



MPLS LDP Autoconfiguration

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

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Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and 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 Feature Information Table at the end of this document.

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Restrictions for MPLS LDP Autoconfiguration

- In Cisco IOS Release 12.0(32)SY, the **mpls ldp autoconfig** command is supported only with OSPF. Other IGPs are not supported.
- If LDP is disabled globally, the **mpls ldp autoconfig** command fails and generates a console message explaining that LDP must first be enabled globally by means of the global **mpls ip** command.
- If the **mpls ldp autoconfig** command is configured for an IGP instance, you cannot issue the global **no mpls ip** command. To disable LDP, you must first issue the **no mpls ldp autoconfig** command.



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- For interfaces running IS-IS processes, you can enable Multiprotocol Label Switching (MPLS) for each interface, using the router mode command **mpls ldp autoconfig** or **mpls ldp igp autoconfig** at the interface level.
- You specify that the default label distribution protocol is LDP for a router or for an interface. Tag Distribution Protocol (TDP) is not supported.
- The MPLS LDP Autoconfiguration feature is not supported on traffic engineering tunnel interfaces.

Information About MPLS LDP--Autoconfiguration

- [MPLS LDP--Autoconfiguration Overview, page 2](#)

MPLS LDP--Autoconfiguration Overview

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 enables you to globally enable LDP on every interface associated with an IGP instance. This feature is supported on OSPF and IS-IS IGPs. Further, it provides a means to block LDP from being enabled on interfaces that you do not want enabled. The goal of the MPLS LDP--Autoconfiguration feature is to make configuration easier, faster, and error free.

You issue the **mpls ldp autoconfig** command to enable LDP on each interface that is running an OSPF or IS-IS process. If you do not want some of the interfaces to have LDP enabled, you can issue the **no** form of the **mpls ldp igp autoconfig** command on those interfaces.

How to Configure MPLS LDP Autoconfiguration

- [Configuring MPLS LDP-Autoconfiguration with OSPF Interfaces, page 2](#)
- [Disabling MPLS LDP Autoconfiguration from Selected OSPF Interfaces, page 5](#)
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Configuring MPLS LDP-Autoconfiguration with OSPF Interfaces

To configure MPLS LDP-Autoconfiguration with OSPF interfaces, perform the following steps.

SUMMARY STEPS

1. enable
2. configure terminal
3. mpls ip
4. mpls label protocol ldp
5. interface *type slot / subslot / port* [*, subinterface-number*]
6. ip address *prefix mask*
7. mpls ip
8. exit
9. router ospf *process-id*
10. network *ip-address wildcard-mask* area *area-id*
11. mpls ldp sync
12. exit
13. exit

DETAILED STEPS

| | Command or Action | Purpose |
|--------|---|---|
| Step 1 | <p>enable</p> <p>Example:</p> <pre>Router> enable</pre> | <p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> • Enter your password if prompted. |
| Step 2 | <p>configure terminal</p> <p>Example:</p> <pre>Router# configure terminal</pre> | <p>Enters global configuration mode.</p> |
| Step 3 | <p>mpls ip</p> <p>Example:</p> <pre>Router(config)# mpls ip</pre> | <p>Globally enables hop-by-hop forwarding.</p> |
| Step 4 | <p>mpls label protocol ldp</p> <p>Example:</p> <pre>Router(config)# mpls label protocol ldp</pre> | <p>Specifies LDP as the default label distribution protocol.</p> |

| | Command or Action | Purpose |
|----------------|---|--|
| Step 5 | interface <i>type slot / subslot / port</i> [<i>, subinterface-number</i>] Example: <pre>Router(config)# interface POS0/3/0</pre> | Specifies the interface to configure and enters interface configuration mode. |
| Step 6 | ip address <i>prefix mask</i> Example: <pre>Router(config-if)# ip address 10.25.0.11 255.255.255.255</pre> | Assigns an IP address to the interface. |
| Step 7 | mpls ip Example: <pre>Router(config-if)# mpls ip</pre> | Enables hop-by-hop forwarding on the interface. |
| Step 8 | exit Example: <pre>Router(config-if)# exit</pre> | Exits interface configuration mode. |
| Step 9 | router ospf <i>process-id</i> Example: <pre>Router(config)# router ospf 1</pre> | Enables OSPF routing and enters router configuration mode. |
| Step 10 | network <i>ip-address wildcard-mask area area-id</i> Example: <pre>Router(config-router)# network 10.0.0.0 0.255.255.255 area 3</pre> | Defines an interface on which OSPF runs and defines the area ID for that interface. |
| Step 11 | mpls ldp sync Example: <pre>Router(config-router)# mpls ldp sync</pre> | Enables MPLS LDP-IGP synchronization for interfaces for an OSPF or an IS-IS process. |

