ZebOS-XP®
Network Platform

Version 1.4
Extended Performance

Label Distribution Protocol
Command Reference

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Contents

Preface

This document describes the ZebOS-XP commands for Label Distribution Protocol (LDP).

Audience

This document is intended for network administrators and other engineering professionals who configure and manage LDP.

Conventions

Table P-1 shows the conventions used in this guide.

Table P-1: Conventions

Convention	Description
Italics	Emphasized terms; titles of books
Note:	Special instructions, suggestions, or warnings
`monospaced type`	Code elements such as commands, functions, parameters, files, and directories

Contents

This document contains these chapters and appendices:

- Chapter 1, *Command Line Interface*
- Chapter 2, *LDP Commands*
- Chapter 3, *LDP Show Commands*

Related Documents

The following guides are related to this document:

- *Label Distribution Protocol Developer Guide*
- *Installation Guide*

Note: All ZebOS-XP technical manuals are available to licensed customers at http://www.ipinfusion.com/support/document_list.

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CHAPTER 1 Command Line Interface

This chapter introduces the ZebOS-XP Command Line Interface (CLI) and how to use its features.

Overview

You use the CLI to configure, monitor, and maintain ZebOS-XP devices. The CLI is text-based and each command is usually associated with a specific task.

You can give the commands described in this manual locally from the console of a device running ZebOS-XP or remotely from a terminal emulator such as `putty` or `xterm`. You can also use the commands in scripts to automate configuration tasks.

Starting the Command Line Interface

You must start daemons as described in this section before you can use the CLI. The general steps are listed below. For details about the ZebOS-XP daemons, see the *Installation Guide.*

1. Start your terminal emulator and connect to the device or go to the console of the device running ZebOS-XP.
2. Connect to the directory where you installed the ZebOS-XP executables.
3. Start the Network Services Module (NSM).
   ```
   # ./nsm -d
   ```
4. Start the protocol module daemons that your organization uses, such as `mstpd`, `ospf6d`, or `ripd`.
   ```
   # ./mstpd -d
   ```
5. Start the Integrated Management Interface (IMI) daemon.
   ```
   # ./imi -d
   ```
6. Start the IMI shell.
   ```
   # ./imish
   ```
   Note: Your organization may use a ZebOS-XP build that does not include `imish`. If that is the case, you must connect to a port on which a protocol daemon is listening. For details, see the *Installation Guide.*

You can now begin using the CLI.

Command Line Interface Help

You access the CLI help by entering a full or partial command string and a question mark “?”. The CLI displays the command keywords or parameters along with a short description. For example, at the CLI command prompt, type:

```
> show ?
```

The CLI displays this keyword list with short descriptions for each keyword:

```
show ?
  application-priority            Application Priority
```

```
  arp                              Internet Protocol (IP)
  bfd                              Bidirectional Forwarding Detection (BFD)
  bgp                              Border Gateway Protocol (BGP)
  bi-lsp                           Bi-directional lsp status and configuration
  bridge                           Bridge group commands
  ce-vlan                          COS Preservation for Customer Edge VLAN
  class-map                        Class map entry
  cli                              Show CLI tree of current mode
  clns                             Connectionless-Mode Network Service (CLNS)
  control-adjacency                Control Adjacency status and configuration
  control-channel                  Control Channel status and configuration
  cspf                             CSPF Information
  customer                         Display Customer spanning-tree
  cvlan                            Display CVLAN information
  debugging                        Debugging functions (see also 'undebug')
  dot1x                            IEEE 802.1X Port-Based Access Control
  etherchannel                     LACP etherchannel
  ethernet                         Layer-2
...
```

If you type the ? in the middle of a keyword, the CLI displays help for that keyword only.

```
> show de?
debugging  Debugging functions (see also 'undebug')
```

If you type the ? in the middle of a keyword, but the incomplete keyword matches several other keywords, ZebOS-XP displays help for all matching keywords.

```
> show i? (CLI does not display the question mark).
interface  Interface status and configuration
ip         IP information
isis       ISIS information
```

Command Completion

The CLI can complete the spelling of a command or a parameter. Begin typing the command or parameter and then press the tab key. For example, at the CLI command prompt type `sh`:

```
> sh
```

Press the tab key. The CLI displays:

```
> show
```

If the spelling of a command or parameter is ambiguous, the CLI displays the choices that match the abbreviation. Type `show i` and press the tab key. The CLI displays:

```
> show i
  interface  ip         ipv6       isis
> show i
```

The CLI displays the `interface` and `ip` keywords. Type `n` to select `interface` and press the tab key. The CLI displays:

```
> show in
> show interface
```

Type ? and the CLI displays the list of parameters for the `show interface` command.

```
> show interface
  IFNAME  Interface name
  |       Output modifiers
```



```
>       Output redirection
<cr>
```

The CLI displays the only parameter associated with this command, the `IFNAME` parameter.

Command Abbreviations

The CLI accepts abbreviations that uniquely identify a keyword in commands. For example:

```
> sh in eth0
```

is an abbreviation for:

```
> show interface eth0
```

Command Line Errors

Any unknown spelling causes the CLI to display the error `Unrecognized command` in response to the ?. The CLI displays the command again as last entered.

```
> show dd?
% Unrecognized command
> show dd
```

When you press the Enter key after typing an invalid command, the CLI displays:

```
(config)#router ospf here
                          ^
% Invalid input detected at '^' marker.
```

where the ^ points to the first character in error in the command.

If a command is incomplete, the CLI displays the following message:

```
> show
% Incomplete command.
```

Some commands are too long for the display line and can wrap mid-parameter or mid-keyword, as shown below. This does *not* cause an error and the command performs as expected:

```
area 10.10.0.18 virtual-link 10.10.0.19 authent
ication-key 57393
```

Command Negation

Many commands have a `no` form that resets a feature to its default value or disables the feature. For example:

- The `ip address` command assigns an IPv4 address to an interface
- The `no ip address` command removes an IPv4 address from an interface

Syntax Conventions

Table 1-1 describes the conventions used to represent command syntax in this reference.

Table 1-1: Syntax conventions

Convention	Description	Example
`monospaced font`	Command strings entered on a command line	`show debugging ldp`
`lowercase`	Keywords that you enter exactly as shown in the command syntax.	`show debugging ldp`
`UPPERCASE`	See Variable Placeholders	`IFNAME`
`()`	Optional parameters, from which you must select one. Vertical bars delimit the selections. Do not enter the parentheses or vertical bars as part of the command.	`(A.B.C.D|<0-4294967295>)`
`()`	Optional parameters, from which you select one or none. Vertical bars delimit the selections. Do not enter the parentheses or vertical bars as part of the command.	`(A.B.C.D|<0-4294967295>|)`
`()`	Optional parameter which you can specify or omit. Do not enter the parentheses or vertical bar as part of the command.	`(IFNAME|)`
`{}`	Optional parameters, from which you must select one or more. Vertical bars delimit the selections. Do not enter the braces or vertical bars as part of the command.	`{intra-area <1-255>|inter-area <1-255>|external <1-255>}`
`[]`	Optional parameters, from which you select zero or more. Vertical bars delimit the selections. Do not enter the brackets or vertical bars as part of the command. A '?' before a parameter in square brackets limits that parameter to one occurrence in a command string.	`[<1-65535>|AA:NN|internet|local-AS|no-advertise|no-export]`
`.`	Repeatable parameter. The parameter that follows a period can be repeated more than once. Do not enter the period as part of the command.	`set as-path prepend .<1-65535>`

Variable Placeholders

Table 1-2 shows the tokens used in command syntax use to represent variables for which you supply a value.

Table 1-2: Variable placeholders

Token	Description
`WORD`	A contiguous text string (excluding spaces)
`LINE`	A text string, including spaces; no other parameters can follow this parameter
`IFNAME`	Interface name whose format varies depending on the platform; examples are: `eth0`, `Ethernet0`, `ethernet0`, `xe0`
`A.B.C.D`	IPv4 address
`A.B.C.D/M`	IPv4 address and mask/prefix
`X:X::X:X`	IPv6 address
`X:X::X:X/M`	IPv6 address and mask/prefix
`HH:MM:SS`	Time format
`AA:NN`	BGP community value
`XX:XX:XX:XX:XX:XX`	MAC address

`<1-5>`
`<1-65535>`
`<0-2147483647>`
`<0-4294967295>`
	Numeric range

Command Description Format

Table 1-3 explains the sections used to describe each command in this reference.

Table 1-3: Command descriptions

Section	Description
Command Name	The name of the command, followed by what the command does and when should it be used
Command Syntax	The syntax of the command
Parameters	Parameters and options for the command
Default	The state before the command is executed
Command Mode	The mode in which the command runs; see Command Modes
Example	An example of the command being executed

Keyboard Operations

Table 1-4 lists the operations you can perform from the keyboard.

Table 1-4: Keyboard operations

Key combination	Operation
Left arrow or Ctrl+b	Moves one character to the left. When a command extends beyond a single line, you can press left arrow or Ctrl+b repeatedly to scroll toward the beginning of the line, or you can press Ctrl+a to go directly to the beginning of the line.
Right arrow or Ctrl-f	Moves one character to the right. When a command extends beyond a single line, you can press right arrow or Ctrl+f repeatedly to scroll toward the end of the line, or you can press Ctrl+e to go directly to the end of the line.
Esc, b	Moves back one word
Esc, f	Moves forward one word
Ctrl+e	Moves to end of the line
Ctrl+a	Moves to the beginning of the line
Ctrl+u	Deletes the line
Ctrl+w	Deletes from the cursor to the previous whitespace
Alt+d	Deletes the current word
Ctrl+k	Deletes from the cursor to the end of line
Ctrl+y	Pastes text previously deleted with Ctrl+k, Alt+d, Ctrl+w, or Ctrl+u at the cursor

Table 1-4: Keyboard operations (Continued)

Key combination	Operation
Ctrl+t	Transposes the current character with the previous character
Ctrl+c	Ignores the current line and redisplays the command prompt
Ctrl+z	Ends configuration mode and returns to exec mode
Ctrl+l	Clears the screen
Up Arrow or Ctrl+p	Scroll backward through command history
Down Arrow or Ctrl+n	Scroll forward through command history

Show Command Modifiers

You can use two tokens to modify the output of a `show` command. Enter a question mark to display these tokens:

```
# show users ?
  | Output modifiers
  > Output redirection
```

You can type the | (vertical bar character) to use output modifiers. For example:

```
> show rsvp | ?
  begin     Begin with the line that matches
  exclude   Exclude lines that match
  include   Include lines that match
  redirect  Redirect output
```

Begin Modifier

The `begin` modifier displays the output beginning with the first line that contains the input string (everything typed after the `begin` keyword). For example:

```
# show run | begin eth1
...skipping
interface eth1
 ipv6 address fe80::204:75ff:fee6:5393/64
!
interface eth2
 ipv6 address fe80::20d:56ff:fe96:725a/64
!
line con 0
 login
!
end
```

You can specify a regular expression after the `begin` keyword, This example begins the output at a line with either “eth3” or “eth4”:

```
# show run | begin eth[3-4]

...skipping
interface eth3
```

```
 shutdown
!
interface eth4
 shutdown
!
interface svlan0.1
 no shutdown
!
route-map myroute permit 3
!
route-map mymap1 permit 10
!
route-map rmap1 permit 3
!
line con 0
 login
line vty 0 4
 login
!
end
```

Include Modifier

The `include` modifier includes only those lines of output that contain the input string. In the output below, all lines containing the word “input” are included:

```
# show interface eth1 | include input
    input packets 80434552, bytes 2147483647, dropped 0, multicast packets 0
    input errors 0, length 0, overrun 0, CRC 0, frame 0, fifo 1, missed 0
```

