

MPLS Label Distribution Protocol Commands

This module describes the commands used to configure Label Distribution Protocol (LDP) in a Multiprotocol Label Switching (MPLS) network on Cisco ASR 9000 Series RoutersCisco NCS 4000 Series Router.

LDP provides a standard methodology for hop-by-hop (or dynamic label) distribution in an MPLS network by assigning labels to routes that have been chosen by the underlying Interior Gateway Protocol (IGP) routing protocols. The resulting labeled paths, called *label switch paths* (LSPs), forward labeled traffic across an MPLS backbone.

LDP also provides the means for label switching routers (LSRs) to request, distribute, and release label prefix binding information to peer routers in a network. LDP enables LSRs to discover potential peers and establish LDP sessions with those peers to exchange label binding information.

For detailed information about MPLS concepts, configuration tasks, and examples, see *MPLS Configuration Guide for Cisco ASR 9000 Series Routers*.

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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*

Syntax Description

initial	Initial backoff delay, in seconds. Range is 5 to 2147483 .
maximum	Maximum backoff delay, in seconds. Range is 5 to 2147483 .

Command Default

initial : 15

maximum : 120

Command Modes

MPLS LDP configuration

Command History

Release	Modification
Release 3.0	No modification.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.7.2	This command was introduced.
Release 3.8.0	No modification.

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/RP0RSP0/CPU0:router:hostname# configure
RP/0/RP0RSP0/CPU0:router:hostname(config)# mpls ldp
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# backoff 30 240
```

Related Commands

Command	Description
show mpls ldp backoff	Displays information about the configured session setup backoff parameters and LDP peers.
show mpls ldp parameters	Displays current LDP parameter settings.

clear mpls ldp forwarding

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

EXEC modeXR EXEC mode

Command History

Release	Modification
Release 4.0.1	This command was introduced.
Release 5.0.0	This command was introduced.
Release 5.1.1	The **vrf** and **ipv4** keywords were added.
Release 5.3.0	The **ipv6** keyword was added.

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/RP0RSP0/CPU0:router:hostname# clear mpls ldp forwarding
```

Related Commands

Command	Description
show mpls ldp forwarding	Displays the LDP forwarding state installed in MPLS forwarding.
show mpls forwarding	Displays the contents of the MPLS Label Forwarding Information Base (LFIB).
graceful-restart (MPLS LDP), on page 32	Configures the LDP graceful restart feature.
show mpls ldp bindings, on page 86	Displays the contents of LDP LIB.

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 EXEC modeXR EXEC 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

EXEC modeXR EXEC mode

Command History

Release	Modification
Release 3.0	No modification.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.7.2	This command was introduced.
Release 3.8.0	No modification.

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/RP0RSP0/CPU0:router:hostname# clear mpls ldp msg-counters neighbor 10.20.20.20
```

Related Commands

Command	Description
show mpls ldp statistics msg-counters, on page 122	Displays statistics about the type and count of the messages sent and received from neighbors.

clear mpls ldp neighbor

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

EXEC modeXR EXEC mode

Command History

Release	Modification
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.7.2	This command was introduced.
Release 3.8.0	No modification.
Release 3.9.0	No modification.
Release 5.1.1	The **vrf** and **vrf all** keywords were added.

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/RP0RSP0/CPU0:router:hostname# clear mpls ldp neighbor 10.20.20.20
```

Related Commands

Command	Description
show mpls ldp neighbor, on page 107	Displays information about LDP neighbors.

clear mpls ldp nsr statistics neighbor

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

EXEC modeXR EXEC mode

Command History

Release	Modification
Release 5.1.1	This command was introduced.

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/RP0RSP0/CPU0:router:hostname#clear mpls ldp nsr statistics neighbor 10.20.20.20
```

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 EXEC modeXR 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*]

Syntax Description

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

Command Default

No default behavior or values

Command Modes

EXEC modeXR EXEC mode

Command History

Release	Modification
Release 5.1.1	This command was introduced.

Task ID

Task ID	Operation
mpls-ldp	read

Example

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

```
RP/0/RP0RSP0/CPU0:router:hostname# 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 EXEC modeXR 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*]

Syntax Description

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

Command Default

No default behavior or values

Command Modes

EXEC modeXR EXEC mode

Command History

Release	Modification
Release 5.1.1	This command was introduced.

Task ID

Task ID	Operation
mpls-ldp	read

Example

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

```
RP/0/RP0RSP0/CPU0:router:hostname# 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

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 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.7.2	This command was introduced.
Release 3.8.0	No modification.
Release 3.9.0	No modification.

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/RP0RSP0/CPU0:router:hostname(config-ldp)# default-route
```

Related Commands

Command	Description
show mpls ldp bindings, on page 86	Displays LDP label bindings.

Command	Description
show mpls ldp forwarding, on page 97	Displays LDP installed forwarding state.

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 5.3.0	This command was introduced.

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*}

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 3.0	No modification.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.7.2	This command was introduced.
Release 3.8.0	No modification.
Release 3.9.0	No modification.

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/RP0RSP0/CPU0:router:hostname(config-ldp)# discovery hello holdtime 30
```

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

```
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# discovery hello interval 10
```

Related Commands

Command	Description
#unique_20	Configures targeted-hello messages.

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

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 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.7.2	This command was introduced.
Release 3.8.0	No modification.
Release 3.9.0	No modification.

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/RP0RSP0/CPU0:router:hostname# configure
RP/0/RP0RSP0/CPU0:router:hostname(config)# mpls ldp
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# discovery instance-tlv disable
```

Related Commands

Command	Description
#unique_20	Configures targeted-hello messages.

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*}

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 3.0	No modification.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.7.2	This command was introduced.
Release 3.8.0	No modification.
Release 3.9.0	No modification.

Release	Modification
Release 5.3.0	The **ipv6** keyword was added.

Usage Guidelines

- LDP supports IPv4 standard access lists only.
- When you configure the **targeted-hello interval** and **holdtime** for MPLS LDP, the interval is determined by this formula:

  Effective targeted-hello interval = min ("targeted-hello interval", "holdtime/9")

  Example: If you set the **targeted-hello interval** to 10 seconds and the **holdtime** to 45 seconds, the effective interval becomes 5 seconds because minimum of (10, 45/9) is equal to 5.

  To maintain a 10 second interval, set the **holdtime** to at least 90 seconds. Adjust these parameters to suit your network requirements.