| Command or Action | Purpose |
|---|---|
| Step 12 <code>exit</code> Example: <pre>Router(config-router)# exit</pre> | Exits router configuration mode and returns to global configuration mode. |
| Step 13 <code>exit</code> Example: <pre>Router(config)# exit</pre> | Exits global configuration mode and returns to privileged EXEC mode. |

Disabling MPLS LDP Autoconfiguration from Selected OSPF Interfaces

When you issue the **mpls ldp autoconfig** command, all the interfaces that belong to an OSPF area are enabled for LDP. To remove LDP from some interfaces, use the **no mpls ldp igp autoconfig** command on those interfaces. The following configuration steps show how to disable LDP from some of the interfaces after they were configured with the MPLS LDP Autoconfiguration feature with the **mpls ldp autoconfig** command.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **no mpls ldp igp autoconfig**
5. **end**

DETAILED STEPS

| Command or Action | Purpose |
|---|--|
| Step 1 <code>enable</code> Example: <pre>Router> enable</pre> | Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted. |
| Step 2 <code>configure terminal</code> Example: <pre>Router# configure terminal</pre> | Enters global configuration mode. |

| Command or Action | Purpose |
|--|---|
| Step 3 <code>interface type number</code> Example: <pre>Router(config)# interface POS 3/0</pre> | Specifies the interface to configure and enters interface configuration mode. |
| Step 4 <code>no mpls ldp igp autoconfig</code> Example: <pre>Router(config-if)# no mpls ldp igp autoconfig</pre> | Disables LDP for that interface. |
| Step 5 <code>end</code> Example: <pre>Router(config-if)# end</pre> | Exits interface configuration mode and returns to privileged EXEC mode. |

Verifying MPLS LDP Autoconfiguration with OSPF

The following steps explain how to verify the MPLS LDP Autoconfiguration feature.

SUMMARY STEPS

1. `enable`
2. `show mpls interfaces [type number / vrf vpn-name][all] [detail] [internal]`
3. `show mpls ldp discovery [vrf vpn-name / all] [detail]`

DETAILED STEPS

Step 1 `enable`

Enables privileged EXEC mode. Enter your password if prompted.

Step 2 `show mpls interfaces [type number / vrf vpn-name][all] [detail] [internal]`

The `show mpls interfaces` command displays the method used to enable LDP on an interface:

- If LDP is enabled by the `mpls ldp autoconfig` command, the output displays:

Example:

```
IP labeling enabled (ldp):
IGP config
```

- If LDP is enabled by the `mpls ip` command, the output displays:

Example:

```
IP labeling enabled (ldp):
  Interface config
```

- If LDP is enabled by the **mpls ip** command and the **mpls ldp autoconfig** command, the output displays:

Example:

```
IP labeling enabled (ldp):
  Interface config
  IGP config
```

The following example shows that LDP was enabled on the interface by both the **mpls ip** and **mpls ldp autoconfig** commands:

Example:

```
Router# show mpls interfaces Serial 2/0 detail

Interface Serial2/0:
  IP labeling enabled (ldp):
    Interface config
    IGP config
  LSP Tunnel labeling enabled
  BGP labeling not enabled
  MPLS operational
  Fast Switching Vectors:
    IP to MPLS Fast Switching Vector
    MPLS Turbo Vector
  MTU = 1500
```

Step 3 **show mpls ldp discovery [vrf *vpn-name* / all] [detail]**

The **show mpls ldp discovery detail** command also shows how LDP was enabled on the interface. In the following example, LDP was enabled by both the **mpls ip** and **mpls ldp autoconfig** commands:

Example:

```
Router# show mpls ldp discovery detail
Local LDP Identifier:
  10.11.11.11:0
Discovery Sources:
Interfaces:
  Serial2/0 (ldp): xmit/recv
    Enabled: Interface config, IGP config;
    Hello interval: 5000 ms; Transport IP addr: 10.11.11.11
    LDP Id: 10.10.10.10:0
    Src IP addr: 10.0.0.1; Transport IP addr: 10.10.10.10
    Hold time: 15 sec; Proposed local/peer: 15/15 sec
```

Configuring MPLS LDP Autoconfiguration with IS-IS Interfaces

The following steps explain how to configure the MPLS LDP Autoconfiguration feature for interfaces that are running IS-IS processes.

SUMMARY STEPS

1. enable
2. configure terminal
3. interface type number
4. ip address *prefix mask*
5. ip router isis
6. exit
7. mpls ip
8. mpls label protocol ldp
9. router isis
10. mpls ldp autoconfig [level-1 | level-2]
11. end

DETAILED STEPS

| | Command or Action | Purpose |
|---------------|--|---|
| Step 1 | <p>enable</p> <p>Example:</p> <pre>Router> enable</pre> | <p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> • Enter your password if prompted. |
| Step 2 | <p>configure terminal</p> <p>Example:</p> <pre>Router# configure terminal</pre> | <p>Enters global configuration mode.</p> |
| Step 3 | <p>interface type number</p> <p>Example:</p> <pre>Router(config)# interface POS 0/2</pre> | <p>Specifies the interface to configure and enters interface configuration mode.</p> |
| Step 4 | <p>ip address <i>prefix mask</i></p> <p>Example:</p> <pre>Router(config-if)# ip address 10.50.72.4 255.0.0.0</pre> | <p>Assigns an IP address to the interface.</p> |

| | Command or Action | Purpose |
|---------|---|--|
| Step 5 | ip router isis Example: Router(config-if)# ip router isis | Enables IS-IS for IP on the interface. |
| Step 6 | exit Example: Router(config-if)# exit | Exits interface configuration mode. |
| Step 7 | mpls ip Example: Router(config)# mpls ip | Globally enables hop-by-hop forwarding. |
| Step 8 | mpls label protocol ldp Example: Router(config)# mpls label protocol ldp | Specifies LDP as the default label distribution protocol. |
| Step 9 | router isis Example: Router(config)# router isis | Enables an IS-IS process on the router and enters router configuration mode. |
| Step 10 | mpls ldp autoconfig [level-1 level-2] Example: Router(config-router)# mpls ldp autoconfig | Enables the LDP for interfaces that belong to an IS-IS process. |
| Step 11 | end Example: Router(config-router)# end | Exits router configuration mode and returns to privileged EXEC mode. |

Disabling MPLS LDP Autoconfiguration from Selected IS-IS Interfaces

When you issue the **mpls ldp autoconfig** command, all the interfaces that belong to an IS-IS process are enabled for LDP. To remove LDP from some interfaces, use the **no mpls ldp igp autoconfig** command on

those interfaces. The following configuration steps show how to disable LDP from some of the interfaces after they were configured with the MPLS LDP Autoconfiguration feature with the **mpls ldp autoconfig** command.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface *type number***
4. **no mpls ldp igp autoconfig**
5. **end**

DETAILED STEPS

| Command or Action | Purpose |
|--|---|
| <p>Step 1 enable</p> <p>Example:</p> <pre>Router> enable</pre> | <p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> • Enter your password if prompted. |
| <p>Step 2 configure terminal</p> <p>Example:</p> <pre>Router# configure terminal</pre> | <p>Enters global configuration mode.</p> |
| <p>Step 3 interface <i>type number</i></p> <p>Example:</p> <pre>Router(config)# interface POS 3/0</pre> | <p>Specifies the interface to configure and enters interface configuration mode.</p> |
| <p>Step 4 no mpls ldp igp autoconfig</p> <p>Example:</p> <pre>Router(config-if)# no mpls ldp igp autoconfig</pre> | <p>Disables LDP for that interface.</p> |
| <p>Step 5 end</p> <p>Example:</p> <pre>Router(config-if)# end</pre> | <p>Exits interface configuration mode and returns to privileged EXEC mode.</p> |

Configuration Examples for MPLS LDP Autoconfiguration

The following sections show examples for the MPLS LDP Autoconfiguration feature with OSPF and IS-IS processes.

