



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.

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 for MPLS LDP Autoconfiguration”](#) section on page 13.

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Restrictions for MPLS LDP Autoconfiguration

The MPLS LDP Autoconfiguration feature has the following restrictions:

- 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.
- 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

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 following section provides information about autoconfiguration feature on OSPF and IS-IS interfaces:

- [MPLS LDP Autoconfiguration on OSPF and IS-IS Interfaces](#)

MPLS LDP Autoconfiguration on OSPF and IS-IS Interfaces

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. 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

This section contains the following procedures:

- [Configuring MPLS LDP Autoconfiguration with OSPF Interfaces, page 3](#) (required)
- [Disabling MPLS LDP Autoconfiguration from Selected OSPF Interfaces, page 4](#) (optional)
- [Verifying MPLS LDP Autoconfiguration with OSPF, page 5](#) (optional)
- [Configuring MPLS LDP Autoconfiguration with IS-IS Interfaces, page 6](#) (required)
- [Disabling MPLS LDP Autoconfiguration from Selected IS-IS Interfaces, page 8](#) (optional)

- [Verifying MPLS LDP Autoconfiguration with IS-IS, page 9](#) (optional)

Configuring MPLS LDP Autoconfiguration with OSPF Interfaces

The following steps explain how to configure LDP for interfaces running OSPF processes.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **mpls ip**
4. **mpls label protocol ldp**
5. **interface** *type number*
6. **ip address** *prefix mask*
7. **exit**
8. **router ospf** *process-id*
9. **network** *ip-address wildcard-mask area area-id*
10. **mpls ldp autoconfig** [**area** *area-id*]
11. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none">• Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	mpls ip Example: Router(config)# mpls ip	Globally enables hop-by-hop forwarding.
Step 4	mpls label protocol ldp Example: Router(config)# mpls label protocol ldp	Specifies LDP as the default label distribution protocol.
Step 5	interface <i>type number</i> Example: Router(config)# interface POS 3/0	Specifies the interface to configure and enters interface configuration mode.

	Command or Action	Purpose
Step 6	<code>ip address prefix mask</code> Example: Router(config-if)# ip address 10.0.0.11 255.255.255.255	Assigns an IP address to the interface.
Step 7	<code>exit</code> Example: Router(config-if)# exit	Exits interface configuration mode.
Step 8	<code>router ospf process-id</code> Example: Router(config)# router ospf 1	Enables OSPF routing and enters router configuration mode.
Step 9	<code>network ip-address wildcard-mask area area-id</code> Example: Router(config-router)# network 10.0.0.0 0.0.255.255 area 3	Specifies the interface on which OSPF runs and defines the area ID for that interface.
Step 10	<code>mpls ldp autoconfig [area area-id]</code> Example: Router(config-router)# mpls ldp autoconfig area 3	Enables the MPLS LDP Autoconfiguration feature to enable LDP on interfaces belonging to an OSPF process. <ul style="list-style-type: none"> If no area is specified, the command applies to all interfaces associated with the OSPF process. If an area ID is specified, then only interfaces associated with that OSPF area are enabled with LDP.
Step 11	<code>end</code> Example: Router(config-router)# end	Exits router 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	enable Example: Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none">• Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	interface <i>type number</i> Example: Router(config)# interface POS 3/0	Specifies the interface to configure and enters interface configuration mode.
Step 4	no mpls ldp igp autoconfig Example: Router(config-if)# no mpls ldp igp autoconfig	Disables LDP for that interface.
Step 5	end Example: Router(config-if)# end	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:


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

- If LDP is enabled by the **mpls ip** command, the output displays:
IP labeling enabled (ldp):
Interface config
- If LDP is enabled by the **mpls ip** command and the **mpls ldp autoconfig** command, the output displays:

```
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:

```
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:

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

	Command or Action	Purpose
Step 9	<code>router isis</code> Example: Router(config)# router isis	Enables an IS-IS process on the router and enters router configuration mode.
Step 10	<code>mpls ldp autoconfig [level-1 level-2]</code> Example: Router(config-router)# mpls ldp autoconfig	Enables the LDP for interfaces that belong to an IS-IS process.
Step 11	<code>end</code> 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
Step 1	<code>enable</code> Example: Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	<code>configure terminal</code> Example: Router# configure terminal	Enters global configuration mode.
Step 3	<code>interface type number</code> Example: Router(config)# interface POS 3/0	Specifies the interface to configure and enters interface configuration mode.