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/RP0RSP0/CPU0:router:hostname(config-ldp)# discovery targeted-hello holdtime 45
```

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

```
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# discovery targeted-hello interval 5
```

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

```
RP/0/RP0RSP0/CPU0:router:hostname(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/RP0RSP0/CPU0:router:hostname(config)# ipv4 access-list peer_acl_10
RP/0/RP0RSP0/CPU0:router:hostname(config-ipv4-acl)# permit 10.1.1.1
RP/0/RP0RSP0/CPU0:router:hostname(config-ipv4-acl)# permit 10.2.2.2
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# discovery targeted-hello accept from
peer_acl_10
```

Related Commands

Command	Description
show mpls ldp discovery, on page 93	Displays LDP discovery information.
show mpls ldp parameters, on page 117	Displays LDP parameters information.

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**}

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 3.0	No modification.

Release	Modification
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.7.2	This command was introduced.
Release 3.8.0	No modification.
Release 3.9.0	No modification.
Release 5.1.1	The following items were added: • The **vrf** keyword was added. • The **interface** keyword was added. • The **address-family ipv4** keyword was added.
Release 5.3.0	The **ipv6** keyword was added.

Usage Guidelines

Establishing an LDP session between two routers requires a session TCP connection. To establish the session TCP 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 POS 0/1/0/0:

```
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# interface POS 0/1/0/0
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp-if)# address-family ipv4
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp-if-af)#discovery transport-address 10.10.3.1

RP/0/RP0RSP0/CPU0:router:hostname# 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
```

Related Commands

Command	Description
show mpls ldp discovery, on page 93	Displays the status of the LDP discovery process.
show mpls ldp neighbor, on page 107	Displays information about LDP neighbors.

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*

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 6.0	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/RP0RSP0/CPU0:router:hostname(config-ldp)# downstream-on-demand with access-list
```

entropy-label

To enable entropy label LDP signaling on the transit LSR in an MPLS network, use the **entropy-label** command in MPLS LDP configuration mode.

To remove this configuration, use the **no** form of the command.

entropy-label [**add-el**]

no entropy-label [**add-el**]

Syntax Description

add-el	(Optional) Specifies that the entropy label and indicator be added to the MPLS label stack. Enable the **add-el** keyword on the ingress router.

Command Default

None

Command Modes

MPLS LDP configuration mode.

Command History

Release	Modification
Release 6.6.2	This command was introduced.
Release 7.2.2	The **add-el** option was added as an ingress router configuration.

Usage Guidelines

Entropy labels are used by the transit LSR for efficient load balancing of traffic through the MPLS network. An entropy label is inserted on top of the MPLS label stack at the transit LSR . Entropy labels help the smooth operation of the transit LSRs by relieving them of the task of deep packet inspection.

The **entropy-label** command supports an orderly method for routers to signal entropy label capability (ELC) in the network. When enabled, the Cisco routers wait for the ELC signal from all downstream routers before passing their ELC to the next upstream routers in the chain. This eliminates the confusion that can occur when routers report their status randomly. If just one router in the chain does not support entropy label (EL), then the network will not use EL for load balancing. Random reporting could result in a lot of back and forth signaling before ELC is firmly established in the network.

Enable the **add-el** option on the ingress MPLS LDP router where the entropy label has to be added to the MPLS label stack. On the ingress router, use the **show mpls ldp forwarding** command to verify that the egress router has communicated its entropy label capability.

Example

The following example shows how you can configure entropy label LDP signaling on transit LSR for load balancing.

```
RP/0/RP0RSP0/CPU0:router:hostname(config)# cef load-balancing fields mpls entropy-label
RP/0/RP0RSP0/CPU0:router:hostname(config)# mpls ldp
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# entropy-label
```

```
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# commit
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# end
```

This following example shows how to enable MPLS entropy label encapsulation on the ingress router.

```
Router(config)# mpls ldp entropy-label add-el
Router(config)# commit
```

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*]]

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 3.0	No modification.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.

Release	Modification
Release 3.7.0	No modification.
Release 3.7.2	This command was introduced.
Release 3.8.0	No modification.
Release 3.9.0	No modification.
Release 5.0.0	This command was introduced.
Release 5.1.1	• The **vrf** keyword was added. • The **adress-family ipv4** keyword was added. • The **label** keyword was added. • The **local** keyword was added. • The **advertise** keyword was added.
Release 5.3.0	The **ipv6** keyword was added.

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/RP0RSP0/CPU0:router:hostname(config-ldp)# 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/RP0RSP0/CPU0:router:hostname(config)# ipv4 access-list pfx_acl_192_168
RP/0/RP0RSP0/CPU0:router:hostname(config-ipv4-acl)# permit 192.168.0.0
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# 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/RP0RSP0/CPU0:router:hostname(config)# ipv4 access-list peer_acl_10
RP/0/RP0RSP0/CPU0:router:hostname(config-ipv4-acl)# permit 10.1.1.1
RP/0/RP0RSP0/CPU0:router:hostname(config-ipv4-acl)# permit 10.2.2.2

RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# 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/RP0RSP0/CPU0:router:hostname(config-ldp)# explicit-null for pfx_acl_192_168 to
peer_acl_10
```

Related Commands

Command	Description
show mpls ldp bindings, on page 86	Displays the contents of LDP LIB.
show mpls ldp forwarding, on page 97	Displays the contents of the LDP forwarding database.
show mpls ldp parameters, on page 117	Displays current LDP parameter settings.

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*]

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 3.0	No modification.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.7.2	This command was introduced.
Release 3.8.0	No modification.
Release 3.9.0	The maximum value for the seconds argument is 1800.

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 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/RP0RSP0/CPU0:router:hostname(config-ldp)# graceful-restart

RP/0/RP0RSP0/CPU0:router:hostname:Apr  3 10:56:05.392 : mpls_ldp[336]:
%ROUTING-LDP-5-NBR_CHANGE : Nbr 172.16.0.1:0, DOWN
RP/0/RP0RSP0/CPU0:router:hostname:Apr  3 10:56:05.392 : mpls_ldp[336]:
%ROUTING-LDP-5-NBR_CHANGE : Nbr 192.168.0.1:0, DOWN
RP/0/RP0RSP0/CPU0:router:hostname:Apr  3 10:56:09.525 : mpls_ldp[336]:
%ROUTING-LDP-5-NBR_CHANGE : Nbr 192.168.0.1:0, UP
RP/0/RP0RSP0/CPU0:router:hostname:Apr  3 10:56:11.114 : mpls_ldp[336]:
%ROUTING-LDP-5-NBR_CHANGE : Nbr 172.16.0.1:0, UP

RP/0/RP0RSP0/CPU0:router:hostname# 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/RP0RSP0/CPU0:router:hostname# 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                -                   -
```

Related Commands

Command	Description
show mpls ldp forwarding, on page 97	Displays the contents of the LDP forwarding database.
show mpls ldp graceful-restart, on page 100	Displays information related to graceful restart.
show mpls ldp neighbor, on page 107	Displays information about LDP neighbors.
show mpls ldp parameters, on page 117	Displays current LDP parameter settings.
show mpls ldp summary, on page 124	Displays summarized information regarding the LDP process.

