

## Configuring LDP with CLI

This section provides information to configure LDP using the command line interface.

Topics in this section include:

- [LDP Configuration Overview on page 646](#)
- [Basic LDP Configuration on page 647](#)
- [Common Configuration Tasks on page 648](#)
- [LDP Configuration Management Tasks on page 660](#)

## LDP Configuration Overview

When the implementation of LDP is instantiated, the protocol is in the `no shutdown` state. In addition, targeted sessions are then enabled. The default parameters for LDP are set to the documented values for targeted sessions in *draft-ietf-mpls-ldp-mib-09.txt*.

LDP must be enabled in order for signaling to be used to obtain the ingress and egress labels in frames transmitted and received on the service distribution path (SDP). When signaling is *off*, labels must be manually configured when the SDP is bound to a service.

## Basic LDP Configuration

This chapter provides information to configure LDP and remove configuration examples of common configuration tasks.

The LDP protocol instance is created in the `no shutdown` (enabled) state.

The following displays the default LDP configuration.

```
A:ALA-1>config>router>ldp# info
-----
      session-parameters
      exit
      interface-parameters
      exit
      targeted-session
      exit
      no shutdown
-----
A:ALA-1>config>router>ldp#

A:ALU_SIM11>config>router>ldp# info
-----
      aggregate-prefix-match
      prefix-exclude "sample"
      exit
      graceful-restart
      exit
      peer-parameters
      peer 1.1.1.1
      ttl-security 1
      exit
      exit
      interface-parameters
      interface "a"
      exit
      exit
      targeted-session
      exit
-----
A:ALU_SIM11>config>router>ldp#
```

## Common Configuration Tasks

This section provides information to configure:

- [Enabling LDP on page 648](#)
- [Configuring FEC Originate Parameters on page 650](#)
- [Configuring Graceful-Restart Helper Parameters on page 651](#)
- [Applying Export and Import Policies on page 652](#)
- [Targeted Session Parameters on page 653](#)
- [Interface Parameters on page 655](#)
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### Enabling LDP

LDP must be enabled in order for the protocol to be active. MPLS does not need to be enabled on the router except if the network interface uses the Packet over Sonet (POS) encapsulation (Sonet path encapsulation type set to ppp-auto). In this case, MPLS must be enabled and the interface name added into MPLS to allow for the MPLSCP to come up on the PPP link between the two peers and for MPLS to be used on the interface. MPLS is enabled in the `config>router>mpls` context.

Use the following syntax to enable LDP on a router:

**CLI Syntax:** `ldp`

**Example:** `config>router# ldp`

The following displays the enabled LDP configuration.

```
A:ALA-1>config>router# info
-----
...
#-----
echo "LDP Configuration"
#-----
      ldp
        session-parameters
        exit
        interface-parameters
        exit
        targeted-session
        exit
      exit
-----
```

```
...  
A:ALA-1>config>router#
```

## Configuring FEC Originate Parameters

A FEC can be added to the LDP IP prefix database with a specific label operation on the node. Permitted operations are pop or swap. For a swap operation, an incoming label can be swapped with a label in the range of 16 to 1048575. If a swap-label is not configured then the default value is 3.

A route table entry is required for a FEC with a pop operation to be advertised. For a FEC with a swap operation, a route-table entry must exist and user configured next-hop for swap operation must match one of the next-hops in route-table entry.

Use the following syntax to configure FEC originate parameters:

**CLI Syntax:**

```
config>router>ldp
    fec-originate ip-prefix/mask [advertised-label in-label]
    next-hop ip-address [swap-label out-label]
    fec-originate ip-prefix/mask [advertised-label in-label] pop
```

The following displays a FEC originate configuration example.

```
A:ALA-5>config>router# info
-----
    fec-originate 100.1.1.1/32 pop
    fec-originate 100.2.1.1/32 advertised-label 1000 next-hop 10.10.1.2
    fec-originate 100.3.1.1/32 advertised-label 1001 next-hop 10.10.2.3
    swap-label 131071
    session-parameters
    exit
    interface-parameters
    exit
    targeted-session
    exit
    exit
-----
A:ALA-5>config>router>ldp#
```

## Configuring Graceful-Restart Helper Parameters

Graceful-restart helper advertises to its LDP neighbors by carrying the fault tolerant (FT) session TLV in the LDP initialization message, assisting the LDP in preserving its IP forwarding state across the restart. Alcatel-Lucent's recovery is self-contained and relies on information stored internally to self-heal. This feature is only used to help third-party routers without a self-healing capability to recover.

Maximum recovery time is the time (in seconds) the sender of the TLV would like the receiver to wait, after detecting the failure of LDP communication with the sender.

Neighbor liveness time is the time (in seconds) the LSR is willing to retain its MPLS forwarding state. The time should be long enough to allow the neighboring LSRs to re-sync all the LSPs in a graceful manner, without creating congestion in the LDP control plane.