You can specify a regular expression after the `include` keyword. This examples includes all lines with “input” or “output”:

```
#show int eth0 | include (in|out)put
    input packets 597058, bytes 338081476, dropped 0, multicast packets 0
    input errors 0, length 0, overrun 0, CRC 0, frame 0, fifo 0, missed 0
    output packets 613147, bytes 126055987, dropped 0
    output errors 0, aborted 0, carrier 0, fifo 0, heartbeat 0, window 0
```

Exclude Modifier

The `exclude` modifier excludes all lines of output that contain the input string. In the following output example, all lines containing the word “input” are excluded:

```
# show interface eth1 | exclude input
Interface eth1
  Scope: both
  Hardware is Ethernet, address is 0004.75e6.5393
  index 3 metric 1 mtu 1500 <UP,BROADCAST,RUNNING,MULTICAST>
  VRF Binding: Not bound
  Administrative Group(s): None
  DSTE Bandwidth Constraint Mode is MAM
  inet6 fe80::204:75ff:fee6:5393/64
    output packets 4438, bytes 394940, dropped 0
    output errors 0, aborted 0, carrier 0, fifo 0, heartbeat 0, window 0
    collisions 0
```

You can specify a regular expression after the `exclude` keyword. This example excludes lines with “output” or “input”:


```
# show interface eth0 | exclude (in|out)put
Interface eth0
  Scope: both
  Hardware is Ethernet  Current HW addr: 001b.2139.6c4a
  Physical:001b.2139.6c4a  Logical:(not set)
  index 2 metric 1 mtu 1500 duplex-full arp ageing timeout 3000
  <UP,BROADCAST,RUNNING,MULTICAST>
  VRF Binding: Not bound
  Bandwidth 100m
  DHCP client is disabled.
  inet 10.1.2.173/24 broadcast 10.1.2.255
  VRRP Master of :  VRRP is not configured on this interface.
  inet6 fe80::21b:21ff:fe39:6c4a/64
    collisions 0
```

Redirect Modifier

The `redirect` modifier writes the output into a file. The output is not displayed.

```
# show history | redirect /var/frame.txt
```

The output redirection token (>) does the same thing:

```
# show history >/var/frame.txt
```

Command Modes

Commands are grouped into modes arranged in a hierarchy. Each mode has its own set of commands. Table 1-5 lists the command modes common to all protocols.

Table 1-5: Common command modes

Name	Description
Executive mode	Also called *view* mode, this is the first mode to appear after you start the CLI. It is a base mode from where you can perform basic commands such as `show`, `exit`, `quit`, `help`, `list`, and `enable`.
Privileged executive mode	Also called *enable* mode, in this mode you can run additional basic commands such as `debug`, `write`, and `show`.
Configure mode	Also called *configure terminal* mode, in this mode you can run configuration commands and go into other modes such as interface, router, route map, key chain, and address family.
Interface mode	In this mode you can configure protocol-specific settings for a particular interface. Any setting you configure in this mode overrides a setting configured in router mode.
Router mode	This mode is used to configure router-specific settings for a protocol such as RIP or OSPF.

Command Mode Tree

The diagram below shows the common command mode hierarchy.

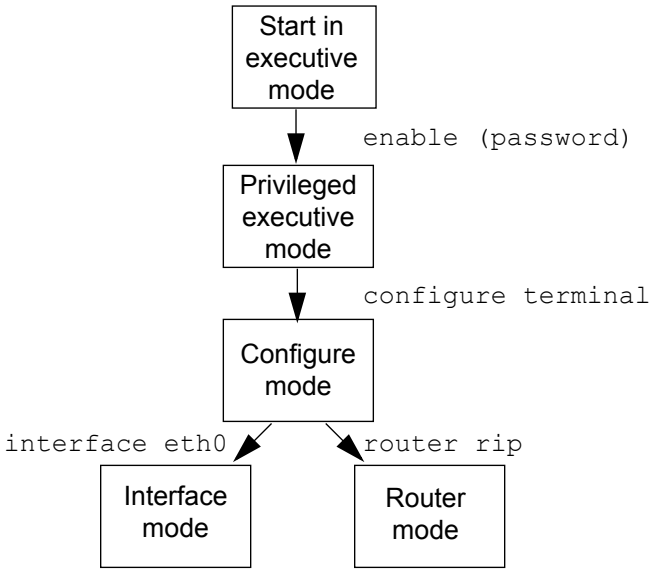

Figure 1-1: Common command modes

To change modes:

1. Enter privileged executive mode by entering `enable` in Executive mode.
2. Enter configure mode by entering `configure terminal` in Privileged Executive mode.

The example below shows starting `imish` and then moving from executive mode to privileged executive mode to configure mode and finally to router mode:

```
# ./imish
> enable mypassword
# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
(config)# router rip
(config-router)#
```

Note: Each protocol can have modes in addition to the common command modes. See the command reference for the respective protocol for details.

Debug Command

Whether the settings you make for a `debug` command persist between sessions depends on the mode where you make the settings:

- When you make settings for a `debug` command in executive mode, the configuration is valid for the current session only and is not saved in the `ZebOS.conf` file.
- When you make settings for a `debug` command in configuration mode, the configuration is retained and saved in `ZebOS.conf` and used even after the session restarts.

CHAPTER 2 LDP Commands

This chapter provides an alphabetized reference for each of the LDP commands. It includes the following commands:

advertise-labels

Use this command to prevent the distribution of any locally assigned labels.

Use the `no` parameter to enable the distribution of all locally assigned labels to all LDP neighbors.

Command Syntax

```
advertise-labels for any to none
advertise-labels for PREFIX_ACL to (PEER_ACL|any)
no advertise-labels for any to none
no advertise-labels for PREFIX_ACL to (PEER_ACL|any)
```

Parameters

`for`	Specify the permitted destinations
`any`	Specify to permit any locally assigned labels
`PREFIX_ACL`	Specify the destinations which have labels are advertised
`to`	Specify the given neighbor
`PEER_ACL`	Specify the LDP neighbors which receive these advertisements
`none`	Specify that there are no LDP neighbors

Default

The labels of all destinations are advertised to all LDP neighbors.

Command Mode

Router mode

Examples

```
#configure terminal
(config)#router ldp
(config-router)#advertise-labels for any to none

#configure terminal
(config)#router ldp
(config-router)#advertise-labels for PREFIX_ACL to any

#configure terminal
(config)#router ldp
(config-router)#advertise-labels for PREFIX_ACL to PEER_ACL
```

advertisement-mode

Use this command to set the label advertisement mode for all the interfaces for the current LSR. Specifying `downstream-on-demand` and `downstream-unsolicited` mode affects which LSR initiates mapping requests and mapping advertisements.

This command is a global command used to set the label advertisement mode for all interfaces for the current LSR. The advertisement mode set for a specific interface overrides the value set by this command (see ldp advertisement-mode). Use this command before starting the interface as it closes and restarts all sessions.

Use the `no` parameter to revert to the default advertisement mode value.

Command Syntax

```
advertisement-mode (downstream-on-demand|downstream-unsolicited)
no advertisement-mode (downstream-on-demand|downstream-unsolicited)
```

Parameters

`downstream-on-demand`

Sends label upon request. When a users uses this mode, a router distributes a label to a peer only if there is a pending label request from a peer. The reaction of the downstream router to this request depends on the label advertising mode supported on the next hop. This mode is typically used with the conservative label retention mode.

`downstream-unsolicited`

Sends label without waiting request. This mode distributes labels to peers without waiting for a label request, and is typically used with the liberal label retention mode.

Default

Downstream-unsolicited

Command Mode

Router mode

Example

In the following example, the LSR will use the downstream-unsolicited advertisement mode for an LDP session on its interfaces.

```
#configure terminal
(config)#router ldp
(config-router)#advertisement-mode downstream-unsolicited
```

clear ldp adjacency

Use this command to clear an adjacency with a specified peer, or to clear all adjacencies for the current LSR.

Command Syntax

```
clear ldp adjacency (A.B.C.D|*)
clear ldp adjacency (X:X::X:X|*)
```

Parameters

`*`	Specify to clear all adjacencies.
`A.B.C.D`	Specify to clear IPv4 address of the peer.
`X:X::X:X`	Specify to clear IPv6 address of the peer.

Command Mode

Privileged Exec mode

Example

```
#clear ldp adjacency 123.123.123.33
#clear ldp adjacency 3ffe::7
```

clear ldp session

Use this command to clear a session established with a specified peer, or to clear all sessions for the current LSR.

Command Syntax

```
clear ldp session (A.B.C.D|*)
clear ldp session (X:X::X:X|*)
```

Parameters

`*`	Specify to clear all sessions.
`A.B.C.D`	Specify to clear IPv4 address of the peer.
`X:X::X:X`	Specify to clear IPv6 address of the peer.

Command Mode

Privileged Exec mode

Example

```
#clear ldp session 123.123.123.33
#clear ldp session 3ffe::7
```

clear ldp statistics

Use this command to clear LDP statistics. This command clears the count per each operation filtered by an advertisement list.

Command Syntax

```
clear ldp statistics
```

Parameters

None

Command Mode

Privileged Exec mode

Example

```
#clear ldp statistics
```

clear ldp statistics advertise-labels

Use this command to clear LDP advertise-labels statistics. This command clears the count per each operation filtered by an advertisement list.

Command Syntax

```
clear ldp statistics advertise-labels
clear ldp statistics advertise-labels for PREFIX_ACL
clear ldp statistics advertise-labels for PREFIX_ACL to PEER_ACL
```

Parameters

`advertise-labels`	Specify the IP access list of advertise-labels.
`for`	Specify the permitted destinations.
`PREFIX_ACL`	Specify the destinations that have their labels advertised.
`to`	Specify the given neighbor.
`PEER_ACL`	Specify the LDP neighbors that receive these advertisements.

Command Mode

Privileged Exec mode

Example

```
#clear ldp statistics advertise-labels
```

control-mode

Use this command to set the control mode for label processing. Ordered processing sets the mode to strict chain-of-command; an LSR replies to a request packet from an LSR higher in the chain only after it receives a label from an LSR lower in the chain. Independent processing sets the mode to instant replies.

In independent control mode, each LSR might advertise label mappings to its neighbors at any time. In independent downstream-on-demand mode, an LSR might answer requests for label mappings immediately, without waiting for a label mapping from the next hop. In independent downstream unsolicited mode, an LSR might advertise a label mapping for an Forwarding Equivalence Class (FEC) to its neighbors whenever it is prepared to label-switch that FEC. In independent mode, an upstream label can be advertised before a downstream label is received.

In ordered control mode, an LSR may initiate the transmission of label mapping only for an FEC for which it has a label mapping for the FEC next hop, or for which the LSR is the egress. For each FEC for which the LSR is not the egress and no mapping exists, the LSR must wait until a label from a downstream LSR is received. An LSR may be an egress for some FECs and a non-egress for others. Changes in control mode only affect labels that were sent or received after the change was made.

Use the `no` parameter to revert to default control mode.

Command Syntax

```
control-mode (ordered|independent)
no control-mode
```

Parameters

`independent`	Sets control mode to independent processing.
`ordered`	Sets control mode to ordered processing.

Command Mode

Router mode

Default

Independent

Example

```
#configure terminal
(config)#router ldp
(config-router)#control-mode ordered
```

debug ldp advertise-labels

Use this command to enable the debugging of LDP advertise-label events.

On using the debug command, the router continues to generate an output until the `no` parameter is used with this command. The debug output and system error messages are written on the virtual terminal. Use the l`og file` or l`og syslog` command in `configure` mode to redirect the debugging output to a file or the syslog.

Use the `no` parameter with this command to disable this function.

