



CHAPTER 9

Configuring IS-IS

This chapter describes how to configure Integrated Intermediate System-to-Intermediate System (IS-IS).

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Information about IS-IS

IS-IS is an Interior Gateway Protocol (IGP) based on Standardization (ISO)/International Engineering Consortium (IEC) 10589. Cisco NX-OS supports Internet Protocol version 4 (IPv4). IS-IS is a dynamic link-state routing protocol that can detect changes in the network topology and calculate loop-free routes to other nodes in the network. Each router maintains a link-state database that describes the state of the network and sends packets on every configured link to discover neighbors. IS-IS floods the link-state information across the network to each neighbor. The router also sends advertisements and updates on the link-state database through all the existing neighbors.



Note

Cisco NX-OS does not support IPv6 for IS-IS.

This section includes the following topics:

- [IS-IS Overview, page 9-2](#)

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- [IS-IS Authentication, page 9-3](#)
- [Mesh Groups, page 9-4](#)
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- [Multiple IS-IS Instances, page 9-5](#)

IS-IS Overview

IS-IS sends a *hello packet* out every configured interface to discover IS-IS neighbor routers. The hello packet contains information, such as the authentication, area, and supported protocols, which the receiving interface uses to determine compatibility with the originating interface. The hello packets are also padded to ensure that IS-IS establishes adjacencies only with interfaces that have matching maximum transmission unit (MTU) settings. Compatible interfaces form adjacencies, which update routing information in the link-state database through link-state update messages (LSPs). By default, the router sends a periodic LSP refresh every 10 minutes and the LSPs remain in the link-state database for 20 minutes (the LSP lifetime). If the router does not receive an LSP refresh before the end of the LSP lifetime, the router deletes the LSP from the database.

The LSP interval must be less than the LSP lifetime or the LSPs time out before they are refreshed.

IS-IS sends periodic hello packets to adjacent routers. If you configure transient mode for hello packets, these hello packets do not include the excess padding used before IS-IS establishes adjacencies. If the MTU value on adjacent routers changes, IS-IS can detect this change and send padded hello packets for a period of time. IS-IS uses this feature to detect mismatched MTU values on adjacent routers. See the “[Configuring the Transient Mode for Hello Padding](#)” section on page 9-17.

IS-IS Areas

You can design IS-IS networks as a single area that includes all routers in the network or as multiple areas that connect into a backbone or Level 2 area. Routers in a nonbackbone area are Level 1 routers which establish adjacencies within a local area (intra-area routing). Level 2 area routers establish adjacencies to other Level 2 routers and perform routing between Level 1 areas (inter-area routing). A router can have both Level 1 and Level 2 areas configured. These Level 1/Level 2 routers act as area border routers which route information from the local area to the Level 2 backbone area (see [Figure 9-1](#)).

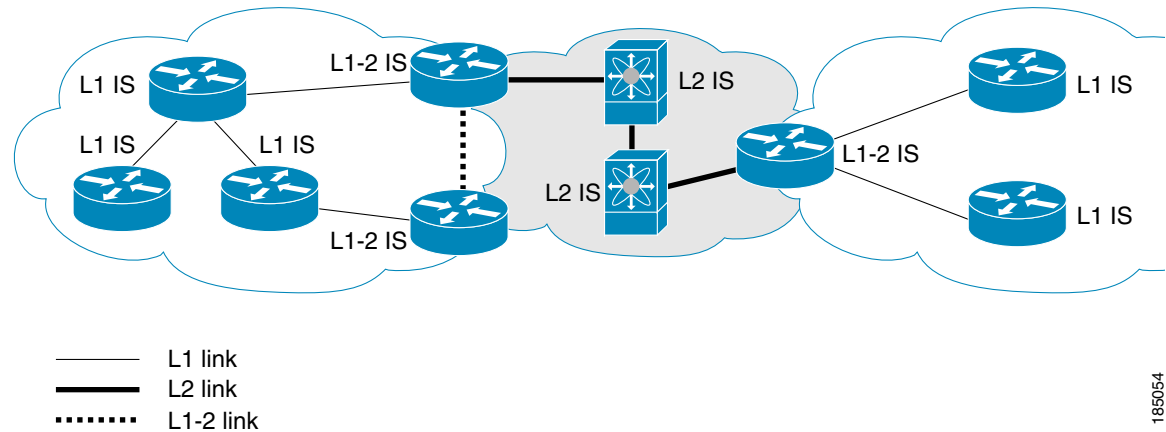
Within a Level 1 area, routers know how to reach all other routers in that area. The Level 2 routers know how to reach other area border routers and other Level 2 routers. Level 1/Level 2 routers straddle the boundary between two areas, routing traffic to and from the Level 2 backbone area. Level1/Level2 routers use the attached (ATT) bit signal Level 1 routers to set a default route to this Level1/Level2 router to connect to the Level 2 area.