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*

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 3.0	No modification.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.7.2	This command was introduced.
Release 3.8.0	No modification.
Release 3.9.0	No modification.

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/RP0RSP0/CPU0:router:hostname(config-ldp)# session holdtime 30
```

Related Commands

Command	Description
show mpls ldp parameters, on page 117	Displays current LDP parameter settings.

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 Admin Configuration modeSystem Admin Config mode. To enable label allocation over BVI, use the **no** form of this command.

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

Admin Configuration modeSystem Admin Config mode

Command History

Release	Modification
Release 5.1.2	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/RP0RSP0/CPU0:router:hostname#admin
RP/0/RP0RSP0/CPU0:router:hostname(admin)#configure
RP/0/RP0RSP0/CPU0:router:hostname(admin-config)#hw-module label-allocation bvi-routes disable
```

hw-module l3 feature mpls-over-udp-decap enable

To enable UDP decapsulation of UDP-encapsulated MPLS traffic on the ASR 9000 Series router, configure the **hw-module l3 feature mpls-over-udp-decap enable** command in Global Configuration modeXR Config mode. To return to the default behavior, use the **no** form of this command.

hw-module l3 feature mpls-over-udp-decap enable

This command has no keywords or arguments.

Command Default

UDP decapsulation function is disabled.

Command Modes

Global Configuration modeXR Config mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

When you enable this command on a WAN edge ASR 9000 Series router, the UDP header is removed from UDP-encapsulated MPLS traffic. Based on the MPLS label, the traffic is forwarded towards the destination. If you don't enable this function, the WAN edge router drops the UDP-encapsulated MPLS traffic it receives.

Task ID

Task ID	Operations
mpls-ldp	read, write

Examples

The following example shows how to configure UDP decapsulation function:

```
Router# configure
Router(config)# hw-module l3 feature mpls-over-udp-decap enable
Router(config)# commit
```

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

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 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.7.2	This command was introduced.
Release 3.8.0	No modification.
Release 3.9.0	No modification.

Usage Guidelines

IGP auto-configuration can be enabled on ISIS and OSPF. Configuration details are described in *Cisco ASR 9000 Series Aggregation Services Router Routing Configuration Guide*.

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/RP0RSP0/CPU0:router:hostname(config)# mpls ldp
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# interface pos 0/1/0/3
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp-if)# igp auto-config disable
```

Related Commands

Command	Description
show mpls ldp interface, on page 105	Displays information about LDP-enabled interfaces.

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*

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 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.7.2	This command was introduced.
Release 3.8.0	No modification.
Release 3.9.0	No modification.

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/RP0RSP0/CPU0:router:hostname# configure
RP/0/RP0RSP0/CPU0:router:hostname(config)# mpls ldp
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# igp sync delay 30
```

Related Commands

Command	Description
show mpls ldp igp sync, on page 102	Displays LDP IGP sync information for link(s).

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*

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 3.9.0	This command was introduced.
Release 3.9.0	No modification.

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/RP0RSP0/CPU0:router:hostname# configure
RP/0/RP0RSP0/CPU0:router:hostname(config)# mpls ldp
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# igp sync delay on-proc restart 60
```

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

```
RP/0/RP0RSP0/CPU0:router:hostname# 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
```

Related Commands

Command	Description
show mpls ldp igp sync, on page 102	Displays LDP IGP sync information for link(s).

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*}

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 4.2.1	This command was introduced.
Release 5.1.1	The following items were added: • The **vrf** keyword was added. • The **adress-family ipv4** keyword was added. • The **label** keyword was added. • The **local** keyword was added.

Release	Modification
Release 5.3.0	The **ipv6** keyword was added.

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/RP0RSP0/CPU0:router:hostname(config-ldp)# 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*

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 3.0	No modification.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.8.0	No modification.
Release 3.9.0	This command was introduced.
Release 5.1	The Bridge-Group Virtual Interface (BVI) configuration was added to support MPLS LDP over Integrated Routing and Bridging (IRB).

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.

MPLS LDP is supported over Integrated Routing and Bridging (IRB) by enabling the Bridge-Group Virtual Interface (BVI) configuration. Just like the physical interface, MPLS LDP discovers LDP neighbors on the bridge domain represented by the BVI. With the BVI configuration, LDP session is established with potential peers and the labeled packets are switched (impose, dispose, and, label-switched).

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/RP0RSP0/CPU0:router:hostname# configure
RP/0/RP0RSP0/CPU0:router:hostname(config)# mpls ldp
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# interface POS 0/1/0/0
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp-if)#
```

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

```
RP/0/RP0RSP0/CPU0:router:hostname# configure
RP/0/RP0RSP0/CPU0:router:hostname(config)# mpls ldp
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# interface tunnel-te 123
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp-if)#
```

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

```
RP/0/RP0RSP0/CPU0:router:hostname#configure
RP/0/RP0RSP0/CPU0:router:hostname(config)#mpls ldp
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)#interface BVI 65535
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp-if)#
```

Related Commands

Command	Description
show mpls ldp parameters, on page 117	Displays current LDP parameter settings.
show mpls ldp neighbor, on page 107	Displays LDP neighbor session parameters.

l2vpn neighbor all ldp flap

To flap the LDP sessions in order to enable interoperability with the peer router which does not support label request, use the **l2vpn neighbor all ldp flap** command in Global Configuration modeXR Config mode.

To return to the default behavior, use the **no** form of this command.

l2vpn neighbor all ldp flap

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Global Configuration modeXR Config mode

Command History

Release	Modification
Release 4.3.4	This command was introduced.

Usage Guidelines

Configuring the **l2vpn neighbor all ldp flap** command flaps all the LDP sessions when a route processor fail over (RPFO) occurs.

