



Configuring Integrated IS-IS Protocol Shutdown Support Maintaining Configuration Parameters

The Integrated IS-IS Protocol Shutdown Support Maintaining Configuration Parameters feature allows you to disable the Integrated Intermediate System-to-Intermediate System (IS-IS) protocol at the interface level or at the global IS-IS process level without removing the IS-IS configuration parameters.

This module describes the tasks to configure and monitor a basic Intermediate System-to-Intermediate System (IS-IS) network. The IS-IS process and adjacency formation are also explained. IS-IS is link-state protocol that allows the network designer to organize the network into a group of flooding domains. Often deployed as the Interior Gateway Protocol (IGP) for an ISP network backbone, IS-IS is capable of handling large topologies and large numbers of routing changes.

- [Prerequisites for Integrated IS-IS Protocol Shutdown Support Maintaining Configuration Parameters](#), on page 1
- [Information About Integrated IS-IS Protocol Shutdown Support Maintaining Configuration Parameters](#), on page 2
- [How to Create, Monitor and Make Changes to Integrated IS-IS Protocol Shutdown Support Maintaining Configuration Parameters](#), on page 3
- [Configuration Examples for Integrated IS-IS Protocol Shutdown Support Maintaining Configuration Parameters](#), on page 11
- [“Where to Go Next](#), on page 14
- [Additional References for Integrated IS-IS Protocol Shutdown Support Maintaining Configuration Parameters](#), on page 15
- [Feature Information for Integrated IS-IS Protocol Shutdown Support Maintaining Configuration Parameters](#), on page 16

Prerequisites for Integrated IS-IS Protocol Shutdown Support Maintaining Configuration Parameters

- Before performing the tasks in this module, you should be familiar with the concepts described in the “Integrated IS-IS Routing Protocol Overview” module.
- You should know your network design and how you want traffic to flow through it before configuring IS-IS. Define areas, prepare an addressing plan for the devices (including defining the NETs), and determine the interfaces that will run Integrated IS-IS. To facilitate verification, a matrix of adjacencies should be prepared before you configure your devices, showing what neighbors should be expected in

the adjacencies table. For more information about verifying IS-IS configuration and formed adjacencies, see “Monitoring IS-IS”.

Information About Integrated IS-IS Protocol Shutdown Support Maintaining Configuration Parameters

IS-IS Process and Adjacencies

IS-IS requires some configuration on both the device and the interface. An IS-IS process is created when you enable IS-IS on a device and define a specific tag to identify that routing process. Interfaces configured with a specific tag will be part of the corresponding device process. More than one IS-IS process can run on a device for Connectionless Network Service (CLNS), but only one IS-IS process can run for IP.

Small IS-IS networks are built as a single area that includes all the devices in the network. As the network grows larger, it is usually reorganized into a backbone area made up of the connected set of all Level 2 devices from all areas. The areas are connected to local areas. Within a local area, devices know how to reach all system IDs. Between areas, devices know how to reach the backbone, and the backbone devices know how to reach other areas.

Devices establish Level 1 adjacencies to perform routing within a local area (intra-area routing). Devices establish Level 2 adjacencies to perform routing between Level 1 areas (inter-area routing).

If the network administrator does not specify Level 1 or Level 2 routing for the routing process being configured, the default routing behavior for the routing process will be Level 1-2.

If Level 2 routing is configured on any process, additional processes are automatically configured as Level 1, with the exception of previously configured Level 2 process, which will remain Level 2. You can have only one Level-2 process. You can configure the Level-2 process to perform Level-1 routing at the same time. If Level-2 routing is not desired for a device instance, use the **is-type** command in device configuration mode to remove the Level-2 capability. You can also use the **is-type** command to configure a different device instance as a Level-2 device.

Some networks use legacy equipment that supports only Level 1 routing. These devices are typically organized into many small areas that cannot be aggregated due to performance limitations. Cisco devices are used to interconnect each area to the Level 2 backbone.

Network entity titles (NETs) define the area addresses and the system ID of the device. See the “Configuring ISO CLNS” module in the *Cisco IOS ISO CLNS Configuration Guide* for a more detailed discussion of NETs.