Command Syntax

```
debug ldp advertise-labels
no debug ldp advertise-labels
```

Parameters

None

Command Mode

Configure mode, Privileged Exec mode

Example

```
#configure terminal
(config)#log file myfile
(config)#debug ldp advertise-labels
```

debug ldp all

Use this command to enable the debugging of all LDP events.

On using the debug command, the router continues to generate an output until the `no` parameter is used with this command. The debug output and system error messages are written on the virtual terminal. Use the l`og file` or l`og syslog` command in `configure` mode to redirect the debugging output to a file or the syslog.

Use the `no` parameter with this command to disable this function.

Command Syntax

```
debug ldp all
no debug ldp all
no debug all
undebug all
```

Parameters

None

Command Mode

Configure mode, Privileged Exec mode

Example

```
#configure terminal
(config)#log file myfile
(config)#debug ldp all
```

debug ldp cspf

Use this command to enable the debugging of constrained shortest path first (CSPF) events

On using the debug command, the router continues to generate an output until the `no` parameter is used with this command. The debug output and system error messages are written on the virtual terminal. Use the l`og file` or l`og syslog` command in `configure` mode to redirect the debugging output to a file or the syslog.

Use the `no` parameter with this command to disable this function.

Command Syntax

```
debug ldp cspf
```

```
no debug ldp cspf
```

Parameters

None

Command Mode

Configure mode, Privileged Exec mode

Example

```
#configure terminal
(config)#log file myfile
(config)#debug ldp advertise-labels
(config)#debug ldp all
(config)#debug ldp dsm
(config)#debug ldp events
```

debug ldp dsm

Use this command to enable the debugging of LDP DSM events.

On using the debug command, the router continues to generate an output until the `no` parameter is used with this command. The debug output and system error messages are written on the virtual terminal. Use the l`og file` or l`og syslog` command in `configure` mode to redirect the debugging output to a file or the syslog.

Use the `no` parameter with this command to disable this function.

Command Syntax

```
debug ldp dsm
```

```
no debug ldp dsm
```

Parameters

None

Command Mode

Configure mode, Privileged Exec mode

Example

```
#configure terminal
(config)#log file myfile
(config)#debug ldp dsm
```

debug ldp events

Use this command to enable the debugging of all LDP events.

On using the debug command, the router continues to generate an output until the `no` parameter is used with this command. The debug output and system error messages are written on the virtual terminal. Use the l`og file` or l`og syslog` command in `configure` mode to redirect the debugging output to a file or the syslog.

Use the `no` parameter with this command to disable this function.

Command Syntax

```
debug ldp events
```

```
no debug ldp events
```

Parameters

None

Command Mode

Configure mode, Privileged Exec mode

Example

```
#configure terminal
(config)#log file myfile
(config)#debug ldp advertise-labels
(config)#debug ldp all
(config)#debug ldp dsm
(config)#debug ldp events
```

debug ldp fsm

Use this command to enable the debugging of LDP FSM events.

On using the debug command, the router continues to generate an output until the `no` parameter is used with this command. The debug output and system error messages are written on the virtual terminal. Use the l`og file` or l`og syslog` command in `configure` mode to redirect the debugging output to a file or the syslog.

Use the `no` parameter with this command to disable this function.

Command Syntax

```
debug ldp fsm
no debug ldp fsm
```

Parameters

None

Command Mode

Configure mode, Privileged Exec mode

Example

```
#configure terminal
(config)#log file myfile
(config)#debug ldp fsm
```

debug ldp graceful-restart

Use this command to enable the debugging of LDP graceful-restart events.

On using the debug command, the router continues to generate an output until the `no` parameter is used with this command. The debug output and system error messages are written on the virtual terminal. Use the l`og file` or l`og syslog` command in `configure` mode to redirect the debugging output to a file or the syslog.

Use the `no` parameter with this command to disable this function.

Command Syntax

```
debug ldp graceful-restart
no debug ldp graceful-restart
```

Parameters

None

Command Mode

Configure mode, Privileged Exec mode

Example

```
#configure terminal
(config)#log file myfile
(config)#debug ldp graceful-restart
```

debug ldp hexdump

Use this command to enable the debugging of LDP hexdump events.

On using the debug command, the router continues to generate an output until the `no` parameter is used with this command. The debug output and system error messages are written on the virtual terminal. Use the l`og file` or l`og syslog` command in `configure` mode to redirect the debugging output to a file or the syslog.

Use the `no` parameter with this command to disable this function.

Command Syntax

```
debug ldp hexdump
```

```
no debug ldp hexdump
```

Parameters

None

Command Mode

Configure mode, Privileged Exec mode

Example

```
#configure terminal
(config)#log file myfile
(config)#debug ldp hexdump
```

debug ldp nsm

Use this command to enable the debugging of LDP NSM events.

On using the debug command, the router continues to generate an output until the `no` parameter is used with this command. The debug output and system error messages are written on the virtual terminal. Use the l`og file` or l`og syslog` command in `configure` mode to redirect the debugging output to a file or the syslog.

Use the `no` parameter with this command to disable this function.

Command Syntax

```
debug ldp nsm
```

```
no debug ldp nsm
```

Parameters

None

Command Mode

Configure mode, Privileged Exec mode

Example

```
#configure terminal
(config)#log file myfile
(config)#debug ldp nsm
```

debug ldp packet

Use this command to enable the debugging of LDP packet events.

On using the debug command, the router continues to generate an output until the `no` parameter is used with this command. The debug output and system error messages are written on the virtual terminal. Use the l`og file` or l`og syslog` command in `configure` mode to redirect the debugging output to a file or the syslog.

Use the `no` parameter with this command to disable this function.

Command Syntax

```
debug ldp packet
debug ldp packet (notification|hello|initialization|keepalive|address|label)
no debug ldp packet
no debug ldp packet (notification|hello|initialization|keepalive|address|label)
```

Parameters

`notification`	Debug LDP notification packets.
`hello`	Debug LDP hello packets.
`initialization`	Debug LDP initialization packets.
`keepalive`	Debug LDP keepalive packets.
`address`	Debug LDP address (withdraw) packets.
`label`	Debug LDP address label packets.

Command Mode

Configure mode, Privileged Exec mode

Example

```
#configure terminal
(config)#log file myfile
(config)#debug ldp packet hello
```

debug ldp qos

Use this command to enable the debugging of LDP QoS (quality of service) events.

On using the debug command, the router continues to generate an output until the `no` parameter is used with this command. The debug output and system error messages are written on the virtual terminal. Use the l`og file` or l`og syslog` command in `configure` mode to redirect the debugging output to a file or the syslog.

Use the `no` parameter with this command to disable this function.

Command Syntax

```
debug ldp qos
no debug ldp qos
```

Parameters

None

Command Mode

Configure mode, Privileged Exec mode

Example

```
#configure terminal
(config)#log file myfile
(config)#debug ldp qos
```

debug ldp tsm

Use this command to enable the debugging of LDP TSM events.

On using the debug command, the router continues to generate an output until the `no` parameter is used with this command. The debug output and system error messages are written on the virtual terminal. Use the l`og file` or l`og syslog` command in `configure` mode to redirect the debugging output to a file or the syslog.

Use the `no` parameter with this command to disable this function.

Command Syntax

```
debug ldp tsm
```

```
no debug ldp tsm
```

Parameters

None

Command Mode

Configure mode, Privileged Exec mode

Example

```
#configure terminal
(config)#log file myfile
(config)#debug ldp tsm
```

debug ldp usm

Use this command to enable the debugging of LDP USM events.

On using the debug command, the router continues to generate an output until the `no` parameter is used with this command. The debug output and system error messages are written on the virtual terminal. Use the l`og file` or l`og syslog` command in `configure` mode to redirect the debugging output to a file or the syslog.

Use the `no` parameter with this command to disable this function.

Command Syntax

```
debug ldp usm
```

```
no debug ldp usm
```

Parameters

None

Command Mode

Configure mode, Privileged Exec mode

Example

```
#configure terminal
(config)#log file myfile
(config)#debug ldp usm
```

debug ldp vc usm

Use this command to enable the debugging of LDP VC events.

On using the debug command, the router continues to generate an output until the `no` parameter is used with this command. The debug output and system error messages are written on the virtual terminal. Use the l`og file` or l`og syslog` command in `configure` mode to redirect the debugging output to a file or the syslog.

Use the `no` parameter with this command to disable this function.

Command Syntax

```
debug ldp vc dsm
debug ldp vc usm
no debug ldp vc dsm
no debug ldp vc usm
```

Parameters

`dsm`	Debug LDP downstream SM.
`usm`	Debug LDP upstream SM.

Command Mode

Configure mode, Privileged Exec mode

Example

```
#configure terminal
(config)#log file myfile
(config)#debug ldp vc dsm
(config)#debug ldp vc usm
```

disable-ldp

Use this command to disable LDP IPv4 or LDP IPv6 on a specified interface.

This command disables the transmission of Hello packets through the current interface, and clears all created sessions and adjacencies for this interface. Use `disable-ldp` alone to disable only LDP IPv4 on the interface.

Command Syntax

```
disable-ldp (ipv4|)
disable-ldp (ipv4|ipv6|)
```

Parameters

`ipv4`	Disables IPv4 on the interface.
`ipv6`	Disables IPv6 on the interface.

Command Mode

Interface mode

Examples

The following example disables LDP IPv4 on interface eth0.

```
#configure terminal
(config)#interface eth0
(config-if)#disable-ldp
```

The following example disables LDP IPv4 on interface eth0.

```
#configure terminal
(config)#interface eth0
(config-if)#disable-ldp ipv4
```

The following example disables LDP IPv6 on interface eth0.

```
#configure terminal
(config)#interface eth0
(config-if)#disable-ldp ipv6
```

enable-ldp

Use this command to enable LDP IPv4 or LDP IPv6, or LDP IPv4 and IPv6, on a specified interface. This command enables the transmission of Hello packets through the current interface, so that LDP adjacencies and LDP sessions can be created. Use the both parameter to enable both LDP IPv4 and LDP IPv6 on the interface. Both adjacencies come up, and a session will be formed with either one of the address families.

Note: The corresponding interface in the NSM must be enabled for label-switching using the `label-switching` command in the NSM for the interface. See the *Network Services Module Command Reference* for details about the `label-switching` command.

Command Syntax

```
enable-ldp ipv4 (igp-sync|no-igp-sync|)
enable-ldp (ipv6|both) (igp-sync|no-igp-sync|)
```

Parameters

`igp-sync`	Enable LDP-IGP synchronization.
`no-igp-sync`	Disable LDP-IGP synchronization.
`both`	Enable both IPv4 and IPv6 on the interface.
`ipv4`	Enable IPv4 on the interface.
`ipv6`	Enable IPv6 on the interface.

Command Mode

Interface mode

Examples

The following example enables LDP IPv4 on interface eth0.

```
#configure terminal
(config)#interface eth0
(config-if)#enable-ldp ipv4
```

The following example enables LDP IPv6 on interface eth0.

```
#configure terminal
(config)#interface eth0
(config-if)#enable-ldp ipv6
```

The following example enables LDP IPv4 and LDP IPv6 on interface eth0.

```
#configure terminal
(config)#interface eth0
(config-if)#enable-ldp both
```

explicit-null

Use this command to configure the router to send explicit-null labels for directly connected FECs instead of implicit-null labels. Implicit-nulls are the default labels.

This command controls the label value advertised on the egress router of an LSP. By default, implicit null label (label 3) is advertised for directly connected FECs. LDP advertises an Implicit Null label that causes the previous hop router to perform penultimate hop popping. Use the `explicit null` command to avoid the penultimate router from penultimate hop popping, and to force it to replace the incoming label with the explicit null label.

Note: Do not use this command if the LDP is concurrently used for MPLS/BGP VPNs.