Task ID

Task ID	Operation
l2vpn	read, write

The following example shows how to flap the LDP sessions:

```
RP/0/RP0RSP0/CPU0:router:hostname#config
RP/0/RP0RSP0/CPU0:router:hostname#l2vpn neighbor all ldp flap
RP/0/RP0RSP0/CPU0:router:hostname#commit
```

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*

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 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.7.2	This command was introduced.
Release 3.8.0	No modification.
Release 3.9.0	No modification.

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/RP0RSP0/CPU0:router:hostname(config-ldp)# label accept
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp-lbl-acpt)# for pfx_acl_1 from 10.0.0.1
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp-lbl-acpt)# for pfx_acl_2 from 172.16.0.1
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp-lbl-acpt)# for pfx_acl_3 from 209.165.201.1
```

Related Commands

Command	Description
label advertise, on page 51	Controls advertisement of LDP local label bindings (outbound label filtering).
show mpls ldp bindings, on page 86	Displays LDP binding information.

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*]

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 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.7.2	This command was introduced.
Release 3.8.0	No modification.
Release 3.9.0	No modification.

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 will be 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 the 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 (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/RP0RSP0/CPU0:router:hostname(config-ldp)# label advertise
RP/0/RP0RSP0/CPU0:router:hostname(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/RP0RSP0/CPU0:router:hostname(config)# ipv4 access-list pfx_acl_1
RP/0/RP0RSP0/CPU0:router:hostname(config-ipv4-acl)# permit 10.1.1.0
RP/0/RP0RSP0/CPU0:router:hostname(config-ipv4-acl)# permit 20.1.1.0

RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# label advertise
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp-lbl-advt)# disable
RP/0/RP0RSP0/CPU0:router:hostname(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/RP0RSP0/CPU0:router:hostname(config)# ipv4 access-list pfx_acl_10
RP/0/RP0RSP0/CPU0:router:hostname(config-ipv4-acl)# permit 10.0.0.0

RP/0/RP0RSP0/CPU0:router:hostname(config)# ipv4 access-list pfx_acl_20
RP/0/RP0RSP0/CPU0:router:hostname(config-ipv4-acl)# permit 20.0.0.0

RP/0/RP0RSP0/CPU0:router:hostname(config)# ipv4 access-list peer_acl_10
RP/0/RP0RSP0/CPU0:router:hostname(config-ipv4-acl)# permit 10.1.1.1
RP/0/RP0RSP0/CPU0:router:hostname(config-ipv4-acl)# permit 10.2.2.2

RP/0/RP0RSP0/CPU0:router:hostname(config)# ipv4 access-list peer_acl_20
RP/0/RP0RSP0/CPU0:router:hostname(config-ipv4-acl)# permit 20.1.1.1

RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# label advertise
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp-lbl-advt)# for pfx_acl_10 to peer_acl_10
RP/0/RP0RSP0/CPU0:router:hostname(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 POS 0/1/0/0:

```
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# label advertise
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp-lbl-advt)# interface POS 0/1/0/0
```

Related Commands

Command	Description
show mpls ldp neighbor, on page 107	Displays information about LDP neighbors.
show mpls ldp bindings, on page 86	Displays information about LDP label bindings.

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**}

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 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.7.2	This command was introduced.
Release 3.8.0	No modification.
Release 3.9.0	The **host-routes** keyword was added.

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/RP0RSP0/CPU0:router:hostname(config)# ipv4 access-list pfx_acl_1
RP/0/RP0RSP0/CPU0:router:hostname(config-ipv4-acl)# permit 192.168.1.1
RP/0/RP0RSP0/CPU0:router:hostname(config-ipv4-acl)# permit 192.168.2.2
RP/0/RP0RSP0/CPU0:router:hostname(config-ipv4-acl)# permit 192.168.3.3

RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# label allocate for pfx_acl_1
```

Related Commands

Command	Description
show mpls ldp bindings, on page 86	Displays information about LDP label bindings.
show mpls ldp forwarding, on page 97	Displays the contents of the LDP forwarding database.

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

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 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.7.2	This command was introduced.
Release 3.8.0	No modification.
Release 3.9.0	No modification.

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/RP0RSP0/CPU0:router:hostname(config-ldp)# log graceful-restart
```

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

```
RP/0/RP0RSP0/CPU0:router:hostname: mpls_ldp[340]: %ROUTING-LDP-5-GR : GR session 4.4.4.4:0
 (instance 1) disconnected

RP/0/RP0RSP0/CPU0:router:hostname: mpls_ldp[340]: %ROUTING-LDP-5-GR : GR session 4.4.4.4:0
 (instance 2) reconnected

RP/0/RP0RSP0/CPU0:router:hostname: mpls_ldp[340]: %ROUTING-LDP-5-GR : GR session 5.5.5.5:0
 (instance 3) timed out

RP/0/RP0RSP0/CPU0:router:hostname: mpls_ldp[336]: %ROUTING-LDP-5-GR_RESTART_COMPLETE : GR
forwarding state hold timer has expired
```

Related Commands

Command	Description
show mpls ldp neighbor, on page 107	Displays information about LDP neighbors.
show mpls ldp graceful-restart, on page 100	Displays information about LDP GR sessions.

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

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 3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.7.2	This command was introduced.
Release 3.8.0	No modification.
Release 3.9.0	No modification.

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/RP0RSP0/CPU0:router:hostname(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/RP0RSP0/CPU0:router:hostname:10 21:11:32.111:mpls_ldp[113]:%LDP-5-NBR_CHANGE: Nbr
10.44.44.44:0, DOWN
```

Related Commands

Command	Description
show mpls ldp neighbor, on page 107	Displays information about LDP neighbors.

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

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 3.7.0	No modification.
Release 3.7.2	This command was introduced.
Release 3.8.0	No modification.
Release 3.9.0	No modification.

Task ID

Task ID	Operations
mpls-ldp	read, write

Examples

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

```
RP/0/RP0RSP0/CPU0:router:hostname(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

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 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.
Release 3.7.2	This command was introduced.
Release 3.8.0	No modification.
Release 3.9.0	No modification.

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/RP0RSP0/CPU0:router:hostname(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/RP0RSP0/CPU0:router:hostname: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/RP0RSP0/CPU0:router:hostname:Apr 21 12:18:04.987:
mpls_ldp[315]:%ROUTING-LDP-5-SESSION_PROTECTION: Session recovery succeeded for peer 4.4.4.4:0
```

Related Commands

Command	Description
show mpls ldp neighbor, on page 107	Displays information about LDP neighbors.

