Configuring MPLS LDP Autoconfiguration

This chapter describes how to configure Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) autoconfiguration on Cisco NX-OS devices.

This chapter includes the following sections:

• Finding Feature Information, page 4-1
• Information About MPLS LDP Autoconfiguration, page 4-1
• Licensing Requirements for MPLS LDP Autoconfiguration, page 4-2
• Prerequisites for MPLS LDP Autoconfiguration, page 4-2
• Guidelines and Limitations for MPLS LDP Autoconfiguration, page 4-2
• Default Settings for MPLS LDP Autoconfiguration, page 4-2
• Configuring MPLS LDP Autoconfiguration, page 4-3
• Verifying the MPLS LDP Autoconfiguration, page 4-6
• Configuration Examples for MPLS LDP Autoconfiguration, page 4-6
• Additional References for MPLS LDP Autoconfiguration, page 4-8
• Feature History for MPLS LDP Autoconfiguration, page 4-9

Finding Feature Information

Your software release might not support all the features documented in this module. For the latest caveats and feature information, see the Bug Search Tool at https://tools.cisco.com/bugsearch/ and the release notes for your software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the “New and Changed Information” chapter or the Feature History table below.

Information About MPLS LDP Autoconfiguration

The MPLS LDP autoconfiguration feature enables you to globally configure LDP on every interface associated with a specified Interior Gateway Protocol (IGP) instance.

To enable LDP, you should configure it globally and on each interface where it is needed. Configuring LDP on many interfaces can be time consuming.
The MPLS LDP autoconfiguration feature is supported on Open Shortest Path First (OSPF) and Intermediate System-to-System (IS-IS) IGPs. Because you do not have to configure LDP separately on each interface, the autoconfiguration feature makes LDP configuration easier, faster, and error free. If desired, you can also disable LDP on selected interfaces after autoconfiguration is enabled.

**Licensing Requirements for MPLS LDP Autoconfiguration**

**Prerequisites for MPLS LDP Autoconfiguration**

MPLS LDP autoconfiguration has the following prerequisites:

- You must enable MPLS LDP.

**Guidelines and Limitations for MPLS LDP Autoconfiguration**

MPLS LDP autoconfiguration has the following configuration guidelines and limitations:

- This feature is supported only on interfaces that are running OSPF or IS-IS processes. Other IGPs are not supported.
- If you disable LDP globally, autoconfiguration fails and generates a console message explaining that you must first enable LDP globally.
- If MPLS LDP autoconfiguration is configured for an IGP instance, you cannot enter the global `shutdown` command. To disable LDP, you must first enter the `no mpls ldp igp autoconfig` command.
- This feature is not supported on traffic engineering (TE) tunnel interfaces.

**Default Settings for MPLS LDP Autoconfiguration**

Table 4-1 lists the default settings for MPLS LDP autoconfiguration parameters.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPLS LDP autoconfiguration</td>
<td>Disabled</td>
</tr>
</tbody>
</table>
Configuring MPLS LDP Autoconfiguration

This section includes the following topics:

- Configuring MPLS LDP Autoconfiguration for OSPF Interfaces, page 4-3
- Configuring MPLS LDP Autoconfiguration for IS-IS Interfaces, page 4-4
- Disabling MPLS LDP Autoconfiguration for Selected OSPF or IS-IS Interfaces, page 4-5

Configuring MPLS LDP Autoconfiguration for OSPF Interfaces

You can configure MPLS LDP autoconfiguration for all interfaces that run OSPF processes. As a result, all interfaces that belong to an OSPF area are enabled for LDP.

Prerequisites

Ensure that you are in the correct VDC (or use the `switchto vdc` command).

Ensure that OSPF is enabled. (You can enable it using the `feature ospf` command.)

Ensure that MPLS LDP is enabled.