Use the `no` parameter to stop sending explicit-null labels for directly connected FECs and resume sending implicit-null labels for them.

Command Syntax

```
explicit-null
no explicit-null
```

Parameters

None

Default

Sends implicit-null labels.

Command Mode

Router mode

Examples

```
#configure terminal
(config)#router ldp
(config-router)#explicit-null
```

global-merge-capability

Use this command to override the default merge capability setting of all the interfaces for the current LSR.

The merge capability aggregates multiple incoming flows with the same destination address into a single outgoing flow. This reduces the label-space shortage by sharing labels for different flows with the same destination, or the same FEC (Forwarding Equivalence Class).

Use the `no` parameter to revert to the default merge capability settings of all the interfaces for this LSR.

Command Syntax

```
global-merge-capability (merge-capable|non-merge-capable)
no global-merge-capability
```

Parameters

`merge-capable` Maps all incoming labels that are destined for the same FEC to the same outgoing label (this is the Ethernet default.)

`non-merge-capable`

Maps all incoming labels, regardless of destination FEC to unique outgoing labels (this is the non-Ethernet default.)

Default

Global merge capability.

Command Mode

Router mode

Examples

```
#configure terminal
(config)#router ldp
(config-router)#global-merge-capability merge-capable
```

graceful-restart

Use this command with the `enable` option to enable Graceful Restart capability on a router. This is a global command. LDP decides whether or not to encode FT Session TLV in its initialization message for each session depending on this capability, but the restart capability of each session also depends on support for graceful restart at the peer router.

Use the `disable` option to disable Graceful Restart on a router. Graceful Restart is disabled by default

Command Syntax

```
graceful-restart (enable|disable)
graceful-restart (enable helper-mode)
```

Parameters

`enable`	Enable graceful restart capability on a router.
`disable`	Disable graceful restart capability on a router.
`enable`	Enable helper-mode capability.
`helper-mode`	Helper-mode capability.

Default

Disabled

Command Mode

Router mode

Example

This example shows how to enable graceful restart capability on a router:

```
#conf terminal
(config)#router ldp
(config-router)#graceful-restart enable
```

graceful-restart timers max-recovery

Use this command to set the maximum recovery time.

If the LSR determines that the neighbor was able to preserve its MPLS forwarding state, the LSR should keep the stale label-FEC (Forwarding Equivalence Class) bindings for as long as the lesser of: the recovery time advertised by the neighbor and a local maximum recovery time. This command sets the maximum recovery time.

Use the `no` parameter with this command to set the maximum recovery time to the default value.

Command Syntax

```
graceful-restart timers max-recovery <15-600>
no graceful-restart timers max-recovery
```

Parameters

`<15-600>`	Specify the maximum recovery value in seconds.

Default

Default is 120 seconds.

Command Mode

Router mode

Examples

```
#configure terminal
(config)#router ldp
(config-router)#graceful-restart timers max-recovery 200

(config-router)#no graceful-restart timers max-recovery
```

graceful-restart timers neighbor-liveness

Use this command to set the Neighbor-Liveness timer.

The amount of time the LSR keeps its stale label-FEC (Forwarding Equivalence Class) bindings is set to the lesser of the Fault Tolerant (FT) Reconnect timeout and Neighbor-Liveness timer. This command sets the Neighbor-Liveness timer.

Use the `no` parameter with this command to set the Neighbor-Liveness timer to the default value.

Command Syntax

```
graceful-restart timers neighbor-liveness <5-300>
no graceful-restart timers neighbor-liveness
```

Parameters

`<5-300>`	Specify the Neighbor-Liveness value in seconds.

Default

Default is 120 seconds.

Command Mode

Router mode

Examples

```
#configure terminal
(config)#router ldp
(config-router)#graceful-restart timers neighbor-liveness 100

(config-router)#no graceful-restart timers neighbor-liveness
```

hello-interval

Use this command to set the interval after which `hello` packets are sent out.

LDP defines a mechanism for discovering adjacent Label Switching Routers (LSRs) that participate in label switching (adjacencies). Hello messages are sent to the All Routers Multicast Group (224.0.0.2). Whenever a new router comes up, it sends out a hello packet to a specified, multicast address announcing itself to the network. Every router directly connected to the network receives the packet. Receipt of a hello packet from another LSR creates a `hello adjacency` with that LSR. Use this command to specify the interval after which the hello packets will be sent.

Used as a global command, the hello-interval value may be overridden by the hello-interval set on the interface (see ldp hello-interval on page 57). For optimum performance, set this value to no more than one-third the value of the hold-time specified.

Use the `no` parameter to revert to default hello interval.

Command Syntax

```
hello-interval <1-21845>
no hello-interval
```

Parameters

`<1-21845>`	Specify the interval in seconds. The default is 5 seconds.

Command Mode

Router mode

Examples

This example shows how to set the hello-interval value for all interfaces of an LSR.

```
#configure terminal
(config)#router ldp
(config-router)#hello-interval 35

(config-router)#no hello-interval
```

hold-time

Use this command to set the global value for the hold-time after which the LSR rejects adjacencies.

An LSR maintains a record of `hellos` received from peers. `Hold-time` specifies the time an LSR maintains its record of hellos from a peer on not receiving another hello from that peer. A pair of LSRs negotiates the hold-time they use for hellos from each other. Each proposes a hold time value, and the LSR uses the lower of the two hold-time values. The hold-time value set on the interface overrides the hold-time value set by this command (see ldp hold-time). For optimum performance, set this value to no less than three times the value of the hello-interval specified.

Use the `no` parameter to revert to the default hold time.

Command Syntax

```
hold-time <3-65535>
no hold-time
```

Parameters

`<3-65535>`	Specify the hold-time value in seconds.

Default

Default is 15 seconds

Command Mode

Router mode

Example

This example shows how to set the hold-time value for all interfaces of an LSR.

```
#configure terminal
(config)#router ldp
(config-router)#hold-time 635

(config-router)#no hold-time
```

import-bgp-routes

Use this command to import BGP routes into LDP. BGP routes are not imported into LDP by default.

Use the `no` parameter to flush out all BGP routes currently being used by LDP, and to reject any further BGP specific routing updates from ZebOS-XP.

Command Syntax

```
import-bgp-routes
no import-bgp-routes
```

Parameters

None

Command Mode

Router mode

Example

```
#configure terminal
(config)#router ldp
(config-router)#import-bgp-routes
```

inter-area-lsp

Use this command to enable creation of inter-area LSPs.

Use the `no` form of the command to disable this configuration.

Command Syntax

```
inter-area-lsp (config-only|)
no inter-area-lsp
```

Parameter

`config-only`	Optional. When this option is used, existing LDP sessions are not torn down.

Command Mode

Router mode

Example

```
#configure terminal
(config)#router ldp
(config-router)#inter-area-lsp
```

keepalive-interval

Use this command to set the global value for the interval after which keep-alive packets are sent out.

Each LSR must send keep-alive messages at regular intervals to its LDP peers to keep the sessions active. The keep-alive interval determines the time interval between successive keep-alive messages. Use this command to set this interval. This value is overridden by the keep-alive interval set on the interface. For optimum performance, set this value to no more than one-third the value of the specified keep-alive time-out value.

Use the `no` parameter to revert to default keep-alive interval.

Command Syntax

```
keepalive-interval <10-21845>
no keepalive-interval
```

Parameters

`<10-21845>`	Specify the value of interval in seconds.

Default

Default is 10 seconds.

Command Mode

Router mode

Example

This example shows how to set the keep-alive timer for all interfaces of an LSR.

```
#configure terminal
(config)#router ldp
(config-router)#keepalive-interval 635

(config-router)#no keepalive-interval
```

keepalive-timeout

Use this command to set the global value for the time-out after which sessions are rejected.

Use this command to set the time period for which an LSR must wait for successive keep-alive messages from LDP peers. The keep-alive time-out value is overridden by the keep-alive time-out set on the interface (see ldp keepalive-timeout). For optimum performance, set this value to no less than three times the value of the specified keep-alive interval value.

Use the `no` parameter to revert to default keep-alive time-out.

Command Syntax

```
keepalive-timeout <30-65535>
no keepalive-timeout
```

Parameters

`<30-65535>`	Specify the time-out value in seconds.

Default

Default is 30 seconds.

Command Mode

Router mode

Example

This example shows how to set the keep-alive time-out value for all interfaces of an LSR.

```
#configure terminal
(config)#router ldp
(config-router)#keepalive-timeout 635

(config-router)#no keepalive-timeout
```

label-retention-mode

Use this command to set the retention mode to be used for all labels exchanged.

When an LSR receives a label binding for a particular FEC (Forwarding Equivalence Class) from another LSR that is not its next hop for that FEC, it might keep track of such bindings or discard them. Use the `liberal` parameter to retain all labels binding to FEC received from label distribution peers, even if the LSR is not the current next-hop. Use the `conservative` parameter to maintain only the label bindings for valid next-hops in a LSP. Liberal label retention mode allows for quicker adaptation to routing changes, whereas conservative label retention mode requires an LSR to maintain fewer labels.

Note: The retention mode value set on the interface (see ldp label-retention-mode on page 61) overrides the value set by this command.

Note: Any changes made to the retention mode for an interface (after a session is already operational) will only apply to labels received after the mode has been changed. All previously received labels will remain as they were.

Use the `no` parameter to revert to default retention mode.

Command Syntax

```
label-retention-mode (conservative|liberal)
no label-retention-mode (conservative|liberal)
```

Parameters

`conservative`	Specify to delete all unused labels and FECs.
`liberal`	Specify to retain all labels, regardless of use.

Command Mode

Router mode

Default

Liberal

Example

This example shows how to set the retention mode for all interfaces of an LSR.

```
#configure terminal
(config)#router ldp
(config-router)#label-retention-mode liberal
```

ldp advertisement-mode

Use this command to set the label advertisement mode for an interface for the current LSR to either downstream-on-demand (label is sent only when requested) or downstream-unsolicited (label is sent unrequested). Specifying downstream-on-demand and downstream-unsolicited mode affects which LSR initiates mapping requests and mapping advertisements.

This is an interface-specific command; it overrides the advertisement mode set for an LSR using the advertisement-mode command (see advertisement-mode on page 22). Use this command after the advertisement-mode command sets all the interface advertisement modes. In addition, users should use this command before starting the interface, since all affected sessions will be closed and restarted.

Use the `no` parameter to revert to the advertisement mode value set for the main LDP process.

Command Syntax

```
ldp advertisement-mode (downstream-on-demand|downstream-unsolicited)
no ldp advertisement-mode (downstream-on-demand|downstream-unsolicited)
```

Parameters

`downstream-on-demand`

Indicates that the sent label was requested. When a user uses this parameter, a router distributes a label to a peer only if there is a pending label request from a peer. The reaction of the downstream router to this request depends on the label advertising mode supported on the next hop. The downstream-on-demand mode is typically used with the conservative label retention mode.

`downstream-unsolicited`

Indicates that the label was sent unrequested. This parameter distributes labels to peers without waiting for a label request. This mode is typically used with the liberal label retention mode.

Command Mode

Router mode

Example

```
#configure terminal
(config)#interface eth0
(config-if)#ldp advertisement-mode downstream-on-demand
```

ldp hello-interval

Use this command to set the interval for sending multicast Hello packets via an interface.

LDP defines a mechanism for discovering adjacent Label Switching Routers (LSR) that participate in label switching (adjacencies). Whenever a new router comes up, it sends out a hello packet to a specified, multicast address announcing itself to the network. Every router directly connected to the network receives the packet. Receipt of a hello packet from another LSR creates a hello adjacency with that LSR. Use this command to specify the interval after which the hello packets will be sent.

For optimum performance, set the hello-interval value to no more than one-third the hold-time value.