PDU Packet Types in IS-IS Routing

The OSI stack defines a unit of data as a protocol data unit (PDU). A frame therefore is regarded by OSI as a data-link PDU, and a packet is regarded as a network PDU. There are four types of PDU packets, and each type can be Level 1 or Level 2:

- LSP—Link-state PDU. Used to distribute link-state information.
- IIH PDU—For IS-IS this is called the IS-IS Hello PDU. Used to establish and maintain adjacencies.



Note On point-to-point links, IIH PDUs will be the same for Level 1 and Level 2. Both Level-1 and Level-2 IIH use the same type of PDU, but they carry different circuit types.

- PSNP—Partial sequence numbers protocol data unit (PDU). Used to acknowledge and request link-state information.
- CSNP—Complete sequence number protocol data unit (PDU). Used to distribute the complete link-state database of a device.

IS-IS LSPs include specific information about the device’s attachments. The following information is included in multiple Type Length Value (TLV) fields in the main body of the LSP:

- The links to neighbor device intermediate systems (ISs), including the metrics of those interfaces
- The links to the neighbor end systems (ESs)

How to Create, Monitor and Make Changes to Integrated IS-IS Protocol Shutdown Support Maintaining Configuration Parameters

Enabling IS-IS as an IP Routing Protocol on the Device

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **router isis** [*area-tag*]
4. **net** *network-entity-title*
5. **end**

DETAILED STEPS

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

	Command or Action	Purpose
Step 3	router isis <i>[area-tag]</i> Example: <pre>Device(config)# router isis</pre>	Assigns a tag to an IS-IS process. Enters router configuration mode. <ul style="list-style-type: none"> Configure tags to identify multiple IS-IS processes by giving a meaningful name for each routing process. If the tag is not specified, a null tag (0) is assumed and the process is referenced with a null tag. The tag name must be unique among all IP router processes for the device.
Step 4	net <i>network-entity-title</i> Example: <pre>Device(config-router)# net 49.0001.0000.0000.000b.00</pre>	Configures the NET on the device. <ul style="list-style-type: none"> The NET identifies the device for IS-IS.
Step 5	end Example: <pre>Device(config-router)# end</pre>	Exits router configuration mode and returns to privileged EXEC mode.

Enabling IS-IS as an IP Routing Protocol on the Interface

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **ip address** *ip-address mask [secondary]*
5. **ip router isis** *[area-tag]*
6. **end**

DETAILED STEPS

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

	Command or Action	Purpose
Step 3	interface <i>type number</i> Example:	Enters interface configuration mode.
Step 4	ip address <i>ip-address mask [secondary]</i> Example: Device(config-if)# ip address 172.16.1.27 255.255.255.0	Sets the primary IP address on the interface.
Step 5	ip router isis [<i>area-tag</i>] Example: Device(config-if)# ip router isis company1	Enables IS-IS on the interfaces that are to use IS-IS to distribute their IP information (and additionally that might be used to establish IS-IS adjacencies). <ul style="list-style-type: none"> • Use the <i>area-tag</i> argument to specify to which IS-IS process the device belongs. • If there is more than one IS-IS process on the device, repeat the ip router isis command for each interface, specifying an area tag for each interface to associate each interface with the specific process to which it belongs.
Step 6	end Example: Device(config-if)# end	Exits interface configuration mode and returns to privileged EXEC mode.

Monitoring IS-IS

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **isis display delimiter** [*return count* | **character** *count*]
4. **exit**
5. **show ip protocols**
6. **show clns** *area-tag is-neighbors* [*type number*] [**detail**]
7. **show clns interface** [*type number*]
8. **show clns** *area-tag neighbors* [*type number*] [**area**] [**detail**]
9. **show clns** *area-tag traffic*
10. **show ip route** [*ip-address [mask]*] [[**longer-prefixes**] | *protocol [process-id]*] | **list** [*access-list-number* | *access-list-name*] | **static download**]
11. **show isis** [*process-tag*] **database** [**level-1**] [**level-2**] [**l1**] [**l2**] [**detail**] [**lspid**]
12. **show isis database verbose**
13. **show isis lsp-log**
14. **show isis** [*area-tag*] [**ipv6** | *****] **spf-log**