In some instances, such as when you have two or more Level1/Level 2 routers in an area, you may want to control which Level1/Level2 router that the Level 1 routers use as the default route to the Level 2 area. You can configure which Level1/Level2 router sets the attached bit. See the “[Verifying IS-IS Configuration](#)” section on page 9-28.

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Each IS-IS instance in Cisco NX-OS supports either a single Level 1 or Level 2 area, or one of each. By default, all IS-IS instances automatically support Level 1 and Level 2 routing.

Figure 9-1 IS-IS Network Divided into Areas



An autonomous system boundary router (ASBR) advertises external destinations throughout the IS-IS autonomous system. External routes are the routes redistributed into IS-IS from any other protocol.

NET and System ID

Each IS-IS instance has an associated network entity title (NET). The NET is comprised of the IS-IS system ID, which uniquely identifies this IS-IS instance in the area and the area ID. For example, if the NET is 47.0004.004d.0001.0001.0c11.1111.00, then the system ID is 0000.0c11.1111.00 and the area is ID 47.0004.004d.0001.

Designated Intermediate System

IS-IS uses a designated intermediate system (DIS) in broadcast networks to prevent each router from forming unnecessary links with every other router on the broadcast network. IS-IS routers send LSPs to the DIS, which manages all the link-state information for the broadcast network. You can configure the IS-IS priority which IS-IS uses to select the DIS in an area.



Note

No DIS is required on a point-to-point network.

IS-IS Authentication

You can configure authentication to control adjacencies and the exchange of LSPs. Routers that want to become neighbors must exchange the same password for their configured level of authentication. IS-IS blocks a router that does not have the correct password. You can configure IS-IS authentication globally or for an individual interface for Level 1, Level 2, or both Level 1/Level 2 routing.

IS-IS supports the following authentication methods:

- Clear text—All packets exchanged carry a cleartext 128-bit password.
- MD5 digest—All packets exchanged carry a message digest that is based on a 128-bit key.

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To provide protection against passive attacks, IS-IS never sends the MD5 secret key as cleartext through the network. In addition, IS-IS includes a sequence number in each packet to protect against replay attacks.

You can use also keychains for hello and LSP authentication. See *Cisco Nexus 7000 Series NX-OS Security Configuration Guide, Release 4.x* for information on keychain management.

Mesh Groups

A *mesh group* is a set of interfaces in which all routers reachable over the interfaces have at least one link to every other router. Many links can fail without isolating one or more routers from the network.

In normal flooding, an interface receives a new LSP and floods the LSP out over all other interfaces on the router. With mesh groups, when an interface that is part of a mesh group receives a new LSP, the interface does not flood the new LSP over the other interfaces that are part of that mesh group.



Note

You may want to limit LSPs in certain mesh network topologies to improve network scalability. Limiting LSP floods may also reduce the reliability of the network (in case of failures). For this reason, we recommend that you use mesh groups only if specifically required, and then only after careful network design.

You can also configure mesh groups in block mode for parallel links between routers. In this mode, all LSPs are blocked on that interface in a mesh group after the routers initially exchange their link-state information.

Overload Bit

IS-IS uses the overload bit to tell other routers not to use the local router to forward traffic but to continue routing traffic destined for that local router.

You may want to use the overload bit in these situations:

- The router is in a critical condition.
- Graceful introduction and removal of the router to/from the network.
- Other (administrative or traffic engineering) reasons. For example, to wait for BGP convergence.

Route Summarization

You can configure a summary aggregate address. Route summarization simplifies route tables by replacing a number of more-specific addresses with an address that represents all the specific addresses. For example, you can replace 10.1.1.0/24, 10.1.2.0/24, and 10.1.3.0/24 with one summary address, 10.1.0.0/16.

If more specific routes are in the routing table, IS-IS advertises the summary address with a metric equal to the minimum metric of the more specific routes.



Note

Cisco NX-OS does not support automatic route summarization.

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Route Redistribution

You can use IS-IS to redistribute static routes, routes learned by other IS-IS autonomous systems, or routes from other protocols. You must configure a route map with the redistribution to control which routes are passed into IS-IS. A route map allows you to filter routes based on attributes such as the destination, origination protocol, route type, route tag, and so on. For more information, see [Chapter 16, “Configuring Route Policy Manager.”](#)

Whenever you redistribute routes into an IS-IS routing domain, Cisco NX-OS does not, by default, redistribute the default route into the IS-IS routing domain. You can generate a *default route* into IS-IS, which can be controlled by a route policy.