Note: This command is an interface-specific command and overrides the value set for an LSR using the global hello-interval command.

Use the `no` parameter with this command to revert to the hello-interval value set for the main LDP process.

Command Syntax

```
ldp hello-interval <1-21845>
no ldp hello-interval
```

Parameters

`<1-21845>`	Specify the interval in seconds.

Command Mode

Interface mode

Examples

This example shows how to set the hello-interval for a specific interface.

```
#configure terminal
(config)#interface eth0
(config-if)#ldp hello-interval 635

(config-if)#no ldp hello-interval
```

ldp hold-time

Use this command to set the hold-time value after which the LSR rejects adjacencies.

The hold-time timer is reset every time a hello packet is received from the peer in question. For optimum performance, set this value to no less than three times the hello-interval value.

Note: This command is an interface-specific command, and overrides the value set for an LSR using the global hold-time command.

Use the `no` parameter to revert to the hold-time value set for the main LDP process.

Command Syntax

```
ldp hold-time <3-65535>
no ldp hold-time
```

Parameters

`<3-65535>`	Specify the hold-time value in seconds.

Command Mode

Interface mode

Example

This example shows how to set the hold-time for a specific interface:

```
#configure terminal
(config)#interface eth0
(config-if)#ldp hold-time 635

(config-if)#no ldp hold-time
```

ldp keepalive-interval

Use this command to set the interval for sending keep-alive messages to the peer in order to maintain a session.

Each LSR must send keep-alive messages at regular intervals to its LDP peers to keep the sessions active. The keep-alive interval determines the time-interval between successive keep-alive messages. This command sets this interval.

Note: This command is an interface-specific command, and overrides the value set for an LSR using the global `keepalive-interval` command.

Use the `no` parameter to revert to the keep-alive interval set for the main LDP process.

Command Syntax

```
ldp keepalive-interval <10-21845>
no ldp keepalive-interval
```

Parameters

`<10-21845>`	Specify the interval in seconds.

Command Mode

Interface mode

Examples

This example shows how to set the hello-interval for a specific interface:

```
#configure terminal
(config)#interface eth0
(config-if)#ldp keepalive-interval 635

(config-if)#no ldp keepalive-interval
```

ldp keepalive-timeout

Use this command to set the keep-alive time-out value for rejecting a session with a peer.

Use this command to set the time period for which an LSR must wait for successive keep-alive messages from LDP peers. The keep-alive timer is reset every time a keep-alive packet is received from the peer in question. For optimum performance, set this value to no more than three times the keep-alive interval value.

Note: This command is an interface-specific command and overrides the value set for an LSR using the global `keepalive-timeout` command.

Use the `no` parameter to revert to the keep-alive time-out set for the main LDP process.

Command Syntax

```
ldp keepalive-timeout <30-65535>
no ldp keepalive-timeout
```

Parameters

`<30-65535>`	Specify the value in seconds.

Command Mode

Interface mode

Example

This example shows how to set the keep-alive time-out timer for a specific interface:

```
#configure terminal
(config)#interface eth0
(config-if)#ldp keepalive-timeout 635

(config-if)#no ldp keepalive-timeout
```

ldp label-retention-mode

Use this command to set the retention mode to be used for all labels exchanged via the given interface.

When an LSR receives a label binding for a particular FEC (Forwarding Equivalence Class) from another LSR that is not its next hop for that FEC, it might keep track of such bindings or discard them. Use the `liberal` parameter to retain all labels binding to FEC received from label distribution peers, even if the LSR is not the current next-hop. Use the `conservative` parameter to maintain only the label bindings for valid next-hops in a LSP. Liberal label retention mode allows for quicker adaptation to routing changes, whereas conservative label retention mode requires an LSR to maintain fewer labels.

Note: The retention mode value set on the interface (see label-retention-mode on page 55) overrides the value set by this command. This command is an interface-specific command, and overrides the setting for an LSR using the global `label-retention-mode` command.

Use the `no` parameter to revert to the retention mode set for the main LDP process.

Command Syntax

```
ldp label-retention-mode (conservative|liberal)
no ldp label-retention-mode (conservative|liberal)
```

Parameters

`conservative`	Specify to delete all unused labels and FECs.
`liberal`	Specify to retain all labels, regardless of use.

Command Mode

Interface mode

Example

This example shows how to set the label retention mode for a specific interface:

```
#configure terminal
(config)#interface eth0
(config-if)#ldp label-retention-mode liberal
```

ldp multicast-hellos

Use this command to enable multicast hello exchange on a specified interface.

Use the `no` parameter to disable multicast hello exchange. R

Command Syntax

```
ldp multicast-hellos
no ldp multicast-hellos
```

Parameters

None

Default

Enabled

Command Mode

Interface mode

Example

```
#configure terminal
(config)#interface eth0
(config-if)#ldp multicast-hellos
```

ldp-optimization

This command helps optimize the resetting of an LDP session by enabling the following two scalability features for LDP:

- Resets the session keepalive timer on receipt of a hello message
- Resets the hold timer on receipt of any LDP control message

Use the `no` parameter to disable the two previously listed scalability features.

Command Syntax

```
ldp-optimization
no ldp-optimization
```

Parameters

None

Default

Disabled

Command Mode

Interface mode

Example

```
#configure terminal
(config)#interface eth0
(config-if)#ldp-optimization
```

loop-detection

Use this command to enable loop detection on the current LSR. This command detects looping LSPs, and prevent Label Request messages from looping because of non-merge capable LSRs. This loop detection mechanism is useful for networks of non time-to-live (non TTL) decrementing devices that can not allocate resources among traffic flows.

There are two methods supported for the loop detection mechanism: A Hop Count detection system, that is always enabled; and the Path Vector detection system, that can be toggled:

- Hop Count - During the setup of an LSP, the LSP passes a hop count with the LSP setup messages. This hop count is incremented by each node router participating in LSP establishment. If the hop count exceeds the maximum configured value, the LSP setup process is stopped, and a notification message is passed back to the message originator.
- Path Vector - A path vector contains a list of LSR identifiers. This is passed as a part of LSP setup messages. Each LSR participating in the LSP establishment adds its own LSR identifier to the path vector. If an LSR finds its own identifier in the path vector, it drops the message, and sends a message back to the originator.

The use of these messages ensures that a loop is detected while establishing a label switched path and before any data is passed over that LSP.

Use the `no` parameter to disable loop detection.

Command Syntax

```
loop-detection
no loop-detection
```

Parameters

None

Command Mode

Router mode

Example

```
#configure terminal
(config)#router ldp
(config-router)#loop-detection
```

loop-detection-hop-count

Use this command to set the loop detection hop count, which determines the maximum hop-count value.

This command sets the maximum hop count value, which specifies the permitted maximum permitted hop-count. An LSR that detects a maximum hop count behaves as if the containing message has traversed a loop. The use of this command ensures that a loop is detected while establishing a label switched path before any data is passed via LSP.

Use the `no` parameter to revert to the default loop detection count

Command Syntax

```
loop-detection-hop-count <1-255>
no loop-detection-hop-count
```

Parameters

`<1-255>`	Indicates the loop detection hop count.

Command Mode

Router mode

Examples

```
#configure terminal
(config)#router ldp
(config-router)#loop-detection-hop-count 128

(config-router)#no loop-detection-hop-count
```

loop-detection-path-vec-count

Use this command to set the loop detection vec (vector) count, which determines the maximum supported path vectors.

This command sets the maximum supported path vectors for loop detection, which specifies the permitted path vector length. An LSR that detects a path vector has reached the maximum length behaves as if the containing message has traversed a loop. This command ensures that a loop is detected while establishing a label switched path before any data is passed over that LSP.

Use the `no` parameter to revert to the default loop detection count

Command Syntax

```
loop-detection-path-vec-count <1-255>
no loop-detection-path-vec-count
```

Parameters

`<1-255>`	Indicates the loop detection hop count.

Command Mode

Router mode

Example

```
#configure terminal
(config)#router ldp
(config-router)#loop-detection-path-vec-count 123

(config-router)#no loop-detection-path-vec-count
```

mpls ldp-igp sync-delay

Use this command to configure a synchronization delay, that is, a delay for notifications of LDP convergence to the IGP protocol used, which can be either IS-IS or OSPF.

Use the `no` parameter with this command to remove the sync-delay configuration.

Command Syntax

```
mpls ldp-igp sync-delay <5-60>
no mpls ldp-igp sync-delay
```

Parameters

`<50-60>`	Time delay for notification of LDP convergence to IGP, in seconds

Command Mode

Interface mode

Examples

```
#configure terminal
(config-if)# interface eth0
(config-if)# mpls ldp-igp sync-delay 5

(config-if)# no mpls ldp-igp sync-delay
```

multicast-hellos

Use this command to enable multicast hello exchange on all interfaces enabled for LDP. This is used for auto-discovery of LDP peers on directly connected networks. This option is enabled by default.

Use the `no` parameter with this command to disable multicast hello exchange.

Command Syntax

```
multicast-hellos
no multicast-hellos
```

Parameters

None

Default

Enabled

Command Mode

Router mode

Example

```
#configure terminal
(config)#router ldp
(config-router)#multicast-hellos
```

neighbor

Use this command to configure neighbors of LDP.

Use the `no` parameter with this command to unconfigure the LDP neighbor

Command Syntax

```
neighbor (A.B.C.D | WORD | X:X::X:X) auth md5 password <0-7> WORD
no multicast-hellos
```

Parameters

`A.B.C.D`	Neighbor address
`WORD`	Neighbor tag
`X:X::X:X`	Neighbor IPv6 address
`<0-7>`	Password Type
`WORD`	Password

Command Mode

Router mode

Example

```
#configure terminal
(config)#router ldp
(config-router)#neighbor 1.1.1.1 auth md5 password 0 ipi

(config-router)#neighbor 1.1.1.1 auth md5 password 0 ipi
```

propagate-release

Use this command to propagate the release of labels to downstream routers.

Use the `no` parameter to prevent the propagate-release of labels.

Command Syntax

```
propagate-release
no propagate-release
```

Parameters

None

Command Mode

Router mode

Example

```
#configure terminal
(config)#router ldp
(config-router)#propagate-release
```

pw-status-tlv

Use this command to enable the use of the PW Status TLV to signal the pseudowire status.

Use the `no` option with this command to disable the use of the PW Status TLV to signal the pseudowire status.

Command Syntax

```
pw-status-tlv
no pw-status-tlv
```

Parameters

None

Default

Disabled

Command Mode

Router mode

Example

```
#configure terminal
(config)#router ldp
(config-router)#pw-status-tlv
```

request-retry

Use this command to enable the retry of requests once a request for a label has been rejected for a valid reason. This command enables the LSR to send a maximum of five label requests if a label request is rejected by an LDP peer.

Use the `no` parameter to disable the retry of requests.

Command Syntax

```
request-retry
no request-retry
```

Parameters

None

Default

Disabled

Command Mode

Router mode

Examples

```
#configure terminal
(config)#router ldp
(config-router)#request-retry
```

request-retry-timeout

Use this command to set the interval between retries. Before this time is over, a request is re-sent to a peer. This command changes the interval between request messages that are resent to a peer to account for routing changes.

Use the `no` parameter to revert to the default request-retry time-out set.

Command Syntax

```
request-retry-timeout <1-65535>
no request-retry-timeout
```

Parameter

`<1-65535>`	Specify the interval between retries in seconds.

Default

Default timeout is 5 seconds.

Command Mode

Router mode

Example

```
#configure terminal
(config)#router ldp
(config-router)#request-retry-timeout 512

(config-router)#no request-retry-timeout
```

restart ldp graceful

Use this command to force an LDP restart as a graceful restart.