15. `show isis [process-tag] [ipv6 | *] topology`
16. `show isis [area-tag] neighbors [detail]`

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	isis display delimiter [return count character count] Example: Device(config)# isis display delimiter return 3	Makes output from multiarea displays easier to read by specifying the delimiter to use to separate displays of information.
Step 4	exit Example: Device(config)# exit	Returns to privileged EXEC mode.
Step 5	show ip protocols Example: Device# show ip protocols	Displays the parameters and current state of the active routing protocol process. <ul style="list-style-type: none"> • You can use this command to learn what protocols are active, what interfaces they are active on, what networks they are routing for, and other parameters that relate to the routing protocols.
Step 6	show clns area-tag is-neighbors [type number] [detail] Example: Device# show clns is-neighbors detail	Displays IS-IS information for IS-IS device adjacencies.
Step 7	show clns interface [type number] Example: Device# show clns interface	List the CLNS-specific information about each interface.
Step 8	show clns area-tag neighbors [type number] [area] [detail] Example: Device# show clns area3 neighbors	Displays both ES and IS neighbors. <ul style="list-style-type: none"> • The show clns neighbor command output verifies that the right adjacencies have established. A matrix of adjacencies should be prepared before you configure your devices, showing what neighbors

	Command or Action	Purpose
		should be expected in the adjacencies table, to facilitate verification.
Step 9	<p>show clns <i>area-tag</i> traffic</p> <p>Example:</p> <pre>Device# show clns area3 traffic</pre>	<p>Displays traffic statistics.</p> <p>To monitor IS-IS for stability once it has been deployed across your network, enter the show clns traffic command to check the following important statistics: high numbers of SPFs, checksum errors, and retransmissions. To troubleshoot IS-IS behavior, you can use the output from the show clns traffic command to check for the following indicators:</p> <ul style="list-style-type: none"> • The number of link-state PDUs (LSPs) can help you determine the stability of the IS-IS network. The number of LSPs should never be zero. However, an LSP count that keeps increasing over a short time period indicates a network issue. • LSP retransmissions should stay low. A later execution of the show clns traffic command that shows an increase in LSP retransmissions, as compared to an earlier execution of the command, can indicate instability or traffic problems. • To check for partial route calculations (PRCs), enter the show clns traffic command. PRCs are flooded when a change that does not affect topology is reported through an LSP; typical examples include the addition or removal of a prefix or metric changes for external or passive interfaces. A PRC update queue that remains full or increases to the maximum value for long periods of time indicates network instability. • LSP checksum errors indicate a problem. • The update queue should not stay full and should not drop much.
Step 10	<p>show ip route [<i>ip-address</i> [<i>mask</i>]] [[longer-prefixes] <i>protocol</i> [<i>process-id</i>] list [<i>access-list-number</i> <i>access-list-name</i>] static download]]</p> <p>Example:</p> <pre>Device# show ip route 172.16.0.21</pre>	Displays the current state of the routing table.
Step 11	<p>show isis [<i>process-tag</i>] database [level-1] [level-2] [l1] [l2] [detail] [lspid]</p> <p>Example:</p>	<p>Displays additional information about the IS-IS database.</p> <ul style="list-style-type: none"> • Displays the link-state database for Level-1 and Level-2, the contents for each LSP, and the link-state protocol PDU identifier.

	Command or Action	Purpose
	Device# show isis database detail	
Step 12	show isis database verbose Example: Device# show isis database verbose	Displays additional information about the IS-IS database such as the sequence number, checksum, and holdtime for LSPs.
Step 13	show isis lsp-log Example: Device# show isis lsp-log	Displays a log of LSPs including time of occurrence, count, interface, and the event that triggered the LSP.
Step 14	show isis [area-tag] [ipv6 *] spf-log Example: Device# show isis spf-log	Displays how often and why the device has run a full shortest path first (SPF) calculation. <ul style="list-style-type: none"> • If the device continues to run SPF without ceasing, there might be an issue regarding a change in the network (intra-area). The cause for the continued SPF calculations could be an interconnecting link that is transitioning up/down/up/down or a metric change. It is normal for the SPF calculation to run a few times when a network change occurs, but then it should cease.
Step 15	show isis [process-tag] [ipv6 *] topology Example: Device# show isis topology	Displays a list of all connected devices in all areas.
Step 16	show isis [area-tag] neighbors [detail] Example: Device# show isis neighbors detail	Displays IS-IS adjacency information. <ul style="list-style-type: none"> • The show isis neighbor detail command output verifies that the right adjacencies have established. A matrix of adjacencies should be prepared before you configure your devices, showing what neighbors should be expected in the adjacencies table, to facilitate verification.