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* | **duplicate-mitigation** *delay*]

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.
duplicate-mitigation *delay*	(Optional) Activate new LSP after de-activating the old LSP during MBB session. The delay timer (0–50 milliseconds) specifies the switchover interval between the old and new LSPs.

Command Default

No default behavior or values

Command Modes

MPLS LDP MLDP configuration

Command History

Release	Modification
Release 26.1.1	The **duplicate-mitigation** keyword is introduced.
Release 5.1.1	This command was introduced.

Task ID

Task ID	Operation
mpls-ldp	read, write

Example

The following example shows how to enable MLDP MBB support:

```
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp-mldp)# address-family ipv4 make-before-break
```

The following example shows how to configure duplicate-mitigation delay timer of 10 milliseconds to control the switchover interval between the old and new LSPs.

```
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp-mldp)# address-family ipv4
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp-mldp-af)# make-before-break delay 60
duplicate-mitigation 10
```

mldp disable

To disable Multicast Label Distribution Protocol (MLDP) on Label Distribution Protocol (LDP) enabled interfaces, use **mldp disable** command in MPLS LDP configuration mode.

interface *type* *interface-path-id* **address-family** {**ipv4** | **ipv6**} **igp mldp disable**

Syntax Description

interface *type*	Interface type. For more information, use the question mark (?) online help function.
interface-path-id	Physical interface or a virtual interface. **Note** Use the **show interfaces** command to see a list of all possible interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.

Command Default

No default behavior or values

Command Modes

MPLS LDP configuration

Command History

Release	Modification
Release 5.1.1	This command was introduced.

Task ID

Task ID	Operation
mpls-ldp	read

Example

The following example shows how to disable MLDP on a LDP enabled interface:

```
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp-if-af)# igp mldp disable
```

mldp logging notifications

To enable Multicast Label Distribution Protocol (MLDP) system log notifications, use the **mldp logging notifications** command in MPLS LDP MLDP configuration mode. To disable this function, use the **no** form of this command.

mldp logging notifications

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values

Command Modes

MPLS LDP MLDP configuration

Command History

Release	Modification
Release 5.1.1	This command was introduced.

Task ID

Task ID	Operation
mpls-ldp	read

Example

The following example shows how to enable MLDP system log notifications:

```
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# mldp logging notifications
```

mofrr (MPLS-LDP)

To enable Multicast Label Distribution Protocol (MLDP) multicast only fast reroute (MoFRR) support, use **mofrr** command in MPLS LDP MLDP configuration.

address-family ipv4 mofrr [**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 5.1.1	This command was introduced.

Task ID

Task ID	Operation
mpls-ldp	read

Example

The following example shows how to enable MLDP MoFRR support:

```
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp-mldp)# address-family ipv4 mofrr
```

mpls ldp

To enter MPLS Label Distribution Protocol (LDP) configuration mode, use the **mpls ldp** command in Global Configuration modeXR Config mode.

mpls ldp

Syntax Description This command has no arguments or keywords.

Command Default No default behavior or values

Command Modes Global Configuration modeXR Config mode

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Task ID

Task ID	Operations
mpls-ldp	read, write

Examples The following example shows how to MPLS LDP configuration mode:

```
RP/0/RP0RSP0/CPU0:router:hostname# configure
RP/0/RP0RSP0/CPU0:router:hostname(config)# mpls ldp
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)
```

mpls lsd app-reg-delay disable

Allows LDP to allocate labels with out any delay if segment routing will not be configured. By default, MPLS Label Switching Database (LSD) waits for segment routing enabled IGPs to allocate labels first because of their global significance. LSD allows LDP to allocate labels only after segment routing enabled IGPs complete label allocation. If segment routing will not be configured, this leads to additional delay and may cause traffic drops after router reload. This command avoids the delay in label allocation.

mpls lsd app-reg-delay disable

This command has no arguments or keywords.

Command Default:

No default behavior or values

Command Modes:

Global Configuration modeXR Config mode

Release	Modification
Release 5.3.3	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID	Operations
mpls-ldp	read, write

The following example shows how to configure **mpls lsd app-reg-delay disable** command:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# mpls lsd app-reg-delay disable
```

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 6.0	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/RP0RSP0/CPU0:router:hostname# configure
RP/0/RP0RSP0/CPU0:router:hostname(config)# mpls ldp
RP/0/RP0RSP0/CPU0:router:hostname(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 5.3.0	This command was introduced.

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 5.3.0	This command was introduced.

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
 3.3.3.3
```

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

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.
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 3.7.2	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:

```
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# neighbor 10.20.20.20:0 password clear abc
```

Related Commands

Command	Description
neighbor targeted, on page 75	Configures transmission of targeted hellos towards a neighbor.

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 3.7.2	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/RP0RSP0/CPU0:router:hostname(config-ldp)# neighbor 10.20.20.20 password disable abc
RP/0/RP0RSP0/CPU0:router:hostname(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 {} **neighbor** *IP address* **targeted**
no address-family {} **neighbor** *IP address* **targeted**

Syntax Description

IP address	Neighbor IP address.

Command Default

No default behavior or values

Command Modes

MPLS LDP configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

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/RSP0/CPU0:router(config-ldp)# neighbor 200.1.1.1 targeted
```

Related Commands

Command	Description
neighbor password, on page 72	Configures password authentication using MD5.
show mpls ldp neighbor, on page 107	Displays information about LDP neighbors.
show mpls ldp discovery, on page 93	Displays information about LDP discovery sources.

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 3.7.2	This command was introduced.

Usage Guidelines

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

- Route Switch Processor (RSP) switchover
- 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/RP0RSP0/CPU0:router:hostname# configure
RP/0/RP0RSP0/CPU0:router:hostname(config)# mpls ldp
RP/0/RP0RSP0/CPU0:router:hostname(config-ldp)# nsr
```

Related Commands

Command	Description
nsr process-failures switchover	Configures switchover as a recovery action for active instances to switch over to a standby RP or a DRP, to maintain NSR. For more information, see *Cisco ASR 9000 Series Aggregation Services Router IP Addresses and Services Command Reference* .
show mpls ldp neighbor, on page 107	Displays standby node specific information.