You also configure the default metric that is used for all imported routes into IS-IS.

Load Balancing

You can use load balancing to allow a router to distribute traffic over all the router network ports that are the same distance from the destination address. Load balancing increases the utilization of network segments and increases effective network bandwidth.

Cisco NX-OS supports the Equal Cost Multiple Paths (ECMP) feature with up to 16 equal-cost paths in the IS-IS route table and the unicast RIB. You can configure IS-IS to load balance traffic across some or all of those paths.

Virtualization Support

Cisco NX-OS supports multiple instances of the IS-IS protocol that runs on the same system. IS-IS supports Virtual Routing and Forwarding instances (VRFs). VRFs exist within virtual device contexts (VDCs). You can configure up to four IS-IS instances in a VDC.

By default, Cisco NX-OS places you in the default VDC and default VRF unless you specifically configure another VDC and VRF. See the *Cisco Nexus 7000 Series NX-OS Virtual Device Context Configuration Guide, Release 4.xe* and [Chapter 14, “Configuring Layer 3 Virtualization.”](#)

High Availability and Graceful Restart

Cisco NX-OS supports RFC 3847 for graceful restart of IS-IS. IS-IS automatically restarts if the process experiences problems. After the restart, IS-IS initiates a graceful restart so that the platform is not taken out of the network topology. If you manually restart IS-IS, it performs a graceful restart and applies the running configuration.



Note

You must enable graceful restart to support in-service software upgrades (ISSU) for IS-IS. If you disable graceful restart, Cisco NX-OS issues a warning that ISSU cannot be supported with this configuration.

Multiple IS-IS Instances

Cisco NX-OS supports a maximum of four instances of the IS-IS protocol that run on the same node. You cannot configure multiple instances over the same interface. Every instance uses the same system router ID.

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Licensing Requirements for IS-IS

The following table shows the licensing requirements for this feature:

Product	License Requirement
NX-OS	IS-IS requires an Enterprise Services license. For a complete explanation of the NX-OS licensing scheme and how to obtain and apply licenses, see the <i>Cisco NX-OS Licensing Guide</i> .

Prerequisites for IS-IS

IS-IS has the following prerequisites:

- You must enable the IS-IS feature (see the [“Enabling the IS-IS Feature” section on page 9-7](#)).
- If you configure VDCs, install the Advanced Services license and enter the desired VDC (see the *Cisco Nexus 7000 Series NX-OS Virtual Device Context Configuration Guide, Release 4.x*).

Configuration Guidelines and Limitations

IS-IS has the following configuration guidelines and limitations:

- You can configure a maximum of four IS-IS instances per VDC.
- Because the default reference bandwidth is different for Cisco NX-OS and Cisco IOS, the advertised tunnel IS-IS metric is different for these two operating systems.

Configuring IS-IS

To configure IS-IS, follow these steps:

-
- | | |
|---------------|---|
| Step 1 | Enable the IS-IS feature (see the “Enabling the IS-IS Feature” section on page 9-7). |
| Step 2 | Create an IS-IS instance (see the “Creating an IS-IS Instance” section on page 9-8). |
| Step 3 | Add an interface to the IS-IS instance (see the “Configuring IS-IS on an Interface” section on page 9-11). |
| Step 4 | Configure optional features, such as authentication, mesh groups, and dynamic host exchange. |
-

This section contains the following topics:

- [IS-IS Configuration Modes, page 9-7](#)
- [Enabling the IS-IS Feature, page 9-7](#)
- [Creating an IS-IS Instance, page 9-8](#)
- [Restarting an IS-IS Instance, page 9-10](#)
- [Shutting Down IS-IS, page 9-11](#)
- [Configuring IS-IS on an Interface, page 9-11](#)

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- [Shutdown IS-IS on an Interface, page 9-13](#)
- [Configuring IS-IS Authentication in an Area, page 9-13](#)
- [Configuring IS-IS Authentication on an Interface, page 9-14](#)
- [Configuring a Mesh Group, page 9-16](#)
- [Configuring a Designated Intermediate System, page 9-16](#)
- [Configuring Dynamic Host Exchange, page 9-16](#)
- [Setting the Overload Bit, page 9-16](#)
- [Configuring the Attached Bit, page 9-17](#)
- [Configuring a Summary Address, page 9-17](#)
- [Configuring Redistribution, page 9-19](#)
- [Limiting the Number of Redistributed Routes, page 9-20](#)
- [Configuring Virtualization, page 9-23](#)
- [Tuning IS-IS, page 9-26](#)

**Note**

If you are familiar with the Cisco IOS CLI, be aware that the Cisco NX-OS commands for this feature might differ from the Cisco IOS commands that you would use.