Example

When the **show isis neighbors** command is entered with the **detail** keyword, the output provides information about the IS-IS adjacencies that have formed.

```
Device1# show isis neighbors detail
```

```
System Id      Type Interface IP Address      State Holdtime Circuit Id
Device2        L2  Et1/0      10.1.1.0        UP    255       Circuit3.01
Area Address(es): 32
SNPA: aabb.cc00.2001
```



```

State Changed: 00:00:14
LAN Priority: 64
Format: Phase V

```

Troubleshooting Tips

You can use the following two system debugging commands to check your IS-IS IPv4 implementation.

- If adjacencies are not coming up properly, use the **debug isis adj-packets** command.
- To display a log of significant events during an IS-IS SPF calculation, use the **debug isis spf-events** command.

Shutting Down IS-IS to Make Changes to Your IS-IS Network

You can shut down IS-IS (placing it in an administrative down state) to make changes to the IS-IS protocol configuration, without losing your configuration parameters. You can shut down IS-IS at the interface level or at the global IS-IS process level. If the device was rebooted when the protocol was turned off, the protocol would be expected to come back up in the disabled state. When the protocol is set to the administrative down state, network administrators are allowed to administratively turn off the operation of the IS-IS protocol without losing the protocol configuration, to make a series of changes to the protocol configuration without having the operation of the protocol transition through intermediate—and perhaps undesirable—states, and to then reenabling the protocol at a suitable time.

Before the introduction of the Integrated IS-IS Protocol Shutdown Support Maintaining Configuration Parameters feature, there was no nondestructive way to disable IS-IS operation. The only way to disable IS-IS at the device level was to issue the **no router isis** command, which removes the IS-IS configuration. At the interface level there are two ways to disable IS-IS operation. You can enter the **no ip router isis** command to remove IS-IS from the specified interface, or you can put the interface into passive mode such that the IP address of the specified interface will still be advertised. In either case, the current IS-IS configuration will be removed.

Shutting Down IS-IS in Interface Mode

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **isis protocol shutdown**
5. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.

	Command or Action	Purpose
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	interface type number Example:	Configures an interface and enters interface configuration mode.
Step 4	isis protocol shutdown Example: Device(config-if)# isis protocol shutdown	Disables the IS-IS protocol so that it cannot form adjacencies on a specified interface and places the IP address of the interface into the LSP that is generated by the device.
Step 5	end Example: Device(config-if)# end	Exits interface configuration mode and returns to privileged EXEC mode.

Shutting Down IS-IS in Router Mode

SUMMARY STEPS

1. enable
2. configure terminal
3. router isis *area-tag*
4. protocol shutdown
5. end

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	router isis area-tag Example: Device(config)# router isis 1	Enables the IS-IS routing protocol and specifies an IS-IS process. <ul style="list-style-type: none"> • Enters router configuration mode.

	Command or Action	Purpose
Step 4	protocol shutdown Example: Device(config-router)# protocol shutdown	Prevents IS-IS from forming any adjacency on any interface and clears the IS-IS LSP database, without actually removing the IS-IS configuration.
Step 5	end Example: Device(config-router)# end	Exits router configuration mode and returns to privileged EXEC mode.

Configuration Examples for Integrated IS-IS Protocol Shutdown Support Maintaining Configuration Parameters

Example: Configuring a Basic IS-IS Network

The following example shows how to configure three devices to run IS-IS as an IP routing protocol.