Use the following syntax to configure graceful-restart parameters:

**CLI Syntax:** `config>router>ldp`  
`[no] graceful-restart`

## Applying Export and Import Policies

Both inbound and outbound label binding filtering are supported. Inbound filtering allows a route policy to control the label bindings an LSR accepts from its peers. An import policy can accept or reject label bindings received from LDP peers.

Label bindings can be filtered based on:

- Neighbor — Match on bindings received from the specified peer.
- Interface — Match on bindings received from a neighbor or neighbors adjacent over the specified interface.
- Prefix-list — Match on bindings with the specified prefix/prefixes.

Outbound filtering allows a route policy to control the set of LDP label bindings advertised by the LSR. An export policy can control the set of LDP label bindings advertised by the router. By default, label bindings for only the system address are advertised and propagate all FECs that are received. Matches can be based on:

- Loopback — loopback interfaces.
- All — all local subnets.
- Match — match on bindings with the specified prefix/prefixes.

Use the following syntax to apply import and export policies:

**CLI Syntax:**

```
config>router>ldp
    export policy-name [policy-name...(upto 32 max)]
    import policy-name [policy-name...(upto 32 max)]
```

The following displays export and import policy configuration examples.

```
A:ALA-1>config>router# info
-----
    export "LDP-export"
    fec-originate 100.1.1.1/32 pop
    fec-originate 100.2.1.1/32 advertised-label 1000 next-hop 10.10.1.2
    import "LDP-import"
    session-parameters
    exit
    interface-parameters
    exit
    targeted-session
    exit
-----
A:ALA-1>config>router#
```



## Targeted Session Parameters

Use the following syntax to specify **targeted-session** parameters:

**CLI Syntax:**

```
config>router# ldp
  targeted-session
  disable-targeted-session
  export-prefixes policy-name [policy-name...(up to 5 max)]
  ipv4
    hello timeout factor
    keepalive timeout factor
  import-prefixes policy-name [policy-name...(up to 5 max)]
  peer ip-address
    hello timeout factor
    keepalive timeout factor
  no shutdown
  tunneling
    lsp lsp-name
```

The following example displays an LDP configuration example:

```
A:ALA-1>config>router>ldp# info
-----
...
    targeted-session
    ipv4
        hello 120 3
        keepalive 120 3
    exit
    peer 10.10.10.104
        hello 240 3
        keepalive 240 3
    exit
    exit
-----
A:ALA-1>config>router>ldp#
```



## Interface Parameters

Use the following syntax to configure interface parameters:

**CLI Syntax:**

```
config>router# ldp
  interface-parameters
    interface ip-int-name [dual stack]
      bfd-enable [ipv4][ipv6]
      ipv4/ipv6
        hello timeout factor
        keepalive timeout factor
        transport-address {system|interface}
      no shutdown
    ipv4/ipv6
      hello timeout factor
      keepalive timeout factor
      transport-address {system|interface}
```

The following example displays an interface parameter configuration example:

```
A:ALA-1>config>router>ldp# info
-----
...
      interface-parameters
        interface "to-DUT1" dual-stack
          ipv4
            hello 240 3
            keepalive 240 3
          exit
        exit
      exit
    -----
A:ALA-1>config>router>ldp#
```

## Session Parameters

Use the following syntax to specify interface parameters:

**CLI Syntax:** config>router# ldp  
 session-parameters  
 peer *ip-address*  
 auth-keychain *name*  
 authentication-key [*authentication-key*|*hash-key*]  
 [*hash*|*hash2*]  
 ttl-security *min-ttl-value* [*log log-id*]

The following example displays an LDP configuration example:

```
A:ALA-1>config>router>ldp# info
-----
export "LDP-export"
import "LDP-import"
session-parameters
  peer 1.1.1.1
  exit
  peer 10.10.10.104
  exit
exit
tcp-session-parameters
  peer-transport 10.10.10.104
  authentication-key "E7GtYNZHTAaQqVMRDbfNIZpLtHg4ECok" hash2
  exit
exit
interface-parameters
  interface "to-DUT1" dual-stack
  ipv4
    hello 240 3
    keepalive 240 3
  exit
exit
targeted-session
  ipv4
    hello 120 3
    keepalive 120 3
  exit
  peer 10.10.10.104
  hello 240 3
  keepalive 240 3
  exit
exit
-----
A:ALA-1>config>router>ldp#
```

## LDP Signaling and Services

When LDP is enabled, targeted sessions can be established to create remote adjacencies with nodes that are not directly connected. When service distribution paths (SDPs) are configured, extended discovery mechanisms enable LDP to send periodic targeted hello messages to the SDP far-end point. The exchange of LDP hellos trigger session establishment. The SDP signaling default enables **tldp**. The service SDP uses the targeted-session parameters configured in the **config>router>ldp>targeted-session** context.