IS-IS Configuration Modes

The following sections show how to enter each of the configuration modes. From a mode, you can enter the ? command to display the commands available in that mode.

This section includes the following topics:

- [Router Configuration Mode, page 9-7](#)
- [Router Address Family Configuration Mode, page 9-7](#)

Router Configuration Mode

The following example shows how to enter router configuration mode:

```
switch#: config t
switch(config)# router isis isp
switch(config-router)#
```

Router Address Family Configuration Mode

The following example shows how to enter router address family configuration mode:

```
switch(config)# router isis isp
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)#
```

Enabling the IS-IS Feature

You must enable the IS-IS feature before you can configure IS-IS.

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BEFORE YOU BEGIN

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

SUMMARY STEPS

- 1. **config t**
- 2. **feature isis**
- 3. **show feature**
- 4. **copy running-config startup-config**

DETAILED STEPS

	Command	Purpose
Step 1	config t Example: switch# config t switch(config)#	Enters configuration mode.
Step 2	feature isis Example: switch(config)# feature isis	Enables the IS-IS feature.
Step 3	show feature Example: switch(config)# show feature	(Optional) Displays enabled and disabled features.
Step 4	copy running-config startup-config Example: switch(config)# copy running-config startup-config	(Optional) Saves this configuration change.

Use the **no feature isis** command to disable the IS-IS feature and remove all associated configuration.

Command	Purpose
no feature isis Example: switch(config)# no feature isis	Disables the IS-IS feature and removes all associated configuration.

Creating an IS-IS Instance

You can create an IS-IS instance and configure the area level for that instance.

BEFORE YOU BEGIN

Ensure that you have enabled the IS-IS feature (see the [“Enabling the IS-IS Feature” section on page 9-7](#)).

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

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SUMMARY STEPS

1. **config t**
2. **router isis** *instance-tag*
3. **net** *network-entity-title*
4. **is-type** {*level-1* | *level-2* | *level-1-2*}
5. **show isis** [*vrf vrf-name*] **process**
6. **copy running-config startup-config**

DETAILED STEPS

	Command	Purpose
Step 1	config t Example: switch# config t switch(config)#	Enters configuration mode.
Step 2	router isis <i>instance-tag</i> Example: switch(config)# router isis Enterprise switch(config-router)#	Creates a new IS-IS instance with the configured <i>instance tag</i> .
Step 3	net <i>network-entity-title</i> Example: switch(config-router)# net 47.0004.004d.0001.0001.0c11.1111.00	Configures the NET for this IS-IS instance.
Step 4	is-type { <i>level-1</i> <i>level-2</i> <i>level-1-2</i> } Example: switch(config-router)# is-type level-2	(Optional) Configures the area level for this IS-IS instance. The default is level-1-2.
Step 5	show isis [<i>vrf vrf-name</i>] process Example: switch(config)# show isis process	(Optional) Displays a summary of IS-IS information for all IS-IS instances.
Step 6	copy running-config startup-config Example: switch(config)# copy running-config startup-config	(Optional) Saves this configuration change.

Use the **no router isis** command to remove the IS-IS instance and the associated configuration.

Command	Purpose
no router isis <i>instance-tag</i> Example: switch(config)# no router isis Enterprise	Deletes the IS-IS instance and all associated configuration.

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Note

You must also remove any IS-IS commands configured in interface mode to completely remove all configuration for the IS-IS instance.

You can configure the following optional parameters for IS-IS:

Command	Purpose
distance <i>value</i> Example: switch(config-router)# distance 30	Sets the administrative distance for IS-IS. The range is from 1 to 255. The default is 115. See the “Administrative Distance” section on page 1-7 .
log-adjacency-changes Example: switch(config-router)# log-adjacency-changes	Sends a system message whenever an IS-IS neighbor changes state.
lsp-mtu <i>size</i> Example: switch(config-router)# lsp-mtu 600	Sets the MTU for LSPs in this IS-IS instance. The range is from 128 to 4352 bytes. The default is 1492.
maximum-paths <i>number</i> Example: switch(config-router)# maximum-paths 6	Configures the maximum number of equal-cost paths that IS-IS maintains in the route table. The range is from 1 to 16. The default is 4.
reference-bandwidth <i>bandwidth-value</i> {Mbps Gbps} Example: switch(config-router)# reference-bandwidth 100 Gbps	Sets the default reference bandwidth used for calculating the IS-IS cost metric. The range is from 1 to 4000 Gbps. The default is 40 Gbps.