	Command or Action	Purpose
Step 4	<code>no mpls ldp igp autoconfig</code> Example: Router(config-if)# no mpls ldp igp autoconfig	Disables LDP for that interface.
Step 5	<code>end</code> Example: Router(config-if)# end	Exits interface configuration mode and returns to privileged EXEC mode.

Verifying MPLS LDP Autoconfiguration with IS-IS

You can verify that the MPLS LDP Autoconfiguration feature is working correctly with the **show isis mpls ldp** command.

SUMMARY STEPS

1. **enable**
2. **show isis mpls ldp**

DETAILED STEPS

Step 1 **enable**

Enables privileged EXEC mode.

Step 2 **show isis mpls ldp**

The output of the following **show isis mpls ldp** command shows that IS-IS is configured on the interface and that LDP is enabled:

```
Router# show isis mpls ldp

Interface: POS0/2; ISIS tag null enabled
ISIS is UP on interface
AUTOCONFIG Information :
  LDP enabled: YES
  SYNC Information :
    Required: NO
```

The output shows :

- IS-IS is up.
- LDP is enabled.

If the MPLS LDP Autoconfiguration feature is not enabled on an interface, the output looks like the following:

```
Interface: Ethernet0; ISIS tag null enabled
ISIS is UP on interface
AUTOCONFIG Information :
  LDP enabled: NO
  SYNC Information :
    Required: NO
```

Troubleshooting Tips

You can use the **debug mpls ldp autoconfig** command to display events that are related to the MPLS LDP Autoconfiguration feature.

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 OSPF: Example, page 10](#)
- [MPLS LDP Autoconfiguration with IS-IS: Examples, page 10](#)

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
```

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
```

Additional References

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

Related Documents

Related Topic	Document Title
MPLS commands	Cisco IOS Multiprotocol Label Switching Command Reference
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> <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>	http://www.cisco.com/techsupport

Feature Information for MPLS LDP Autoconfiguration

Table 1 lists the release history for this feature.

Not all commands may be available in your Cisco IOS software release. For release information about a specific command, see the command reference documentation.

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Note

Table 1 lists only the Cisco IOS software release that introduced support for a given feature in a given Cisco IOS software release train. Unless noted otherwise, subsequent releases of that Cisco IOS software release train also support that feature.

Table 1 Feature Information for MPLS LDP Autoconfiguration

Feature Name	Releases	Feature Information
MPLS LDP Autoconfiguration	12.0(30)S 12.0(32)SY 12.2(28)SB 12.2(33)SRB 12.3(14)T 15.0(1)M 12.2(33)XNE	<p>This feature enables you to globally configure LDP on every interface associated with a specified Interior Gateway Protocol (IGP) instance.</p> <p>The following sections provide information about this feature:</p> <ul style="list-style-type: none"> • Information About MPLS LDP Autoconfiguration, page 2 • How to Configure MPLS LDP Autoconfiguration, page 2 <p>In Cisco IOS Release 12.0(30)S, this feature was introduced with support for OSPF.</p> <p>In Cisco IOS Release 12.0(32)SY, support for IS-IS was added.</p> <p>This feature was integrated into Cisco IOS Release 12.2(28)SB with support for OSPF.</p> <p>This feature was integrated into Cisco IOS Release 12.2(33)SRB.</p> <p>This feature was integrated into Cisco IOS Release 12.3(14)T with support for OSPF.</p> <p>In Release 15.0(1)M, support for IS-IS was added.</p> <p>This feature was integrated into Cisco IOS Release 12.2(33)XNE with support for IS-IS on the Cisco 10000 series router.</p> <p>The following commands were modified: mpls ldp autoconfig, mpls ldp igp autoconfig, show isis mpls ldp, and show mpls ldp discovery.</p>

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