The SDP LDP and LSP commands are mutually exclusive; either one LSP can be specified or LDP can be enabled. If LDP is already enabled on an MPLS SDP, then an LSP cannot be specified on the SDP. If an LSP is specified on an MPLS SDP, then LDP cannot be enabled on the SDP.

To enable LDP on the SDP when an LSP is already specified, the LSP must be removed from the configuration using the **no lsp *lsp-name*** command. For further information about configuring SDPs, refer to the SR OS Services Guide.

The 7210 SAS M supports only Targeted LDP (TLDP).

The following example displays the command syntax usage to configure enable LDP on an MPLS SDP:

**CLI Syntax:**

```
config>service>sdp#
  ldp
  signaling {off|tldp}
```

The following displays an example of an SDP configuration showing the signaling default **tldp** enabled.

```
A:ALA-1>config>service>sdp# info detail
-----
description "MPLS: to-99"
far-end 10.10.10.99
ldplsp A_D_1
signaling tldp
path-mtu 4462
keep-alive
  hello-time 10
  hold-down-time 10
  max-drop-count 3
  timeout 5
  no message-length
  no shutdown
exit
no shutdown
-----
A:ALA-1>config>service>sdp#
```

The following shows a working configuration of LDP over RSVP-TE (1) where tunnels look like the second example (2):

```
1. *A:ALA-1>config>router>ldp# info
-----
prefer-tunnel-in-tunnel
interface-parameters
  interface "port-1/1/3"
  exit
  interface "port-lag-1"
  exit
exit
targeted-session
  peer 10.51.0.1
  shutdown
  tunneling
    lsp "to_P_1"
  exit
  peer 10.51.0.17
  shutdown
  tunneling
    lsp "to_P_6"
  exit
exit
exit
-----
*A:ALA-1>config>router>ldp#
```

```
2. ALA-1>config>router>if-attr# info
-----

admin-group "lower" value 2
admin-group "upper" value 1
-----
*A:ALA-1>config>router>mpls# info
-----

resignal-timer 30
interface "system"
exit
interface "port-1/1/3"
exit
interface "port-lag-1"
exit
path "dyn"
  no shutdown
exit
lsp "to_P_1"
  to 10.51.0.1
  cspf
  fast-reroute facility
  exit
  primary "dyn"
  exit
  no shutdown
exit
-----
```

```
lsp "to_P_6"  
  to 10.51.0.17  
  cspf  
  fast-reroute facility  
  exit  
  primary "dyn"  
  exit  
  no shutdown  
exit  
no shutdown  
-----  
*A:ALA-1>config>router>mpls#
```

## LDP Configuration Management Tasks

This section discusses the following LDP configuration management tasks:

- [Disabling LDP on page 660](#)
  - [Modifying Targeted Session Parameters on page 661](#)
  - [Modifying Interface Parameters on page 662](#)
  - [Modifying Interface Parameters on page 662](#)
- 

### Disabling LDP

The **no ldp** command disables the LDP protocol on the router. All parameters revert to the default settings. LDP must be shut down before it can be disabled.

Use the following command syntax to disable LDP:

**CLI Syntax:** `no ldp  
shutdown`



## Modifying Targeted Session Parameters

The modification of LDP targeted session parameters does not take effect until the next time the session goes down and is re-establishes. Individual parameters cannot be deleted. The `no` form of a **targeted-session** parameter command reverts modified values back to the default. Different default parameters can be configured for IPv4 and IPv6 LDP targeted hello adjacencies.

The following example displays the command syntax usage to revert targeted session parameters back to the default values:

### Example :

```
config>router# ldp
config>router>ldp# targeted-session
config>router>ldp>tcp-session-parameters>peer# no authentication-key
config>router>ldp>targ-session# no disable-targeted-session
config>router>ldp>targ-session>ipv4# no hello
config>router>ldp>targ-session>ipv4# no keepalive
config>router>ldp>targ-session# no peer 10.10.10.104
```

The following output displays the default values:

```
A:ALA-1>config>router>ldp>targeted# info detail
-----
      no disable-targeted-session
      no import-prefixes
      no export-prefixes
      ipv4
         no hello
         no keepalive
         no hello-reduction
      exit
      ipv6
         no hello
         no keepalive
         no hello-reduction
      exit
-----
A:ALA-1>config>router>ldp>targeted#
```

## Modifying Interface Parameters

Individual parameters cannot be deleted. The **no** form of a **interface-parameter** command reverts modified values back to the defaults.

The following output displays the default values:

```
A:ALA-1>config>router>ldp>if-params>if# info detail
-----
          no bfd-enable
          ipv4
            no hello
            no keepalive
            no local-lsr-id
            fec-type-capability
              p2mp-ipv4 enable
            exit
            no transport-address
            no shutdown
          exit
          no shutdown
-----
```