The following example shows how to create an IS-IS instance in a level 2 area:

```
switch# config t
switch(config)# router isis Enterprise
switch(config-router)# net 47.0004.004d.0001.0001.0c11.1111.00
switch(config-router)# is-type level 2
switch(config-router)# copy running-config startup-config
```

To clear neighbor statistics and remove adjacencies, use the following command in router configuration mode:

Command	Purpose
clear isis [<i>instance-tag</i>] adjacency [* <i>system-id</i> <i>interface</i>] Example: switch(config-if)# clear isis adjacency *	Clears neighbor statistics and removed adjacencies for this IS-IS instance.

Restarting an IS-IS Instance

You can restart an IS-IS instance. This clears all neighbors for the instance.

To restart an IS-IS instance and remove all associated neighbors, use the following command:

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Command	Purpose
restart isis instance-tag	Restarts the IS-IS instance and removes all neighbors.
Example: switch(config)# restart isis Enterprise	

Shutting Down IS-IS

You can shut down the IS-IS instance. This disables this IS-IS instance and retains the configuration. To shut down the IS-IS instance, use the following command in router configuration mode:

Command	Purpose
shutdown	Disables the IS-IS instance.
Example: switch(config-router)# shutdown	

Configuring IS-IS on an Interface

You can add an interface to an IS-IS instance.

BEFORE YOU BEGIN

Ensure that you have enabled the IS-IS feature (see the [“Enabling the IS-IS Feature”](#) section on page 9-7).

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

SUMMARY STEPS

1. **config t**
2. **interface** *interface-type slot/port*
3. **medium { broadcast | p2p }** (Optional)
4. **ip router isis** *instance-tag*
5. **show isis [vrf vrf-name] [instance-tag] interface [interface-type slot/port]**
6. **copy running-config startup-config**

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DETAILED STEPS

	Command	Purpose
Step 1	config t Example: switch# config t switch(config)#	Enters configuration mode.
Step 2	interface interface-type slot/port Example: switch(config)# interface ethernet 1/2 switch(config-if)#	Enters interface configuration mode.
Step 3	medium {broadcast p2p} Example: switch(config-if)# medium p2p	(Optional) Configures the broadcast or point-to-point mode for the interface. IS-IS inherits this mode.
Step 4	ip router isis instance-tag Example: switch(config-if)# ip router isis Enterprise	Associates this IPv4 interface with an IS-IS instance.
Step 5	show isis [vrf vrf-name] [instance-tag] interface [interface-type slot/port] Example: switch(config-if)# show isis Enterprise ethernet 1/2	(Optional) Displays IS-IS information for an interface.
Step 6	copy running-config startup-config Example: switch(config)# copy running-config startup-config	(Optional) Saves this configuration change.

You can configure the following optional parameters for IS-IS in interface mode:

Command	Purpose
isis circuit-type {level-1 level-2 level-1-2} Example: switch(config-if)# isis circuit-type level-2	Sets the type of adjacency that this interface participates in. Use this command only for routers that participate in both Level 1 and Level 2 areas.
isis metric value {level-1 level-2} Example: switch(config-if)# isis metric 30	Sets the IS-IS metric for this interface. The range is from 1 to 16777214. The default is 10.
isis passive {level-1 level-2 level-1-2} Example: switch(config-if)# isis passive level-2	Prevents the interface from forming adjacencies but still advertises the prefix associated with the interface.

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The following example shows how to add Ethernet 1/2 interface to an IS-IS instance:

```
switch# config t
switch(config)# interface ethernet 1/2
switch(config-if)# ip router isis Enterprise
switch(config-if)# copy running-config startup-config
```

Shutdown IS-IS on an Interface

You can gracefully shut down IS-IS on an interface. This removes all adjacencies and stops IS-IS traffic on this interface but preserves the IS-IS configuration.

To disable IS-IS on an interface, use the following command in interface configuration mode:

Command	Purpose
switch(config-if)# isis shutdown	Disables IS-IS on this interface. The IS-IS interface configuration remains.
Example: switch(config-router)# isis shutdown	

Configuring IS-IS Authentication in an Area

You can configure IS-IS to authenticate LSPs in an area.

BEFORE YOU BEGIN

Ensure that you have enabled the IS-IS feature (see the [“Enabling the IS-IS Feature”](#) section on page 9-7).