This command initiates the graceful restart mechanism when the LDP process terminates. The same effect can be realized by explicitly killing the LDP process or by issuing a “no router ldp” command. For the restart to be deemed graceful, the LDP process must be restarted within the reconnect time-interval.

Command Syntax

```
restart ldp graceful
```

Parameters

None

Command Mode

Privileged Exec mode

Example

```
#restart ldp graceful
```

router ldp

This command is used to enter the LDP specific command-line mode in which global attributes for the LDP process can be set. Without this command, the LSR does not perform any LDP operations, such as sending `hello` packets.

Use the `no` parameter with this command to disable this configuration.

Command Syntax

```
router ldp
no router ldp
```

Parameters

None

Command Mode

Configure mode

Example

The following example shows the change in the prompt after using this `router ldp` command to enter router mode.

```
#configure router
(config)#router ldp
(config-router)#
```

router-id

Use this command to set the router-id to the supplied IP address; the router uses this address to generate the LDP-ID.

ZebOS-XP has three methods to choose the router-id of LDP. The first priority router-id is the configured router-id in router mode (local configured router-id). The second priority router-id is the configured router-id in configure mode (global configured router-id). The lowest priority router-id is chosen by NSM among interfaces (global computed router-id).

Use the `no` parameter with this command to revert to using the first IP address configured on the box as the router-id for LDP-ID generation purposes.

Command Syntax

```
router-id A.B.C.D
no router-id A.B.C.D
no router-id
```

Parameter

`A.B.C.D`	Indicates the LDP router ID value.

Command Mode

Configure mode

Example

```
#configure router
(config)#router ldp
(config-router)#router-id 123.123.123.8
```

snmp restart ldp

Use this command to restart SNMP in Label Distribution Protocol (LDP)

Command Syntax

```
snmp restart ldp
```

Parameters

None

Command Mode

Configure mode

Examples

```
#snmp restart ldp
```

targeted-peer ipv4

Use this command to enter a targeted IPv4 LDP peer mode.

A targeted session is an LDP session between non-directly connected LSRs. Set this command to send a targeted hello messages to specific IP addresses. This command is specific to a targeted IPv4 LDP peer.

Command Syntax

```
targeted-peer ipv4 A.B.C.D
no targeted-peer ipv4 A.B.C.D
```

Parameter

A.B.C.D	Specify the IPv4 address of the targeted peer.

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#router ldp
(config-router)#targeted-peer ipv4 10.10.10.10
(config-router-targeted-peer)#
```

targeted-peer ipv6

Use this command to specify a targeted IPv6 LDP peer.

A targeted session is an LDP session between non-directly connected LSRs. Set this command to send a targeted hello messages to specific IP addresses. This command is specific to a targeted IPv6 LDP peer.

Command Syntax

```
targeted-peer ipv6 X:X::X:X
no targeted-peer ipv6 X:X::X:X
```

Parameter

`X:X::X:X`	Specify the IPv6 address of the targeted peer.

Command Mode

Router mode

Example

```
#configure terminal
(config)#router ldp
(config-router)#targeted-peer ipv6 3ffe::7
```

targeted-peer-hello-interval

Use this command to set the interval for sending unicast `hello` packets to targeted peers.

Use the `no` parameter with this command to revert to the default targeted-peer hello-interval value.

Command Syntax

```
targeted-peer-hello-interval <1-21845>
no targeted-peer-hello-interval
```

Parameter

`<1-21845>`	Specify the interval in seconds.

Default

Default is 15 seconds.

Command Mode

Router mode

Example

```
#configure terminal
(config)#router ldp
(config-router)#targeted-peer-hello-interval 1
```

targeted-peer-hold-time

Use this command to set the time-out value that is the time that the router waits before rejecting an adjacency with targeted peers.

Use the `no` parameter to revert to the default targeted-peer hold-time value.

Command Syntax

```
targeted-peer-hold-time <3-65535>
no targeted-peer-hold-time
```

Parameter

`<3-65535>`	Specify the interval in seconds.

Default

Default is 45 seconds.

Command Mode

Router mode

Example

```
#configure terminal
(config)#router ldp
(config-router)#targeted-peer-hold-time 555

(config-router)#no targeted-peer-hold-time
```

transport-address ipv4

Use this command to configure the IPv4 transport address for a label space.

The transport address is the address used for the TCP session over which LDP is running. Use this command to manually configure the transport address. Transport addresses may either be bound to a loopback interface, or to a physical interface that is bound to the label space in question. A transport address can also be manually configured using the CLI with the loopback address as the transport address.

Note: The CLI accepts only the loopback address to be configured as the transport address.

Use the `no` parameter to stop using the transport address as the IPv4 transport address. If the label space is not specified for either form of this command, a label space of zero is assumed.

Command Syntax

```
transport-address ipv4 A.B.C.D
transport-address ipv4 A.B.C.D LABELSPACE
no transport-address ipv4 A.B.C.D
no transport-address ipv4 A.B.C.D LABELSPACE
```

Parameters

`A.B.C.D`	Specify the IPv4 address to be used as the transport address. Only addresses bound to a loopback interface are valid for manual transport address configuration.
`LABELSPACE`	Specify the name of the label space.

Default

Transport addresses are chosen for label spaces. By default, the loopback address is selected as the transport address. If a loopback address is not configured, the label space value is examined. The IP address of the interface is bound to the same label space is chosen as the transport address.

Command Mode

Router mode

Example

```
#configure router
(config)#router ldp
(config-router)#transport-address ipv4 10.10.0.5 myspace
```

transport-address ipv6

Use this command to configure an IPv6 transport address for a label space.

The transport address is the address used for the TCP session over which LDP is running. Use this command to manually configure the transport address. Transport addresses may either be bound to a loopback interface, or to a physical interface that is bound to the label space in question. A transport address can also be manually configured using the CLI with the loopback address as the transport address.

The CLI accepts only the loopback address to be configured as the transport address. Refer to the transport-address ipv4 command for detailed case examples

Use the `no` parameter to stop using the transport address as the IPv6 transport address. If no label space is specified for either form of this command, a label space of zero is assumed.

Command Syntax

```
transport-address ipv6 X:X::X:X
transport-address ipv4 A.B.C.D LABELSPACE
no transport-address ipv6 X:X::X:X
no transport-address ipv6 X:X::X:X LABELSPACE
```

Parameters

`A.B.C.D`	Specify the IPv6 address to be used as the transport address. Only addresses bound to a loopback interface are valid for manual transport address configuration.
`LABELSPACE`	Specify the name of the label space.

Default

Transport addresses are chosen for label spaces. By default, the loopback address is selected as the transport address. If a loopback address is not configured, the label space value is examined. The IP address of the interface is bound to the same label space is chosen as the transport address.

Command Mode

Router mode

Examples

```
#configure router
(config)#router ldp
(config-router)#transport-address ipv6 3ffe::7 0
```

CHAPTER 3 LDP Show Commands

This chapter provides an alphabetized reference for each of the LDP commands. It includes the following commands:

show debugging ldp

Use this command to display the status of the debugging of the LDP system.

Command Syntax

```
show debugging ldp
```

Parameter

None

Command Mode

Privileged Exec mode

Example

The following is a sample output from the `show debugging ldp` command.

```
#show debugging ldp
LDP debugging status:
  LDP event debugging is on
  LDP packet debugging is on
  LDP finite state machine debugging is on
  LDP pdu hexdump debugging is on
  LDP downstream state machine debugging is on
  LDP upstream state machine debugging is on
  LDP trunk state machine debugging is on
  LDP QoS debugging is on
  LDP CSPF debugging is on
  LDP VC USM debugging is on
  LDP VC DSM debugging is on
  LDP NSM debugging is on
  LDP Advertise-labels debugging is on
#
```

show ldp

Use this command to display basic LDP attributes defined for the current LSR.

Command Syntax

```
show ldp
```

Parameter

None

Command Mode

Exec mode and Privileged Exec mode

Examples

The following is a sample output from the `show ldp` command displaying basic LDP attributes.

```
#show ldp
Router ID                : 10.10.0.11
LDP Version              : 1
Global Merge Capability  : N/A
Label Advertisement Mode : Downstream Unsolicited
Label Retention Mode     : Liberal
Label Control Mode       : Independent
Loop Detection           : Off
Loop Detection Count     : 0
Request Retry            : Off
Propagate Release        : Disabled
Hello Interval           : 5
Targeted Hello Interval  : 15
Hold time                : 15
Targeted Hold time       : 45
Keepalive Interval       : 10
Keepalive Timeout        : 30
Request retry Timeout    : 5
Targeted Hello Receipt   : Disabled
Transport Address        : N/A
Transport Interface      : N/A
Import BGP routes        : No
#
```

show ldp adjacency

Use this command to display all the adjacencies for the current LSR.

Command Syntax

```
show ldp adjacency
```

Parameter

None

Command Mode

Exec mode and Privileged Exec mode

Example

The following is a sample output from the `show ldp adjacency` command displaying all the adjacencies for this LSR.

```
#show ldp adjacency
IP AddressInterface NameHoldtimeLDP ID
192.168.3.5eth11510.10.0.18:0
192.168.4.5  eth2   15 10.10.0.18:0
```

show ldp advertise-labels

Use this command to display the IP access list of LDP advertise-labels.

Command Syntax

```
show ldp advertise-labels
```

Parameter

None

Command Mode

Exec mode and Privileged Exec mode

Example

The following is a sample output from the `show ldp advertise-labels` command.

```
#show ldp advertise-labels
Advertisement spec:
    Prefix acl = pfx1; Peer acl = pfx1
    Prevent the distribution of any assigned labels
```

show ldp downstream

Use this command to display the status of all downstream sessions and the label information exchanged.

Command Syntax

```
show ldp downstream
```

Parameter

None

Command Mode

Exec mode and Privileged Exec mode

Example

The following is an output from the `show ldp downstream` command showing the status of all downstream sessions.

```
#show ldp downstream
Session peer 1.1.1.1:
  FEC                         Nexthop Addr       State             Label
Req.ID   Attr
  20.0.0.0/24                  connected      Established       impl-null  0
  10.0.2.0/24                  connected      Established       impl-null  0
  1.1.1.1/32                    20.0.0.1      Established       impl-null  0
Session peer 3.3.3.3:
  FEC                         Nexthop Addr       State             Label
Req.ID   Attr
  60.0.0.0/24                  connected      Established          52481  0
  50.0.0.0/24                   30.0.0.2      Established       impl-null  0
  30.0.0.0/24                  connected      Established       impl-null  0
  10.0.2.0/24                  connected      Established       impl-null  0
  5.5.5.5/32                    30.0.0.2      Established          52480  0
  3.3.3.3/32                    30.0.0.2      Established       impl-null  0
Session peer 4.4.4.4:
  FEC                         Nexthop Addr       State             Label
Req.ID   Attr
  50.0.0.0/24                  connected      Established          52483  0
  40.0.0.0/24                  connected      Established       impl-null  0
  10.0.2.0/24                  connected      Established       impl-null  0
  5.5.5.5/32                    40.0.0.2      Established          52480  0
  60.0.0.0/24                   40.0.0.2      Established       impl-null  0
  4.4.4.4/32                    40.0.0.2      Established       impl-null  0
Session peer 1.1.1.1:
  FEC                           State             Label     Req.ID    Attr
  60.0.0.0/24                 Established          52486        0     None
  4.4.4.4/32                  Established          52484        0     None
  50.0.0.0/24                 Established          52483        0     None
  40.0.0.0/24                 Established       impl-null       0     None
  30.0.0.0/24                 Established       impl-null       0     None
  20.0.0.0/24                 Established       impl-null       0     None
  10.0.2.0/24                 Established       impl-null       0     None
  5.5.5.5/32                  Established          52482        0     None
  3.3.3.3/32                  Established          52481        0     None
  2.2.2.2/32                  Established       impl-null       0     None
```