Device A Configuration

```
router isis
 net 49.0001.0000.0000.000a.00
 interface ethernet0/0
 ip address 10.1.1.1 255.255.255.0
 ip router isis
 interface serial 2/0
 ip router isis
 ip address 192.168.1.2 255.255.255.0
```

Device B Configuration

```
router isis
 net 49.0001.0000.0000.000b.00
 interface ethernet0/0
 ip router isis
 ip address 172.17.1.1 255.255.255.0
 interface serial2/0
 ip router isis
 ip address 192.168.1.1 255.255.255.0
 interface serial5/0
 ip router isis
 ip address 172.21.1.1 255.255.255.0
```

Device C Configuration

```
router isis
 net 49.0001.0000.0000.000c.00
 interface ethernet2/0
 ip router isis
```

Example: Configuring a Basic IS-IS Network

```

ip address 172.21.1.2 255.255.255.0
interface serial5/0
ip router isis
ip address 172.22.1.1 255.255.255.0

```

The **show isis topology** command displays the following information about how the devices are connected within the IS-IS network:

```
DeviceB# show isis topology
```

```

IS-IS paths to level-1 routers
System Id      Metric      Next-Hop      Interface      SNPA
DeviceA        10          DeviceA       Se2/0          *HDLC*
DeviceB        --
DeviceC        10          DeviceC       Se5/0          *HDLC*
IS-IS paths to level-2 routers
System Id      Metric      Next-Hop      Interface      SNPA
DeviceA        10          DeviceA       Se2/0          *HDLC*
DeviceB        --
DeviceC        10          DeviceC       Se5/0          *HDLC*

```

The **show isis database** command displays following information for the Level 1 and Level 2 LSPs for each device in the IS-IS network.

```
DeviceB# show isis database
```

```

IS-IS Level-1 Link State Database:
LSPID          LSP Seq Num  LSP Checksum  LSP Holdtime  ATT/P/OL
DeviceA.00-00  0x00000005  0x1A1D        1063          0/0/0
DeviceB.00-00  * 0x00000006  0xD15B        1118          0/0/0
DeviceC.00-00  0x00000004  0x3196        1133          1/0/0
IS-IS Level-2 Link State Database:
LSPID          LSP Seq Num  LSP Checksum  LSP Holdtime  ATT/P/OL
DeviceA.00-00  0x00000008  0x0BF4        1136          0/0/0
DeviceB.00-00  * 0x00000008  0x1701        1137          0/0/0
DeviceC.00-00  0x00000004  0x3624        1133          0/0/0

```

The **show ip route** command displays information about the interfaces of each device, including their IP addresses and how they are connected to Device B:

```
DeviceB# show ip route
```

```

Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set
 172.17.0.0/24 is subnetted, 1 subnets
C       172.17.1.0 is directly connected, Ethernet0/0
 172.16.0.0/24 is subnetted, 1 subnets
C       172.16.1.0 is directly connected, Serial4/0
 172.21.0.0/24 is subnetted, 1 subnets
C       172.21.1.0 is directly connected, Serial5/0
 172.22.0.0/24 is subnetted, 1 subnets
i L1    172.22.1.0 [115/20] via 172.21.1.2, Serial5/0
 10.0.0.0/24 is subnetted, 1 subnets
i L1    10.1.1.0 [115/20] via 192.168.1.2, Serial2/0
C       192.168.1.0/24 is directly connected, Serial2/0
C       192.168.3.0/24 is directly connected, Serial3/0

```

The **show isis spf-log** command displays logs of Level 1 and Level 2 LSPs including time of occurrence, duration, count, and the event that triggered the LSP.

```
DeviceC## show isis spf-log
```

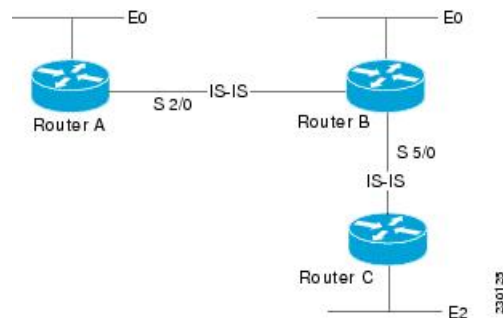
```

level 1 SPF log
When   Duration  Nodes  Count  First trigger LSP  Triggers
00:01:30  0         3      7      DeviceB.00-00     PERIODIC NEWADJ NEWLSP TLVT
level 2 SPF log
When   Duration  Nodes  Count  First trigger LSP  Triggers
00:01:31  0         3      7      DeviceB.00-00     PERIODIC NEWADJ NEWLSP TLVT

```

The figure below illustrates the sample configuration.