- [MPLS LDP Autoconfiguration with IS-IS Examples, page 11](#)
- [MPLS LDP Autoconfiguration with OSPF Example, page 11](#)

MPLS LDP Autoconfiguration with IS-IS Examples

The following example shows the configuration of the MPLS LDP Autoconfiguration feature on POS0/2 and 0/3 interfaces, which are running IS-IS processes:

```
configure terminal
interface POS 0/2
 ip address 10.0.0.1 255.0.0.1
 ip router isis
!
interface POS 0/3
 ip address 10.1.1.1 255.0.1.0
 ip router isis
exit

mpls ip

mpls label protocol ldp

router isis
mpls ldp autoconfig
```

MPLS LDP Autoconfiguration with OSPF Example

The following configuration commands enable LDP for OSPF process 1 area 3. The **mpls ldp autoconfig area 3** command and the OSPF **network** commands enable LDP on POS interfaces 0/0, 0/1, and 1/1. The **no mpls ldp igp autoconfig** command on POS interface 1/0 prevents LDP from being enabled on POS interface 1/0, even though OSPF is enabled for that interface.

```
configure terminal
interface POS 0/0
 ip address 10.0.0.1 255.0.0.0
!
interface POS 0/1
 ip address 10.0.1.1 255.0.0.1
!
interface POS 1/1
 ip address 10.1.1.1 255.255.0.0
!
interface POS 1/0
 ip address 10.1.0.1 0.1.0.255
 exit
!
router ospf 1
 network 10.0.0.0 0.0.255.255 area 3
 network 10.1.0.0 0.0.255.255 area 3
 mpls ldp autoconfig area 3
 end
interface POS 1/0
 no mpls ldp igp autoconfig
```

Additional References

The following sections provide references related to the MPLS LDP Autoconfiguration feature.

Related Documents

| Related Topic | Document Title |
|--|--|
| MPLS commands | <i>Cisco IOS Multiprotocol Label Switching Command Reference</i> |
| MPLS LDP | MPLS Label Distribution Protocol |
| The MPLS LDP-IGP Synchronization feature | MPLS LDP-IGP Synchronization |
| The MPLS LDP Session Protection feature | MPLS LDP Session Protection |
| Configuring integrated IS-IS | Integrated IS-IS Routing Protocol Overview |

Standards

| Standard | Title |
|--|-------|
| No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature | -- |

MIBs

| MIB | MIBs Link |
|--------------|--|
| MPLS LDP MIB | To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs |

RFCs

| RFC | Title |
|----------|-----------------------------------|
| RFC 3036 | LDP Specification |
| RFC 3037 | LDP Applicability |

Technical Assistance

| Description | Link |
|--|---|
| <p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> | http://www.cisco.com/techsupport |
| <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> | |
| <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p> | |

Feature Information for MPLS LDP-VRF-Aware Static Labels

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

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Table 1 **Feature Information for MPLS LDP-VRF-Aware Static Labels**

| Feature Name | Releases | Feature Information |
|----------------------------------|--------------------------|---|
| MPLS LDP-VRF-Aware Static Labels | Cisco IOS XE Release 2.1 | <p>The MPLS LDP-VRF-Aware Static Labels feature explains how to configure the MPLS LDP-VRF-Aware Static Labels feature and MPLS static labels. VRF-aware static labels can be used at the edge of an MPLS VPN, whereas MPLS static labels can be used only in the MPLS VPN provider core.</p> <p>In Cisco IOS XE Release 2.2, this feature was implemented on the Cisco ASR 1000 Series Aggregation Services Routers.</p> <p>The following commands were introduced or modified: debug mpls static binding, mpls label range, mpls static binding ipv4, mpls static binding ipv4 vrf, show mpls label range, show mpls static binding ipv4, and show mpls static binding ipv4 vrf.</p> |

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