Examples**    The following example shows a sample output from the **show mpls ldp summary** command:

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

  AFIs      : IPv4
  Routes    : 4
  Neighbors : 1 (1 GR)
  Hello Adj : 1
  Addresses : 3
  Interfaces: 4 LDP configured
```

The following example shows a sample output from the **show mpls ldp summary all** command:

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

   VRFs         : 1 (1 oper)
   AFIs         : IPv4
   Routes       : 4
   Neighbors    : 1 (1 GR)
   Hello Adj    : 1
   Addresses    : 3
   Interfaces   : 4 (1 forward reference, 2 LDP configured)
   Collaborators:

                    Connected   Registered
                    ---------   ----------
       SysDB            Y            Y
       IM               Y            Y
       RSI              Y            -
       IP-ARM           Y            -
       IPv4-RIB         Y            Y (1/1 tables)
       LSD              Y            Y
       LDP-NSR-Partner  Y            -
       L2VPN-AToM       Y            -
       mLDP             -            N
```

This table describes the significant fields shown in the display.

*Table 16: show mpls ldp summary Command Field Descriptions*

| Field | Description |
|---|---|
| Routes | Number of known IP routes (prefixes). |
| Neighbors | Number of LDP neighbors, including targeted and graceful restartable neighbors. |
| Hello Adj | Number of discovered LDP discovery sources. |
| Interfaces | Number of known IP interfaces and number of LDP configured interfaces. LDP is configured on a forward-referenced interface which may not exist or for which no IP address is configured. |
| Addresses | Number of known local IP addresses. |

# show mpls ldp trace

To display the Label Distribution Protocol (LDP) VRF event traces, use the **show mpls ldp trace vrf** command in XR EXEC mode.

**show mpls ldp trace vrf**
**[binding] [capabilities] [config] [dev] [discovery] [error]** [**file** *file-name*]
**[forwarding] [gr] [hexdump] [iccp] [igp-sync] [interface] [last]**
[**location** {*node-id name all mgmt-nodes*}] **[misc] [mldp] [nsr] [peer] [process] [pw]**
**[reverse] [route] [since] [stats] [tailf] [unique] [usec]**
**[verbose] [wide] [wrapping]**

| Syntax Description | | |
|---|---|---|
| **binding** | | (Optional) Displays the binding event traces. |
| **capabilities** | | (Optional) Displays the capabilities event traces. |
| **config** | | (Optional) Displays the configuration event traces. |
| **dev** | | (Optional) Displays the development private traces. |
| **discovery** | | (Optional) Displays Hello or discovery and adj event traces. |
| **error** | | (Optional) Displays error traces. |
| **file** *file-name* | | (Optional) Displays trace of a specific file. |
| **forwarding** | | (Optional) Displays forwarding event traces. |
| **gr** | | (Optional) Displays graceful-restart event traces. |
| **hexdump** | | (Optional) Displays traces in hexadecimal. |
| **iccp** | | (Optional) Displays ICCP signaling event traces. |
| **igp-sync** | | (Optional) Displays IGP sync event traces. |
| **interface** | | (Optional) Displays interface event traces. |
| **last** | | (Optional) Displays last number of entries. |

| | |
|---|---|
| **location** | (Optional) Identifies the location of the card whose CPU controller trace information you want to display. |
| *node-id* | The node-id argument is expressed in the **rack/slot/module** notation. |
| *name* | Specifies the name of the card. |
| *all* | Specifies all locations. |
| *mgmt-nodes* | Specifies all managements nodes. |
| **misc** | (Optional) Displays miscellaneous event traces. |
| **mldp** | (Optional) Displays MLDP event traces. |
| **nsr** | (Optional) Displays non-stop routing event traces. |
| **peer** | (Optional) Displays peer session event traces. |
| **process** | (Optional) Displays process-level event traces. |
| **pw** | (Optional) Displays L2VPN pseudo-wire event traces. |
| **reverse** | (Optional) Displays latest traces first. |
| **route** | (Optional) Displays route event traces. |
| **since last-start** | (Optional) Displays traces since the last start time. |
| **stats** | (Optional) Displays statistics. |
| **tailf** | (Optional) Displays new traces as they are added. |
| **unique** | (Optional) Displays unique entries with count. |
| **usec** | (Optional) Displays timestamp w/usec detail. |
| **verbose** | (Optional) Displays internal debugging information. |

| | |
|---|---|
| **wide** | (Optional) Do not display buffer name, node name and tid. |
| **wrapping** | (Optional) Displays wrapping entries. |