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 6.0	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/RP0RSP0/CPU0:router:hostname(config-ldp-mldp)# address-family ipv4 recursive-fec
```

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.

router-id *lsr-id*
no router-id

Syntax Description

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 3.7.2	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/RP0RSP0/CPU0:router:hostname(config-ldp)#router-id 10.0.0.1
```

Related Commands

Command	Description
show mpls ldp discovery, on page 93	Displays the status of the LDP discovery process.
show mpls ldp neighbor, on page 107	Displays information about LDP neighbors.
show mpls ldp parameters, on page 117	Displays current LDP parameter settings.

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 Global Configuration modeXR 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. **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.
sync	Enables LDP IGP synchronization on the specified interface.

disable	(Optional) Disables MPLS LDP synchronization.

Command Default

No default behavior or values

Command Modes

Global Configuration modeXR Config mode

Command History

Release	Modification
Release 5.1.1	This command was introduced.

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/RP0RSP0/CPU0:router:hostname# configure
RP/0/RP0RSP0/CPU0:router:hostname(config)#router ospf 109
RP/0/RP0RSP0/CPU0:router:hostname(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 3.7.2	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/RP0RSP0/CPU0:router:hostname(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/RP0RSP0/CPU0:router:hostname(config-ldp)# session protection for peer_acl duration 30
```

Related Commands

Command	Description
show mpls ldp neighbor, on page 107	Displays information about LDP neighbors.

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 EXEC modeXR EXEC mode.

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

Syntax Description

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

EXEC modeXR EXEC mode

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	The **location** and **standby** keywords were added.

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/RP0RSP0/CPU0:router:hostname# 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.

Related Commands

Command	Description
#unique_67	Configures LDP backoff parameters.
show mpls ldp forwarding, on page 97	Displays the contents of MPLS forwarding table.
show mpls ldp bindings, on page 86	Displays the contents of LDP LIB.

show mpls ldp bindings

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

show mpls ldp [] **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**]

Syntax Description

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.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	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/RP0RSP0/CPU0:router:hostname# 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/RP0RSP0/CPU0:router:hostname# 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/RP0RSP0/CPU0:router:hostname# 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.

[1] Label switched routers.

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

```
RP/0/RP0RSP0/CPU0:router:hostname# 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.

Field	Description
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/RP0RSP0/CPU0:router:hostname# 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.
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/RP0RSP0/CPU0:router:hostname# show mpls ldp bindings brief

  Prefix               Local Advertised Remote Bindings
                       Label (peers)         (peers)
  ------------------ -------- ---------- ---------------
  10.1.2.2/32           -          0           1
  10.2.3.4/32           16010      396         0
  209.165.201.1/32           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/RP0RSP0/CPU0:router:hostname# 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/RP0RSP0/CPU0:router:hostname# 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
```

Related Commands

Command	Description
label accept, on page 49	Configures the LDP remote label acceptance.
label advertise, on page 51	Configures the LDP local label advertisement control.
show mpls ldp neighbor, on page 107	Displays information on the LDP neighbors.
show mpls ldp forwarding, on page 97	Displays the contents of the LDP forwarding database.

show mpls ldp capabilities

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

EXEC modeXR EXEC mode

Command History

Release	Modification
Release 6.0	This command was introduced

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
mpls-ldp	read

Example

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

```
RP/0/RP0RSP0/CPU0:router:hostname# 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 EXEC modeXR EXEC mode.

show mpls ldp [] **discovery** [*type* *interface-path-id* | **brief** | **link** | **targeted** | **summary** [**all**]] [**detail**] [**location** *node-id* | **standby**]

Syntax Description

type	(Optional) Interface type. For more information, use the question mark (?) online help function.
interface-path-id	Physical interface or a virtual interface. **Note** Use the **show interfaces** command to see a list of all possible interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
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.
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 EXEC modeXR EXEC mode

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	The following items were added: • The **link** keyword was added. • The **targeted** keyword was added.

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/RP0RSP0/CPU0:router:hostname# show mpls ldp discovery

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

Field	Description
Interfaces	Interfaces engaged in LDP discovery activity, as follows: **xmit field** Indicates that the interface is transmitting LDP discovery hello packets. **recv field** indicates that the interface is receiving LDP discovery hello packets. 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/RP0RSP0/CPU0:router:hostname# 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.
Interfaces	Summary of interfaces engaged in LDP activity. **Configured** Number of interfaces configured for LDP. **Enabled** 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.

Field	Description
Discovery	Summary of LDP discovery process. **Hello xmit** Number of local LDP discovery sources (including link and targeted hellos) emitting LDP hellos. **Hello recv** 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/RP0RSP0/CPU0:router:hostname# 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
```

Related Commands

Command	Description
#unique_69	Configures LDP link hello parameters.
#unique_20	Configures LDP targeted-hello parameters.
neighbor targeted, on page 75	Configures LDP targeted neighbor.
session protection, on page 82	Configures LDP session protection.
interface (MPLS LDP), on page 46	Configures LDP on an interface.
show mpls ldp neighbor, on page 107	Displays information about LDP neighbors.

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 EXEC mode.

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

Syntax Description

prefix	(Optional) Destination prefix, written in A.B.C.D format.
length	(Optional) Network mask length, in bits. Range is 0 to 32.
local-label *label-value*	(Optional) Displays the prefix with the specified local label. Range is from 0 to 1048575.
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

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	The following items were added: • The **detail** keyword. • Sample output for the **detail** keyword. • The **local-label** keyword. • The **location** keyword. • The **standby** keyword.

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:

```
RP/0/RP0RSP0/CPU0:router:hostname# show mpls ldp forwarding

  Prefix             Label Label      Outgoing     Next Hop        GR Stale
                     In    Out        Interface
  ------------------ ----- ---------- ------------ --------------- -- -----
  172.16.0.1/32         22    ImpNull    PO0/2/0/1      12.0.0.2        N  N
  3.0.0.1/32         24    20         PO0/2/0/1      12.0.0.2        N  N
  3.0.0.2/32         25    21         PO0/2/0/1      12.0.0.2        N  N
  3.0.0.3/32         26    22         PO0/2/0/1      12.0.0.2        N  N
  4.4.4.4/32         20    ExpNullv4  tt10           4.4.4.4         N  N
  4.4.4.5/32         21    ExpNullv4  tt10           4.4.4.4         N  N
  123.0.0.0/24       23    ImpNull    PO0/2/0/1      12.0.0.2        N  N
  192.168.0.1/32       16000   16001      PO0/2/0/3.1  131.1.1.4         Y  N
                       16002      PO0/2/0/3.2  131.1.2.4         Y  N
                       16003      PO0/2/0/3.3  131.1.3.4         N  N
                       16002      PO0/2/0/1    192.11.1.1 (!)    Y  N
                       Unlabelled PO0/2/0/2    192.11.2.1 (!)    N  N
```

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/RP0RSP0/CPU0:router:hostname# show mpls ldp forwarding 10.0.0.1/32 detail

  Prefix           Label   Label      Outgoing     Next Hop        GR Stale
                   In      Out        Interface
  ---------------- ------- ---------- ------------ --------------- -- -----
  192.168.0.1/32       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 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.

[2] Forwarding Equivalence Class.

Related Commands

Command	Description
graceful-restart (MPLS LDP), on page 32	Configures the LDP graceful restart feature.
show mpls ldp bindings, on page 86	Displays the contents of LDP LIB.

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 EXEC mode.

show mpls ldp graceful-restart [**location** *node-id*] [**standby**]

Syntax Description

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

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	The **location** and **standby** keywords were added.

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/RP0RSP0/CPU0:router:hostname# 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.

Field	Description
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.

Related Commands

Command	Description
graceful-restart (MPLS LDP), on page 32	Configures the LDP graceful restart feature.
show mpls ldp neighbor, on page 107	Displays information about LDP neighbors.

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 EXEC mode.

show mpls ldp [] **igp sync** [**interface** *type* *interface-path-id*] [**location** *node-id*] [**standby**]

Syntax Description

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. **Note** Use the **show interfaces** command to see a list of all possible interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
location *node-id*	(Optional) Displays location information for the specified node ID.
standby	(Optional) Displays standby node-specific information.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	The **location** and **standby** keywords were added.

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/RP0RSP0/CPU0:router:hostname# 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.
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.

Related Commands

Command	Description
igp sync delay, on page 40	Configures LDP IGP sync delay timeout.

show mpls ldp interface

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

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

Syntax Description

type	(Optional) Interface type. For more information, use the question mark (?) online help function.
interface-path-id	Physical interface or a virtual interface. **Note** Use the **show interfaces** command to see a list of all possible interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
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

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	The **location** and **standby** keywords were added.

Task ID

Task ID	Operations
mpls-ldp	read

Examples

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

```
RP/0/RP0RSP0/CPU0:router:hostname# 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: **OSPF** *ospf instance area* **ISIS** *isis instance*

Related Commands

Command	Description
igp auto-config disable, on page 39	Disables LDP auto-configuration.

show mpls ldp neighbor

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

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

Syntax Description

ip-address	(Optional) Neighbor IP address.
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.
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 EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	The following items were added: • The **location** keyword was added. • Sample output for the **brief** keyword was modified to add the NSR and IPv4 Label columns.

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/RP0RSP0/CPU0:router:hostname# 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/RP0RSP0/CPU0:router:hostname# 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: **neighbor IP address** peer port **local IP address** 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.
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/RP0RSP0/CPU0:router:hostname# 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/RP0RSP0/CPU0:router:hostname# 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: **neighbor IP address** peer port **local IP address** 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.
Session Protection	State of the session protection: **Incomplete** Targeted discovery requested but not yet up. **Ready** Targeted discovery and at least one link hello adjacency to the peer are up. **Protecting** 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.

Field	Description
Holdtimer	When in “protecting” state, time to keep LDP peer session up without receipt of LDP protocol message from a peer.

Related Commands

Command	Description
graceful-restart (MPLS LDP), on page 32	Configures the LDP graceful restart feature.
label accept, on page 49	Configures the LDP inbound label filtering feature.
session protection, on page 82	Configures the LDP session protection feature.
show mpls ldp discovery, on page 93	Displays the status of the LDP discovery process.

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 EXEC modeXR 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

EXEC modeXR EXEC mode

Command History

Release	Modification
Release 5.1.1	This command was introduced.

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/RP0RSP0/CPU0:router:hostname# 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 EXEC modeXR 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

EXEC modeXR EXEC mode

Command History

Release	Modification
Release 5.1.1	This command was introduced.

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/RP0RSP0/CPU0:router:hostname# 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 EXEC modeXR 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

EXEC modeXR EXEC mode

Command History

Release	Modification
Release 5.1.1	This command was introduced.

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/RP0RSP0/CPU0:router:hostname# 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 EXEC mode.

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

Syntax Description

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

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	The **location** and **standby** keywords were added.
Release 24.3.1	This command displays the NHID option for UDP sockets is enabled for LDP control packets.

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/RP0RSP0/CPU0:router:hostname# 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
```

From Cisco IOS XR Release 24.3.1 onwards, the **show mpls ldp parameters** displays the NHID option for UDP sockets is enabled for LDP control packets.

Example:

```
Router#show mpls ldp parameters
LDP Parameters:
  Role: Active
  Protocol Version: 1
  Router ID: 37.0.0.1
  Null Label:
    IPv4: Implicit
  Session:
    Hold time: 180 sec
    Keepalive interval: 60 sec
    Backoff: Initial:15 sec, Maximum:120 sec
    Global MD5 password: Disabled
  Discovery:
    Link Hellos:     Holdtime:15 sec, Interval:5 sec
    Targeted Hellos: Holdtime:45 sec, Interval:15 sec
                     Accepting:
                       IPv4: all;
    Quick-start: Enabled (by default)
    Transport address:
      IPv4: 37.0.0.1
  Graceful Restart:
    Enabled
    Reconnect Timeout:120 sec, Forwarding State Holdtime:180 sec
  NSR: Enabled, Not Sync-ed
  Timeouts:
    Housekeeping periodic timer: 10 sec
    Local binding: 300 sec
    Forwarding state in LSD: 360 sec
  Delay in AF Binding Withdrawl from peer: 180 sec
  Max:
    5000 interfaces (4000 attached, 1000 TE tunnel), 2000 peers
  OOR state
    Memory: Normal
  IGP sync delay:
    Interface up: 60 sec
  MPLS NHID Support: Yes
```

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.

Field	Description
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: • 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*. • 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.

Related Commands

Command	Description
#unique_67	Configures the parameters for the LDP backoff mechanism.
#unique_69	Configures the interval between transmission of LDP discovery messages.
explicit-null, on page 29	Configures a router to advertise an explicit-null label.
graceful-restart (MPLS LDP), on page 32	Configures the LDP graceful restart feature.
session holdtime (MPLS LDP), on page 35	Configures keepalive message hold time for LDP sessions.
neighbor targeted, on page 75	Specifies the preferred interface or IP address of a Loopback interface for determining the LDP router ID.

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 EXEC modeXR EXEC mode.

show mpls ldp [**vrf** *vrf-name*] **statistics fwd-setup** [**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

EXEC modeXR EXEC mode

Command History

Release	Modification
Release 5.1.1	This command was introduced.

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/RP0RSP0/CPU0:router:hostname# 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 EXEC mode.

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

Syntax Description

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

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	The **location** and **standby** keywords were added.

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/RP0RSP0/CPU0:router:hostname# 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
```

Table 15: show mpls ldp statistics msg-counters Command Field Descriptions, on page 123 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.