SUMMARY STEPS

1. `configure terminal`
2. `router ospf process-name`
3. `mpls ldp autoconfig area area-id`
4. (Optional) `show mpls ldp discovery detail`
5. (Optional) `copy running-config startup-config`

DETAILED STEPS

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Example: switch# configure terminal switch(config)#</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong> router ospf process-name</td>
<td>Enables an OSPF routing process and enters router configuration mode.</td>
</tr>
<tr>
<td>Example: switch(config)# router ospf p1 switch(config-router)#</td>
<td>You can enter up to 20 alphanumeric characters for the <code>process-name</code> argument.</td>
</tr>
<tr>
<td><strong>Step 3</strong> mpls ldp autoconfig area area-id</td>
<td>Enables MPLS LDP autoconfiguration for all OSPF interfaces.</td>
</tr>
<tr>
<td>Example: switch(config-router)# mpls ldp autoconfig area 10</td>
<td>For the <code>area-id</code> argument, you can specify the area ID as an integer (from 0 to 4,294,967,295) or an IP address.</td>
</tr>
</tbody>
</table>
## Configuring MPLS LDP Autoconfiguration for IS-IS Interfaces

You can configure MPLS LDP autoconfiguration for all interfaces that run IS-IS processes. As a result, all interfaces that belong to an IS-IS area are enabled for LDP.

### Prerequisites

Ensure that you are in the correct VDC (or use the `switch to vdc` command).

Ensure that IS-IS is enabled. (You can enable it using the `feature isis` command.)

Ensure that MPLS LDP is enabled.

### SUMMARY STEPS

1. `configure terminal`
2. `router isis process-name`
3. `mpls ldp autoconfig {level-1 | level-1-2 | level-2}`
4. (Optional) `show mpls ldp discovery detail`
5. (Optional) `copy running-config startup-config`

### DETAILED STEPS

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> <code>configure terminal</code></td>
<td>Enters global configuration mode.</td>
</tr>
</tbody>
</table>
| Example: switch# configure terminal  
switch(config)# | |
| **Step 2** `router isis process-name` | Enables an IS-IS routing process and enters router configuration mode. |
| Example: switch(config)# router isis pl  
switch(config-router)# | You can enter up to 20 alphanumeric characters for the `process-name` argument. |
Disabling MPLS LDP Autoconfiguration for Selected OSPF or IS-IS Interfaces

You can disable LDP for specific OSPF or IS-IS interfaces after they were configured with the MPLS LDP autoconfiguration feature.

Prerequisites

Ensure that you are in the correct VDC (or use the switch to vdc command).
Ensure that MPLS LDP is enabled.

SUMMARY STEPS

1. configure terminal
2. interface ethernet slot/port
3. no mpls ldp igp autoconfig
4. (Optional) show mpls ldp discovery detail
5. (Optional) copy running-config startup-config
Verifying the MPLS LDP Autoconfiguration

To display the MPLS LDP autoconfiguration, perform one of the following tasks:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show mpls ldp discovery detail</code></td>
<td>Displays the method used to enable LDP on an interface.</td>
</tr>
</tbody>
</table>

For detailed information about the fields in the output from these commands, see the *Cisco Nexus 7000 Series NX-OS MPLS Command Reference*.

Configuration Examples for MPLS LDP Autoconfiguration

This section provides configuration examples for MPLS LDP autoconfiguration and includes the following topics:

- Examples: Configuring MPLS LDP Autoconfiguration for OSPF Interfaces, page 4-7
- Examples: Configuring MPLS LDP Autoconfiguration for IS-IS Interfaces, page 4-8
Examples: Configuring MPLS LDP Autoconfiguration for OSPF Interfaces