**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**    No specific guidelines impact the use of this command.

**Task ID**

| Task ID | Operation |
|---|---|
| mpls-ldp | read |

### Example

The following example shows how to display the LDP VRF event traces:

```
RP/0/RP0/CPU0:router# show mpls ldp trace vrf


4 wrapping entries (992576 possible, 38720 allocated, 4377 filtered, 4381 total)
Nov 23 05:54:44.332 mpls/ldp/vrf 0/RP0/CPU0 t7181 [VRF]:718: Tbl(0xe0000000):
ldp_vrf_tbl_go_active: afi IPv4
Nov 23 05:54:44.335 mpls/ldp/vrf 0/RP0/CPU0 t7181 [VRF]:604: VRF(0x60000000):
ldp_vrf_ctx_enable done
Nov 23 05:54:44.360 mpls/ldp/vrf 0/RP0/CPU0 t7181 [VRF]:703: VRF(0x60000000):
ldp_vrf_ctx_af_enable done: afi IPv4
Nov 23 05:54:44.360 mpls/ldp/vrf 0/RP0/CPU0 t7181 [VRF]:718: Tbl(0xe0800000):
ldp_vrf_tbl_go_active: afi IPv6
```

# signalling dscp (LDP)

To assign label distribution protocol (LDP) signaling packets a differentiated service code point (DSCP) to assign higher priority to the control packets while traversing the network, use the **signalling dscp** command in MPLS LDP configuration mode. To return to the default behavior, use the **no** form of this command.

**signalling dscp** *dscp*
**no signalling dscp**

| | |
|---|---|
| **Syntax Description** | *dscp*   DSCP priority value. Range is 0 to 63. |

| | |
|---|---|
| **Command Default** | LDP control packets are sent with precedence 6 (*dscp* : 48) |

| | |
|---|---|
| **Command Modes** | MPLS LDP configuration |

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**

DSCP marking improves signaling setup and teardown times.

Ordinarily, when LDP sends hello discovery or protocol control messages, these are marked using the default control packet precedence value (6, or *dscp* 48). You can use the **signalling dscp** command to override that DSCP value to ensure that all control messages sent are marked with a specified DSCP.

| **Note** | While the **signalling dscp** command controls LDP signaling packets (Discovery hellos and protocol messages), it has no effect on ordinary IP or MPLS data packets. |
|---|---|

**Task ID**

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

**Examples**

The following example shows how to assign LDP packets a DSCP value of 56:

```
RP/0/RP0/CPU0:router(config-ldp)# signalling dscp 56
```

# snmp-server traps mpls ldp

To inform a network management system of session and threshold cross changes, use the **snmp-server traps mpls ldp** command in global configuration mode.

**snmp-server traps mpls ldp**  {**up** | **down** | **threshold**}

| Syntax Description | | |
|---|---|---|
| **up** | Displays the session-up notification. | |
| **down** | Displays the session-down notification. | |
| **threshold** | Displays the session-backoff-threshold crossed notification. | |

**Command Default**  LDP does not send SNMP traps.

**Command Modes**  XR Config mode

**Command History**

| Release | Modification |
|---|---|
| Release 7.0.12 | This command was introduced. |

**Usage Guidelines**  The **snmp-server traps mpls ldp** command sends notifications to the SNMP server. There are three types of traps sent by LDP:

**Session up**

Generated when sessions go up.

**Session down**

Generated when sessions go down.

**Threshold**

Generated when attempts to establish a session fails. The predefined value is 8.

**Task ID**

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

**Examples**  The following example shows how to enable LDP SNMP trap notifications for Session up:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps mpls ldp up
```

# static

To enable Multicast Label Distribution Protocol (MLDP) static LSP support, use **static** command in MPLS LDP MLDP configuration

**address-family ipv4 static** {**mp2mp** *ip-address* | **p2mp** *ip-address*}

| Syntax Description | **mp2mp** *ip-address* | Specifies multi-point to multi-point (MP2MP) LSP root IP address followed by the number of LSPs in the range 1 to 1000. |
| --- | --- | --- |
| | **p2mp** *ip-address* | Specifies point to multi-point (P2MP) LSP root IP address followed by the number of LSPs in the range 1 to 1000. |

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

| Command Modes | MPLS LDP MLDP configuration |
| --- | --- |

| Command History | **Release** | **Modification** |
| --- | --- | --- |
| | Release 7.0.12 | This command was introduced. |

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

Task ID

| Task ID | Operation |
| --- | --- |
| mpls-ldp | read |

**Example**

The following example shows how to set up MLDP static support for MP2MP with forty five LSPs:

```
RP/0/RP0/CPU0:router(config-ldp-mldp)# address-family ipv4 static mp2mp 10.0.0.1 45
```