Related Commands

Command	Description
#unique_74	Clears MPLS LDP message counter values.
show mpls ldp bindings, on page 86	Displays the contents of LDP LIB.
show mpls ldp neighbor, on page 107	Displays LDP neighbor information.

show mpls ldp summary

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

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

Syntax Description

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

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	The **location** and **standby** keywords were added.

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/RP0RSP0/CPU0:router:hostname# 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/RP0RSP0/CPU0:router:hostname# 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.

Related Commands

Command	Description
show mpls ldp bindings, on page 86	Displays the contents of LDP LIB.
show mpls ldp discovery, on page 93	Displays the status of the LDP discovery process.
show mpls ldp forwarding, on page 97	Displays the contents of the LDP forwarding database.
show mpls ldp graceful-restart, on page 100	Displays the status of the LDP graceful restart.
show mpls ldp parameters, on page 117	Displays current LDP parameter settings.

show mpls ldp trace vrf

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

EXEC modeXR EXEC mode

Command History

Release	Modification
Release 5.1.1	This command was introduced.

Task ID

Task ID	Operation
mpls-ldp	read

Example

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

```
RP/0/RP0RSP0/CPU0:router:hostname# show mpls ldp trace vrf
```

show mpls mldp database

To display Multicast Label Distribution Protocol (MLDP) information, use the **show mpls mldp database**command in user EXEC or privileged EXEC mode.

show mpls mldp database [**id** *id*] [**opaque_type** *type*] [**detail**] [**summary**]

Syntax Description

id *id*	(Optional) The Label Switched Multicast (LSM) ID whose MLDP entry is to be displayed.
opaque_type *type*	(Optional) The opaque type to be used for filtering. The following types are supported: • **ipv4** *source-group* --this represents the "IPv4 Protocol Independent Source-Specific Transit" multicast application type. The IPv4 source address and group address are also specified. • **ipv6** *source-group* --this represents the "IPv6 Protocol Independent Source-Specific Transit" multicast application type.The IPv6 source address and group address are also specified. • **mdt** *vpn-id mdt-number* --this represents the "Multicast Virtual Private Network (MVPN)" multicast application type. The VPN identifier and the Multicast Distribution Tree (MDT) number are also specified. • **vpnv4** *source-group route-distinguisher* --this represents the "Direct MDT (VPNv4) " multicast application type.The IPv4 source address, group address, and the VPN route distinguisher are also specified. • **vpnv6** *source-group route-distinguisher*—this represents the "Direct MDT (VPNv6)" multicast application type. The IPv6 source address, group address, and the VPN route distinguisher are also specified. • *type-number* --the type-number. Valid values are from 0-65535.
detail	(Optional) Displays detailed database information for an MLDP session.
summary	(Optional) The MLDP database summary.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
Release 6.0	This command was introduced.

Usage Guidelines

This command displays the contents for MLDP entries in the MLDP database. Each MLDP entry provides the configuration details associated with each point-to-multipoint (P2MP) and multipoint-to-multipoint (MP2MP) Label Switched Path (LSP) used to transmit multicast traffic within an MPLS core network.

Examples

The following is sample output from the **show mpls mldp database**command.

```
Router# show mpls mldp database opaque_type mdt 100:2
* Indicates MLDP recursive forwarding is enabled
LSM ID : D3000001 (RNR LSM ID: 8A000002)   Type: MP2MP   Uptime : 00:04:54
  FEC Root           : 172.30.20.1
  Opaque decoded     : [mdt 100:2 0]
  Opaque length      : 11 bytes
  Opaque value       : 07 000B 00000100000000100000000
  RNR active LSP     : (this entry)
  Upstream client(s) :
    172.30.20.1:0    [Active]
      Expires        : Never         Path Set ID  : 99000001
      Out Label (U)  : 32            Interface    : Ethernet1/0*
      Local Label (D): 30            Next Hop     : 10.0.1.7
  Replication client(s):
    MDT  (VRF blue)
      Uptime         : 00:04:54      Path Set ID  : 5000002
      Interface      : Lspvif0
```

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

Table 17: show mpls mldp database Field Descriptions

Field	Description
LSM ID	The LSM ID whose MLDP entry is displayed.
Type	The type of LSP used. This can P2MP or MP2MP.
FEC Root	The root of the MDT.
Opaque value	A value which is used to uniquely identify the MP LSP.
RNR active LSP	The primary root for upstream forwarding.
Upstream client(s)	The upstream clients are the upstream nodes of the MP2MP LSP.
Replication client(s)	The Replication Clients are the downstream nodes of the MP2MP LSP. They receive multipoint replicated traffic.

Related Commands

Command	Description
show mpls mldp bindings	Displays the bindings (the upstream and downstream label assignments) for MLDP traffic.

show lcc

To display label consistency checker (LCC) information, use the **show lcc** command in EXEC 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 4.2.0	This command was introduced.

Task ID

Task ID	Operations
IPv4	read
IPv6	read

Examples

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

```
RP/0/RP0RSP0/CPU0:router:hostname# 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
```

Related Commands

Command	Description
show rcc	Displays route consistency checker related information.

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 3.7.2	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/RP0RSP0/CPU0:router:hostname(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

Global configuration

Command History

Release	Modification
Release 3.7.2	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/RP0RSP0/CPU0:router:hostname(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 5.1.1	This command was introduced.

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/RP0RSP0/CPU0:router:hostname(config-ldp-mldp)# address-family ipv4 static mp2mp 10.0.0.1
 45
```

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** {}
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

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 5.1.1	This command was introduced.

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/RP0RSP0/CPU0:router:hostname(config-ldp)# address-family ipv4 label
```