```
Session peer 3.3.3.3:
  FEC                       State              Label     Req.ID    Attr
  60.0.0.0/24               Established         52487        0     None
  4.4.4.4/32                Established         52485        0     None
  1.1.1.1/32                Established         52480        0     None
  40.0.0.0/24               Established      impl-null       0     None
  30.0.0.0/24               Established      impl-null       0     None
  20.0.0.0/24               Established      impl-null       0     None
  10.0.2.0/24               Established      impl-null       0     None
  2.2.2.2/32                Established      impl-null       0     None
Session peer 4.4.4.4:
  FEC                       State              Label     Req.ID    Attr
  50.0.0.0/24               Established         52483        0     None
  40.0.0.0/24               Established      impl-null       0     None
  30.0.0.0/24               Established      impl-null       0     None
  20.0.0.0/24               Established      impl-null       0     None
  10.0.2.0/24               Established      impl-null       0     None
  3.3.3.3/32                Established         52481        0     None
  2.2.2.2/32                Established      impl-null       0     None
  1.1.1.1/32                Established         52480        0     None
```

show ldp fec

Use the following command to display all FECs (Forwarding Equivalence Classes) known to the current LSR.

Command Syntax

```
show ldp fec
show ldp fec cr-lsp detail
show ldp fec (prefix|cr-lsp)
show ldp fec cr-lsp detail (A.B.C.D|self)
show ldp fec cr-lsp detail (A.B.C.D|self) <1-65535>
```

Parameter

`prefix`	Display prefix FEC information.
`cr-lsp`	Constraint-based routing LSP information.
`A.B.C.D`	Ingress router ID.
`self`	Self originated.
`<1-65535>`	LSP ID.

Command Mode

Exec mode and Privileged Exec mode

Example

The following is a sample output from the `show ldp fec` command displaying all the FECs known to this LSR.

```
#show ldp fec
LSR codes    : E/N - LSR is egress/non-egress for this FEC,
               L - LSR received a label for this FEC,
               > - LSR will use this route for the FEC
CodeFEC   SessionOut LabelNexthop Addr
E >10.10.0.0/24        non-existent none     connected
NL 10.10.0.0/24        192.168.3.5impl-nullconnected
E >192.168.3.0/24      non-existent     none     connected
NL 192.168.3.0/24      192.168.3.5impl-nullconnected
E >192.168.4.0/24      non-existent   none     connected
NL 192.168.4.0/24      192.168.3.5  impl-nullconnected
NL 192.168.5.0/24      192.168.3.5  impl-nullinvalid
```

show ldp graceful-restart

Use this command to show all LDP session graceful-restart related values.

Command Syntax

```
show ldp graceful-restart
```

Parameter

None

Command Mode

Exec mode and Privileged Exec mode

Examples

The first displays `My State` of both `eth2` and `eth3` as Operational with no timers running.

```
#show ldp graceful-restart
Peer IP Address    IF Name    Restart    My State     Timer Value
91.91.91.91        eth2       Capable    OPERATIONAL  0(No Timers Running)
93.93.93.93        eth3       Capable    OPERATIONAL  0(No Timers Running)
```

The second example displays `My State` of `eth2` as `Helper Mode` with a `Re-connect Ti`me set:

```
#show ldp graceful-restart
Peer IP Address    IF Name    Restart    My State     Timer Value
91.91.91.91        eth2       Capable    HELPER_MODE  118(Re-connect Time)
93.93.93.93        eth3       Capable    OPERATIONAL  0(No Timers Running)
```

The third example displays `My State` of `eth2` as `Helper Mode` with a `Recovery Tim`e set:

```
#show ldp graceful-restart
Peer IP Address    IF Name    Restart    My State     Timer Value
91.91.91.91        eth2       Capable    HELPER_MODE  117(Recovery Time)
93.93.93.93        eth3       Capable    OPERATIONAL  0(No Timers Running)
```

show ldp inter-area-fecs

Use this command to show all FECs using the LPM-based mapping procedure.

Command Syntax

```
show ldp inter-area-fecs
```

Parameter

None

Command Mode

Exec mode and Privileged Exec mode

Example

The following is an example of the output of this command.

```
#show ldp inter-area-fecs
LSR codes    : E/N - LSR is egress/non-egress for this FEC,
               L - LSR received a label for this FEC,
               > - LSR will use this route for the FEC
Code    FEC                    Session         Out Label       Nexthop Addr
Matching RIB prefix - 1.1.1.0
NL>     1.1.1.1/32             33.33.33.33     52485           11.11.11.1
NL>     1.1.1.2/32             33.33.33.33     52486           11.11.11.1
```

show ldp interface

Use this command to display the list of all interfaces on the current LSR, and to indicate whether a given interface is label-switching or not.

Command Syntax

```
show ldp interface
show ldp interface IFNAME
```

Parameter

`IFNAME`	Displays the name of the interface.

Command Mode

Exec mode and Privileged Exec mode

Examples

The following output displays a list of all interfaces on the LSR.

```
#show ldp interface
Interface    LDP Identifier          Label-switching    Merge Capability
eth0         10.10.0.11:0            Disabled           N/A
lo           10.10.0.11:0            Disabled           N/A
eth1         10.10.0.11:0            Enabled            Merge capable
eth2         10.10.0.11:0            Enabled            Merge capable
vmnet1        10.10.0.11:0           Disabled            N/A
```

The following is a sample output from the `show ldp interface IFNAME` command displaying information about the specified interface `eth1`.

```
#show ldp interface eth1
Status                  : Enabled
Primary IP Address      : 192.168.3.4
Interface Type          : Ethernet
Label Merge Capability  : Merge Capable
Hello Interval          : 5
Targeted Hello Interval : 15
Hold Time               : 15
Targeted Hold Time      : 45
Keepalive Interval      : 10
Keepalive Timeout       : 30
Advertisement Mode      : Downstream On Demand
Label Retention Mode    : Liberal
Administrative Groups   : ipi1
```

show ldp lsp

Use this command to display LDP LSP and, optionally, advertise-label information.

Command Syntax

```
show ldp lsp
show ldp lsp prefix detail
show ldp lsp (host|prefix|cr-lsp|detail)
```

Parameter

`host`	Display host LSP.
`prefix`	Displays advertise-label information in addition to LDP LSP information.
`cr-lsp`	Constraint-based routing LSP information.
`detail`	Displays advertise-label information in addition to LDP LSP information.

Command Mode

Exec mode and Privileged Exec mode

Example

The following is a sample output from the `show ldp lsp prefix detail` command displaying LDP LSP prefix information with advertise-label information.

```
#show ldp lsp prefix detail
Advertisement spec:
    Prefix acl = pfx1; Peer acl = pfx1
    Prevent the distribution of any assigned labels

FEC IPV4:1.1.1.0/30 -> 0.0.0.0
  Downstream state: Established Label: impl-null RequestID: 0 Peer:
50.50.50.50
Attr:
  Advert acl(s): Prevent the distribution of any assigned labels
FEC IPV4:3.3.3.0/30 -> 0.0.0.0
  Advert acl(s): Prevent the distribution of any assigned labels
FEC IPV4:10.30.0.0/24 -> 0.0.0.0
  Downstream state: Established Label: impl-null RequestID: 0 Peer:
50.50.50.50
Attr:
  Advert acl(s): Prevent the distribution of any assigned labels
FEC IPV4:50.50.50.50/32 -> 1.1.1.1
  Advert acl(s): Prefix acl = pfx1; Peer acl = pfx1
FEC IPV4:55.55.55.55/32 -> 3.3.3.2
  Advert acl(s): Prevent the distribution of any assigned labels
FEC IPV4:169.254.0.0/16 -> 0.0.0.0
  Downstream state: Established Label: impl-null RequestID: 0 Peer:
50.50.50.50
Attr:
  Advert acl(s): Prevent the distribution of any assigned labels
```

show ldp mpls-l2-circuit

Use this command to display summarized Layer-2 Virtual Circuit information about all MPLS virtual circuits configured on the current LSR. When the Virtual Circuit ID is specified, this command displays summarized information for the Virtual Circuit matching the specified ID only.

Command Syntax

```
show ldp mpls-l2-circuit
show ldp mpls-l2-circuit <1-4294967295>
show ldp mpls-l2-circuit detail
show ldp mpls-l2-circuit <1-4294967295> detail
```

Parameter

`<1-4294967295>`	Indicates the virtual circuit ID.
`detail`	Displays detailed LDP information.

Command Mode

Exec mode and Privileged Exec mode

Example

The following is a sample output of this command displaying summarized information of VID 1000:

```
#show ldp mpls-l2-circuit 1000
Transport Client     VC     Trans    Local       Remote      Destination
VC ID     Binding    State  Type     VC Label    VC Label    Address
1000      eth2       UP     ethernet 640         640         192.168.0.80

#show ldp mpls-l2-circuit
Transport Client     VC     Trans    Local       Remote      Destination
VC ID     Binding    State  Type     VC Label    VC Label    Address
1000      eth2       UP     ethernet 640         640         192.168.0.80
2000      eth3       UP     ethernet 641         648         192.168.0.80
3000      eth4       UP     ethernet 642         645         192.168.0.90
```

The following is a sample output of this command when using the `detail` parameter:

```
#show ldp mpls-l2-circuit detail
vcid: 100, type: ethernet, local groupid: 4, remote groupid: 4 (vc is up)
destination: 10.0.0.2, Peer LDP Ident: 10.0.0.2
Local label: 53120, remote label: 53120
Access IF: eth3, Network IF: eth4
Local MTU: 1500, Remote MTU: 1500
Local Control Word: 0, Remote Control Word: 0
Local PW Status Capability : enabled
Remote PW Status Capability : enabled
Current PW Status TLV : enabled
Local PW Status :
Not Forwarding
Remote PW Status :
Not Forwarding
Standby
```

show ldp ms-pw

Use this command to display Multi-Segment pseudowire information for LDP LSP.

Command Syntax

```
show ldp ms-pw NAME
```

Parameter

NAME	Display the Multi-Segment pseudowire name.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#show ldp ms-pw new-123

#
```

show ldp routes

Use this command to display LDP routes.

Command Syntax

```
show ldp routes
```

Parameter

None

Command Mode

Exec mode and Privileged Exec mode

Example

```
#show ldp routes
Prefix: 0.0.0.0/0   Nexthop: 10.0.2.2   IFINDEX: 2
Prefix: 1.1.1.1/32   Nexthop: 20.0.0.1   IFINDEX: 3
Prefix: 2.2.2.2/32   Nexthop: 0.0.0.0   IFINDEX: 1
Prefix: 3.3.3.3/32   Nexthop: 30.0.0.2   IFINDEX: 4
Prefix: 4.4.4.4/32   Nexthop: 40.0.0.2   IFINDEX: 5
Prefix: 5.5.5.5/32   Nexthop: 30.0.0.2   IFINDEX: 4
                     Nexthop: 40.0.0.2   IFINDEX: 5
Prefix: 20.0.0.0/24   Nexthop: 0.0.0.0   IFINDEX: 3
Prefix: 30.0.0.0/24   Nexthop: 0.0.0.0   IFINDEX: 4
Prefix: 40.0.0.0/24   Nexthop: 0.0.0.0   IFINDEX: 5
Prefix: 50.0.0.0/24   Nexthop: 30.0.0.2   IFINDEX: 4
Prefix: 60.0.0.0/24   Nexthop: 40.0.0.2   IFINDEX: 5
```

show ldp session

Use this command to display all sessions established between the current LSR and other LSRs. Use the IP address parameter to display detailed information for established sessions with the peer having the specified IPv4 or IPv6 address.