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

SUMMARY STEPS

1. **config t**
2. **router isis** *instance-tag*
3. **authentication-type** {cleartext | md5} {level-1 | level-2}
4. **authentication key-chain** *key* {level-1 | level-2}
5. **authentication-check** {level-1 | level-2}
6. **copy running-config startup-config**

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DETAILED STEPS

	Command	Purpose
Step 1	config t Example: switch# config t switch(config)#	Enters configuration mode.
Step 2	router isis <i>instance-tag</i> Example: switch(config)# router isis Enterprise switch(config-router)#	Creates a new IS-IS instance with the configured <i>instance tag</i> .
Step 3	authentication-type {cleartext md5} {level-1 level-2} Example: switch(config-router)# authentication-type cleartext level-2	Sets the authentication method used for a Level 1 or Level 2 area as cleartext or as an MD5 authentication digest.
Step 4	authentication key-chain <i>key</i> {level-1 level-2} Example: switch(config-router)# authentication key-chain ISISKey level-2	Configures the authentication key used for an IS-IS area-level authentication.
Step 5	authentication-check {level-1 level-2} Example: switch(config-router)# authentication-check level-2	(Optional) Enables checking the authentication parameters in a received packet.
Step 6	copy running-config startup-config Example: switch(config-router)# copy running-config startup-config	(Optional) Saves this configuration change.

The following example shows how to configure cleartext authentication on an IS-IS instance:

```
switch# config t
switch(config)# router isis Enterprise
switch(config-router)# authentication-type cleartext level-2
switch(config-router)# authentication key-chain ISISKey level-2
switch(config-router)# copy running-config startup-config
```

Configuring IS-IS Authentication on an Interface

You can configure IS-IS to authenticate Hello packets on an interface.

BEFORE YOU BEGIN

Ensure that you have enabled the IS-IS feature (see the “[Enabling the IS-IS Feature](#)” section on [page 9-7](#)).

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

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SUMMARY STEPS

1. **config t**
2. **interface** *interface-type slot/port*
3. **isis authentication-type** {cleartext | md5} {level-1 | level-2}
4. **isis authentication key-chain** *key* {level-1 | level-2}
5. **isis authentication-check** {level-1 | level-2}
6. **copy running-config startup-config**

DETAILED STEPS

	Command	Purpose
Step 1	config t Example: switch# config t switch(config)#	Enters configuration mode.
Step 2	interface <i>interface-type slot/port</i> Example: switch(config)# interface ethernet 1/2 switch(config-if)#	Enters interface configuration mode.
Step 3	isis authentication-type {cleartext md5} {level-1 level-2} Example: switch(config-if)# isis authentication-type cleartext level-2	Sets the authentication type for IS-IS on this interface as cleartext or as an MD5 authentication digest.
Step 4	isis authentication key-chain <i>key</i> {level-1 level-2} Example: switch(config-if)# isis authentication-key ISISKey level-2	Configures the authentication key used for IS-IS on this interface.
Step 5	isis authentication-check {level-1 level-2} Example: switch(config-if)# isis authentication-check	Optional) Enables checking the authentication parameters in a received packet.
Step 6	copy running-config startup-config Example: switch(config-if)# copy running-config startup-config	(Optional) Saves this configuration change.

The following example shows how to configure cleartext authentication on an IS-IS instance:

```
switch# config t
switch(config)# interface ethernet 1/2
switch(config-if)# isis authentication-type cleartext level-2
switch(config-if)# isis authentication key-chain ISISKey
switch(config-if)# copy running-config startup-config
```

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Configuring a Mesh Group

You can add an interface to a mesh group to limit the amount of LSP flooding for interfaces in that mesh group. You can optionally block all LSP flooding on an interface in a mesh group.

To add an interface to a mesh group, use the following command in interface configuration mode:

Command	Purpose
isis mesh-group { blocked <i>mesh-id</i> }	Adds this interface to a mesh group. The range is from 1 to 4294967295.
Example: switch(config-if)# isis mesh-group 1	

Configuring a Designated Intermediate System

You can configure a router to become the designated intermediate system (DIS) for a multiaccess network by setting the interface priority.

To configure the DIS, use the following command in interface configuration mode:

Command	Purpose
isis priority <i>number</i> { level-1 level-2 }	Sets the priority for DIS selection. The range is from 0 to 127. The default is 64.
Example: switch(config-if)# isis priority 100 level-1	

Configuring Dynamic Host Exchange

You can configure IS-IS to map between the system ID and the hostname for a router using dynamic host exchange.