Figure 1: IS-IS Routing



Example: Shutting Down IS-IS in Interface Mode

The following device output shows that the device has two IS-IS adjacencies:

```
Device# show clns neighbors
```

System Id	Interface	SNPA	State	Holdtime	Type	Protocol
first	Et3/1	0002.7dd6.1c21	Up	25	L1L2	IS-IS
second	Et3/2	0004.6d25.c056	Up	29	L1L2	IS-IS

When the **isis protocol shutdown** command is entered for Ethernet interface 3/1, the IS-IS protocol will be disabled for the specified interface:

```
Device# configure terminal
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
Device(config)#
```

```
Device(config-if)# isis protocol shutdown
```

```
Device(config-if)# end
```

The following device output shows that the adjacency for Ethernet interface 3/1 has not formed:

```
Device# show clns neighbors
```

System Id	Interface	SNPA	State	Holdtime	Type	Protocol
second	Et3/2	0004.6d25.c056	Up	27	L1L2	IS-IS

Example: Shutting Down IS-IS in Router Mode

The following device output shows that the device has two IS-IS adjacencies:

```
Device# show clns neighbors

System Id  Interface  SNPA                State  Holdtime  Type    Protocol
south     Et3/1     0002.7dd6.1c21     Up     29        L1L2    IS-IS
north     Et3/2     0004.6d25.c056     Up     28        L1L2    IS-IS
```

The **protocol shutdown** command is entered so that IS-IS is disabled and no adjacencies will be formed on any interface:

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# router isis areal
Device(config-router)# protocol shutdown
Device(config-router)# end
```

The following device output now shows that both adjacencies are gone.

```
Device# show clns neighbors

System Id  Interface  SNPA                State  Holdtime  Type    Protocol
```

When the **no protocol shutdown** command is entered, the adjacencies will again be formed on both interfaces:

```
Device(config)# router isis areal
Device(config-router)# no protocol shutdown
Device(config-router)# end
Device# show clns neighbors

System Id  Interface  SNPA                State  Holdtime  Type    Protocol
south     Et3/1     0002.7dd6.1c21     Up     24        L1L2    IS-IS
north     Et3/2     0004.6d25.c056     Up     24        L1L2    IS-IS
```

“Where to Go Next

- To customize IS-IS for your network design, see the "Customizing IS-IS for Your Network Design" module.
- To customize IS-IS for achieving fast convergence and scalability, see the following modules:
 - “Overview of IS-IS Fast Convergence”
 - “Setting Best Practice Parameters for IS-IS Fast Convergence”
 - “Reducing Failure Detection Times in IS-IS Networks”
 - “Reducing Link Failure and Topology Change Notification Times in IS-IS Networks”
 - “Reducing Alternate-Path Calculation Times in IS-IS Networks”
- To enhance IS-IS network security, see the “Enhancing Security in an IS-IS Network” module.

Additional References for Integrated IS-IS Protocol Shutdown Support Maintaining Configuration Parameters

Related Documents

Related Topic	Document Title
IS-IS commands: complete command syntax, command mode, defaults, command history, usage guidelines, and examples	<i>Cisco IOS IP Routing: ISIS Command Reference</i>
Overview of IS-IS concepts	“Integrated IS-IS Routing Protocol Overview” module
Customizing IS-IS for achieving fast convergence and scalability	“Overview of IS-IS Fast Convergence” module

Standards

Standard	Title
No new or modified standards are supported, and support for existing standards has not been modified.	—

MIBs

MIB	MIBs Link
<ul style="list-style-type: none"> • CISCO-IETF-IP-FORWARD-MIB • CISCO-IETF-IP-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 1195	Use of OSI IS-IS for Routing in TCP/IP and Dual Environments <i>Use of OSI IS-IS for Routing in TCP/IP and Dual Environments</i> (http://www.ietf.org/rfc/rfc1195.txt)

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for Integrated IS-IS Protocol Shutdown Support Maintaining Configuration Parameters

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.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.