Command Syntax

```
show ldp session
show ldp session A.B.C.D
show ldp session X:X::X:X
```

Parameter

A.B.C.D	The IPv4 address of the peer for which information is to be shown.
X:X::X:X	The IPv6 address of the peer for which information is to be shown.

Command Mode

Exec mode and Privileged Exec mode

Example

The following is an output from the show ldp session command displaying detailed information about established sessions with the peer, 192.168.3.5.

```
#show ldp session 192.168.3.5
Session state         : OPERATIONAL
Session role          : Passive
TCP Connection        : Established
IP Address for TCP    : 192.168.3.5
Interface being used  : eth1
Peer LDP ID           : 10.10.0.18:0
Peer Password : mypwd
Authentication type: MD5
Adjacencies           : 192.168.3.5
                        192.168.4.5
Advertisement mode    : Downstream Unsolicited
Label retention mode  : Liberal
Keepalive Timeout     : 30
Reconnect Interval    : 15
Address List received : 192.168.3.5
                        192.168.4.5
Received Labels :      Fec       Label      Maps To
                       IPV4:10.10.0.0/24    impl-null none
                       IPV4:192.168.3.0/24  impl-null none
                       IPV4:192.168.4.0/24  impl-null none
                       IPV4:192.168.5.0/24  impl-null none
Sent Labels :          Fec                  LabelMaps To
                       IPV4:10.10.0.0/24    impl-null none
                       IPV4:192.168.3.0/24  impl-null none
                       IPV4:192.168.4.0/24  impl-null  none
```

show ldp statistics

Use this command to display LDP statistics.

Command Syntax

```
show ldp statistics
```

Parameter

None

Command Mode

Exec mode and Privileged Exec mode

Example

The following is a sample output from the `show ldp statistics` command.

```
#show ldp statistics

=======================================================
 LSR ID = 0.0.0.0:0 : TARGETED PEER: 10.10.10.10
=======================================================
  PacketType                      Total
                             Sent       Received
  Notification                 0            0
  Hello                        0            0
  Initialization               0            0
  Keepalive                    0            0
  Address                      0            0
  Address Withdraw             0            0
  Label Mapping                0            0
  Label Request                0            0
  Label Withdraw               0            0
  Label Release                0            0
  Request Abort                0            0
=======================================================
#
```

show ldp statistics advertise-labels

Use this command to display the count per each operation filtered by an advertisement list.

Command Syntax

```
show ldp statistics advertise-labels
```

Parameter

None

Command Mode

Exec mode and Privileged Exec mode

Example

The following is a sample output from the `show ldp statistics advertise-labels` command.

```
#show ldp statistics advertise-labels
Advertisement spec:
    Prefix acl = pfx1; Peer acl = pfx1
      Deny : Label Mapping = 2
             Label Request = 0
    Prevent the distribution of any assigned labels
      Deny : Label Mapping = 9
             Label Request = 3
#
```

show ldp targeted-peers

Use this command to display the list of targeted peers configured on the current LSR.

Command Syntax

```
show ldp targeted-peers
```

Parameter

None

Command Mode

Exec mode and Privileged Exec mode

Example

The following is a sample output from the `show ldp targeted-peers` command.

```
#show ldp targeted-peers
IP Address          Interface

192.168.201.2       eth1

c0a8:c902::         eth1
```

show ldp upstream

Use this command to display the status of all upstream sessions and label information exchanged.

Command Syntax

```
show ldp upstream
```

Parameter

None

Command Mode

Exec mode and Privileged Exec mode

Example

The following is a sample output of the `show ldp upstream` command showing the status of all upstream sessions.

```
#show ldp upstream
Session peer 1.1.1.1:
  FEC                       State              Label     Req.ID    Attr
  60.0.0.0/24               Established          52486       0     None
  4.4.4.4/32                Established          52484       0     None
  50.0.0.0/24               Established          52483       0     None
  40.0.0.0/24               Established      impl-null       0     None
  30.0.0.0/24               Established      impl-null       0     None
  20.0.0.0/24               Established      impl-null       0     None
  10.0.2.0/24               Established      impl-null       0     None
  5.5.5.5/32                Established          52482       0     None
  3.3.3.3/32                Established          52481       0     None
  2.2.2.2/32                Established      impl-null       0     None
Session peer 3.3.3.3:
  FEC                       State              Label     Req.ID    Attr
  60.0.0.0/24               Established          52487       0     None
  4.4.4.4/32                Established          52485       0     None
  1.1.1.1/32                Established          52480       0     None
  40.0.0.0/24               Established      impl-null       0     None
  30.0.0.0/24               Established      impl-null       0     None
  20.0.0.0/24               Established      impl-null       0     None
  10.0.2.0/24               Established      impl-null       0     None
  2.2.2.2/32                Established      impl-null       0     None
Session peer 4.4.4.4:
  FEC                       State              Label     Req.ID    Attr
  50.0.0.0/24               Established          52483       0     None
  40.0.0.0/24               Established      impl-null       0     None
  30.0.0.0/24               Established      impl-null       0     None
  20.0.0.0/24               Established      impl-null       0     None
  10.0.2.0/24               Established      impl-null       0     None
  3.3.3.3/32                Established          52481       0     None
  2.2.2.2/32                Established      impl-null       0     None
  1.1.1.1/32                Established          52480       0     None
```

show ldp vpls

Use this command to display information about all VPLS instances. Specify the VPLS ID to display information about a specific VPLS instance.

Command Syntax

```
show ldp vpls <1-4294967295>
show ldp vpls detail
show ldp vpls (no-vc|)
```

Parameter

`<1-4294967295>`	Display the VPLS identifier.
`detail`	Display detailed LDP VPLS information.
`no-vc`	Specify not display L2VC information.

Command Mode

Exec mode and Privileged Exec mode

Example

The following is a sample output of the `show ldp vpls` command displaying information about all VPLS instances.

```
#show ldp vpls
VPLS-ID     Peer Address      State  Type       Label-Sent   Label-Rcvd
1           192.168.0.80      Up     vpls       16           640
1           192.168.0.90      Up     vpls       18           642
2           192.168.0.80      Up     vpls       19           641
2           192.168.0.90      Up     vpls       17           643
```

The following is an output of the `show ldp vpls detail` command:

```
#show ldp vpls detail
 VPLS Identifier    : 1
 Peer IP            : 192.168.0.80
 VC State           : UP
 VC Type            : vpls
 VC Label Sent      : 16
 VC Label Received  : 640

 VPLS Identifier    : 1
 Peer IP            : 192.168.0.90
 VC State           : UP
 VC Type            : vpls
 VC Label Sent      : 18
 VC Label Received  : 642

 VPLS Identifier    : 2
 Peer IP            : 192.168.0.80
 VC State           : UP
 VC Type            : vpls
 VC Label Sent      : 19
 VC Label Received  : 641
```

show mpls ldp discovery

Use this command to display the list of interfaces on the current LSR, and to indicate whether a given interface is label-switching or not.

Command Syntax

```
show mpls ldp discovery IFNAME
```

Parameter

`IFNAME`	Display an interface name.

Command Mode

Exec mode and Privileged Exec mode

Example

The following is an output from the `show mpls ldp discovery` command displaying the list of interfaces on the current LSR.

```
#show mpls ldp discovery
Interface           LDP Identifier           Label-switching Merge Capability
eth0                10.10.0.11:0             Disabled        N/A
lo                  10.10.0.11:0             Disabled        N/A
eth1                10.10.0.11:0             Enabled         Merge capable
eth2                10.10.0.11:0             Enabled         Merge capable
vmnet1              10.10.0.11:0             Disabled         N/A
```

show mpls ldp fec

Use this command to display a list of FECs (Forwarding Equivalence Class) and corresponding label information.

Command Syntax

```
show mpls ldp fec (prefix|cr-lsp)
```

Parameter

`prefix`	This indicates the prefix FEC.
`cr-lsp`	Constraint-based routing LSP information.

Command Mode

Exec mode and Privileged Exec mode

Example

The following is a sample output from the `show mpls ldp fec` command displaying a list of FECs.

```
#show ldp fec
LSR codes    : E/N - LSR is egress/non-egress for this FEC,
               L - LSR received a label for this FEC,
               > - LSR will use this route for the FEC
FEC                    Code    Session         Out Label       Nexthop Addr
1.1.1.1/32             NL>     1.1.1.1         impl-null       20.0.0.1
2.2.2.2/32             E >     non-existent    none            connected
3.3.3.3/32             NL>     3.3.3.3         impl-null       30.0.0.2
4.4.4.4/32             NL>     4.4.4.4         impl-null       40.0.0.2
5.5.5.5/32             NL>     4.4.4.4         impl-null       40.0.0.2
                       NL>     3.3.3.3         impl-null       30.0.0.2
20.0.0.0/24            NL      1.1.1.1         impl-null       invalid
                       E >     non-existent    none            connected
30.0.0.0/24            NL      3.3.3.3         impl-null       invalid
                       E >     non-existent    none            connected
40.0.0.0/24            NL      4.4.4.4         impl-null       invalid
                       E >     non-existent    none            connected
50.0.0.0/24            NL      4.4.4.4         impl-null       invalid
                       NL>     3.3.3.3         impl-null       30.0.0.2
60.0.0.0/24            NL>     4.4.4.4         impl-null       40.0.0.2
                       NL      3.3.3.3         impl-null       invalid
```

show mpls ldp graceful-restart

Use this command to show all LDP session graceful-restart related values.

Command Syntax

```
show mpls ldp graceful-restart
```

Parameter

None

Command Mode

Exec mode and Privileged Exec mode

Example

The following is a sample output from the `show mpls ldp graceful-restart` command.

```
#show mpls ldp graceful-restart
Peer IP Address     IF Name     Restart     My State    No Timers Running
192.168.201.3       eth3        Not Capable OPERATIONAL        0
192.168.201.4       eth4        Capable     OPERATIONAL        0
```

show mpls ldp neighbor

Use this command to display all the adjacencies for this LSR.

Command Syntax

```
show mpls ldp neighbor detail
```

Parameter

`detail`	Displays details of the LSR adjacencies.

Command Mode

Exec mode and Privileged Exec mode

Example

The following is an output from the show mpls ldp neighbor command displaying all the adjacencies for this LSR.

```
#show mpls ldp neighbor
IP Address            Interface Name    Holdtime    LDP ID
192.168.3.5           eth1              15          10.10.0.18:0
192.168.4.5           eth2              15          10.10.0.18:0
```

show mpls ldp parameter

Use this command to display LDP attributes assigned for this LSR.

Command Syntax

```
show mpls ldp parameter
```

Parameter

None

Command Mode

Exec mode and Privileged Exec mode

Example

The following is an output from the `show mpls ldp parameter` displaying LDP attributes assigned to this LSR.

```
#show mpls ldp parameter
Router ID                 : 0.0.0.0
LDP Version               : 1
Global Merge Capability   : Merge Capable
Label Advertisement Mode  : Downstream Unsolicited
Label Retention Mode      : Liberal
Label Control Mode        : Independent
Instance Loop Detection   : Off
Request Retry             : Off
Propagate Release         : Disabled
Graceful Restart          : Disabled
Hello Interval            : 5
Targeted Hello Interval   : 15
Hold time                 : 15
Targeted Hold time        : 45
Keepalive Interval        : 10
Keepalive Timeout         : 30
Request retry Timeout     : 5
Transport Address data    :
  Labelspace 0            : 192.168.201.2 (not in use)
Import BGP routes         : No
```

show mpls ldp session

Use this command to display LDP session information.

Command Syntax

```
show mpls ldp session A.B.C.D
show mpls ldp session X:X::X:X
```

Parameter

A.B.C.D	The IPv4 address of the peer for which information is to be shown.
X:X::X:X	The IPv6 address of the peer for which information is to be shown.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#show mpls ldp session 10.10.0.5
```

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