To configure dynamic host exchange, use the following command in router configuration mode:

Command	Purpose
hostname dynamic	Enables dynamic host exchange.
Example: switch(config-router)# hostname dynamic	

Setting the Overload Bit

You can configure the router to signal other routers not to use this router as an intermediate hop in their shortest path first (SPF) calculations. You can optionally configure the overload bit temporarily on startup, until BGP converges.

In addition to setting the overload bit, you might also want to suppress certain types of IP prefix advertisements from LSPs for Level 1 or Level 2 traffic.

To set the overload bit, use the following command in router configuration mode:

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Command	Purpose
set-overload-bit { always on-startup { <i>seconds</i> wait-for bgp <i>as-number</i> }} [suppress [<i>interlevel</i> <i>external</i>]] Example: switch(config-router)# set-overload-bit on-startup 30	Sets the overload bit for IS-IS. The <i>seconds</i> range is from 5 to 86400.

Configuring the Attached Bit

You can configure the attached bit to control which Level1/Level2 router that the Level 1 routers use as the default route to the Level 2 area. If you disable setting the attached bit, the Level 1 routers will not use this Level1/Level 2 router to reach the Level 2 area.

To configure the attached bit for a Level1/Level2 router, use the following command in router configuration mode:

Command	Purpose
[no] attached-bit Example: switch(config-router)# no attached-bit	Configures the Level1/Level 2 router to set the attached bit. This is enabled by default.

Configuring the Transient Mode for Hello Padding

You can configure the transient mode for hello padding to pad hello packets when IS-IS establishes adjacency and remove that padding after IS-IS establishes adjacency.

To configure the mode for hello padding, use the following command in router configuration mode:

Command	Purpose
[no] isis hello-padding Example: switch(config-if)# no isis hello-padding	Pads the hello packet to the full MTU. The default is enabled. Use the no form of this command to configure the transient mode of hello padding.

Configuring a Summary Address

You can create aggregate addresses that are represented in the routing table by a summary address. One summary address can include multiple groups of addresses for a given level. Cisco NX-OS advertises the smallest metric of all the more-specific routes.

BEFORE YOU BEGIN

Ensure that you have enabled the IS-IS feature (see the [“Enabling the IS-IS Feature”](#) section on page 9-7).

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

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SUMMARY STEPS

1. **config t**
2. **router isis *instance-tag***
3. **address-family ipv4 {unicast | multicast}**
4. **summary-address *ip-prefix/mask-len* {level-1 | level-2 | level-1-2}**
5. **show isis [*vrf vrf-name*] ip summary-address *ip-prefix* [*longer-prefixes*]**
6. **copy running-config startup-config**

DETAILED STEPS

	Command	Purpose
Step 1	config t Example: switch# config t switch(config)#	Enters configuration mode.
Step 2	router isis <i>instance-tag</i> Example: switch(config)# router isis Enterprise switch(config-router)#	Creates a new IS-IS instance with the configured <i>instance tag</i> .
Step 3	address-family ipv4 {unicast multicast} Example: switch(config-router)# address-family ipv4 unicast switch(config-router-af)#	Enters address family configuration mode.
Step 4	summary-address <i>ip-prefix/mask-len</i> {level-1 level-2 level-1-2} Example: switch(config-router-af)# summary-address 192.0.2.0/24 level-2	Configures a summary address for an ISIS area for IPv4 addresses.
Step 5	show isis [<i>vrf vrf-name</i>] ip summary-address <i>ip-prefix</i> [<i>longer-prefixes</i>] Example: switch(config-if)# show isis ip summary-address	(Optional) Displays IS-IS IPv4 summary address information.
Step 6	copy running-config startup-config Example: switch(config--if)# copy running-config startup-config	(Optional) Saves this configuration change.

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The following example shows how to configure an IPv4 unicast summary address for IS-IS:

```
switch# config t
switch(config)# router isis Enterprise
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# summary-address 192.0.2.0/24 level-2
switch(config-router-af)# copy running-config startup-config
```

Configuring Redistribution

You can configure IS-IS to accept routing information from another routing protocol and redistribute that information through the IS-IS network. You can optionally assign a default route for redistributed routes.

BEFORE YOU BEGIN

Ensure that you have enabled the IS-IS feature (see the [“Enabling the IS-IS Feature”](#) section on page 9-7).