The following example shows how to configure MPLS LDP autoconfiguration for OSPF interfaces and verify the results:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ip address 10.0.0.13 255.0.0.0
switch(config-if)# exit
switch(config)# router ospf 1
switch(config-router)# area 3 range 10.0.0.13 0.0.255.255
switch(config-router)# mpls ldp autoconfig area 3
switch(config-router)# show mpls ldp discovery detail
Local LDP Identifier: 10.0.0.13:0
Discovery Sources: Interfaces:
   Ethernet2/1 (ldp): xmit/recv
      Enabled: IGP config;
      Hello interval: 5000 ms; Transport IP addr: 10.0.0.13
      LDP Id: 10.0.0.21:0
      Src IP addr: 168.5.5.21; Transport IP addr: 10.0.0.21
      Hold time: 15 sec; Proposed local/peer: 15/15 sec
      Reachable via 10.0.0.21/32
      Password: not required, none, in use
      Clients: IPv4
   Ethernet2/6 (ldp): xmit/recv
      Enabled: Interface config, IGP config;
      Hello interval: 5000 ms; Transport IP addr: 10.0.0.13
      LDP Id: 10.0.0.22:0
      Src IP addr: 168.6.6.22; Transport IP addr: 10.0.0.22
      Hold time: 15 sec; Proposed local/peer: 15/15 sec
      Reachable via 10.0.0.22/32
      Password: not required, neighbor, in use
      Clients: IPv4
```

The following example shows how to disable LDP on a specific interface after it was enabled using the MPLS LDP autoconfiguration feature:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no mpls ldp igp autoconfig
switch(config-if)# show mpls ldp discovery detail
Local LDP Identifier: 10.0.0.13:0
Discovery Sources: Interfaces:
   Ethernet2/6 (ldp): xmit/recv
      Enabled: Interface config, IGP config;
      Hello interval: 5000 ms; Transport IP addr: 10.0.0.13
      LDP Id: 10.0.0.22:0
      Src IP addr: 168.6.6.22; Transport IP addr: 10.0.0.22
      Hold time: 15 sec; Proposed local/peer: 15/15 sec
      Reachable via 10.0.0.22/32
      Password: not required, neighbor, in use
      Clients: IPv4
```
Examples: Configuring MPLS LDP Autoconfiguration for IS-IS Interfaces

The following example shows how to configure MPLS LDP autoconfiguration for IS-IS interfaces and verify the results:

switch# configure terminal
switch(config)# interface ethernet 3/2
switch(config-if)# ip address 10.0.0.30 255.0.0.1
switch(config-if)# ip router isis pl
switch(config-if)# exit
switch(config-router)# router isis pl
switch(config-router)# mpls ldp autoconfig level-1-2
switch(config-router)# show mpls ldp discovery detail

Local LDP Identifier: 10.0.0.30:0
Discovery Sources:
Interfaces:
  Ethernet3/2 (ldp): xmit/recv
  Enabled: IGP config;
  Hello interval: 5000 ms; Transport IP addr: 10.0.0.30
  LDP Id: 10.0.0.31:0
  Src IP addr: 60.0.0.2; Transport IP addr: 10.0.0.31
  Hold time: 15 sec; Proposed local/peer: 15/15 sec
  Reachable via 10.0.0.31/32
  Password: not required, none, in use
  Clients: IPv4

Additional References for MPLS LDP Autoconfiguration

For additional information related to implementing MPLS LDP autoconfiguration, see the following sections:

- Related Documents, page 4-8
- MIBs, page 4-8

Related Documents

<table>
<thead>
<tr>
<th>Related Topic</th>
<th>Document Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLI commands</td>
<td>Cisco Nexus 7000 Series NX-OS MPLS Command Reference</td>
</tr>
</tbody>
</table>

MIBs

<table>
<thead>
<tr>
<th>MIB</th>
<th>MIBs Link</th>
</tr>
</thead>
</table>
| MPLS-LDP-STD-MIB | To locate and download MIBs, go to the following URL:  
Feature History for MPLS LDP Autoconfiguration

Table 4-2 lists the release history for this feature.

<table>
<thead>
<tr>
<th>Feature Name</th>
<th>Releases</th>
<th>Feature Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPLS LDP autoconfiguration</td>
<td>5.2(1)</td>
<td>This feature was introduced.</td>
</tr>
</tbody>
</table>