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

SUMMARY STEPS

1. **config t**
2. **router isis** *instance-tag*
3. **address-family ipv4 unicast**
4. **redistribute** {bgp *as* | direct | {eigrp | isis | ospf | ospfv3 | rip} *instance-tag* | static} **route-map** *map-name*
5. **default-information originate** [always] [route-map *map-name*]
6. **distribute** {level-1 | level-2} **into** {level-1 | level-2} {route-map *route-map* | all}
7. **show isis** [vrf *vrf-name*] **ip route** *ip-prefix* [*detail* | longer-prefixes [summary | detail]]
8. **copy running-config startup-config**

DETAILED STEPS

	Command	Purpose
Step 1	config t Example: switch# config t switch(config)#	Enters configuration mode.
Step 2	router isis <i>instance-tag</i> Example: switch(config)# router isis Enterprise switch(config-router)#	Creates a new IS-IS instance with the configured <i>instance tag</i> .

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	Command	Purpose
Step 3	address-family ipv4 unicast Example: switch(config-router)# address-family ipv4 unicast switch(config-router-af)#	Enters address family configuration mode.
Step 4	redistribute {bgp as {eigrp isis ospf ospfv3 rip} instance-tag static direct} route-map map-name Example: switch(config-router-af)# redistribute eigrp 201 route-map ISISmap	Redistributes routes from other protocols into IS-IS. See the “ Configuring Route Maps ” section on page 16-11 for more information about route maps.
Step 5	default-information originate [always] [route-map map-name] Example: switch(config-router-af)# default-information originate always	(Optional) Generates a default route into IS-IS.
Step 6	distribute {level-1 level-2} into {level-1 level-2} {route-map route-map all} Example: switch(config-router-af)# distribute level-1 into level-2 all	(Optional) Redistributes routes from one IS-IS level to the other IS-IS level.
Step 7	show isis [vrf vrf-name] ip route ip-prefix [detail longer-prefixes [summary detail]] Example: switch(config-router-af)# show isis ip route	(Optional) Shows the routes IS-IS.
Step 8	copy running-config startup-config Example: switch(config-router-af)# copy running-config startup-config	(Optional) Saves this configuration change.

The following example shows how to redistribute EIGRP into IS-IS:

```
switch# config t
switch(config)# router isis Enterprise
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# redistribute eigrp 201 route-map ISISmap
switch(config-router-af)# copy running-config startup-config
```

Limiting the Number of Redistributed Routes

Route redistribution can add many routes to the IS-IS route table. You can configure a maximum limit to the number of routes accepted from external protocols. IS-IS provides the following options to configure redistributed route limits:

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- **Fixed limit**—Log a message when IS-IS reaches the maximum the configured maximum. IS-IS does not accept any more redistributed routes. You can optionally configure a threshold percentage of the maximum where IS-IS will log a warning when that threshold is passed.
- **Warning only**—Log a warning only when IS-IS reaches the maximum. IS-IS continues to accept redistributed routes.
- **Withdraw**—Start the timeout period when IS-IS reaches the maximum. After the timeout period, IS-IS requests all redistributed routes if the current number of redistributed routes is less than the maximum limit. If the current number of redistributed routes is at the maximum limit, IS-IS withdraws all redistributed routes. You must clear this condition before IS-IS accepts more redistributed routes.
You can optionally configure the timeout period.

BEFORE YOU BEGIN

Ensure that you have enabled the IS-IS feature (see the [“Enabling the IS-IS Feature”](#) section on page 9-7).

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

SUMMARY STEPS

1. **config t**
2. **router is-is *instance-tag***
3. **redistribute {bgp *id* | direct | eigrp *id* | isis *id* | ospf *id* | rip *id* | static} route-map *map-name***
4. **redistribute maximum-prefix *max* [*threshold*] [warning-only | withdraw [*num-retries* *timeout*]]**
5. **show running-config eigrp**
6. **copy running-config startup-config**

DETAILED STEPS

	Command	Purpose
Step 1	config t Example: switch# config t switch(config)#	Enters configuration mode.
Step 2	router eigrp <i>instance-tag</i> Example: switch(config)# router isis Enterprise switch(config-router)#	Creates a new IS-IS instance with the configured instance tag.
Step 3	redistribute {bgp <i>id</i> direct eigrp <i>id</i> isis <i>id</i> ospf <i>id</i> rip <i>id</i> static} route-map <i>map-name</i> Example: switch(config-router)# redistribute bgp route-map FilterExternalBGP	Redistributes the selected protocol into IS-IS through the configured route map.

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	Command	Purpose
Step 4	redistribute maximum-prefix <i>max</i> <code>[threshold] [warning-only withdraw</code> <code>[num-retries timeout]]</code> Example: <pre>switch(config-router)# redistribute maximum-prefix 1000 75 warning-only</pre>	Specifies a maximum number of prefixes that IS-IS will distribute. The range is from 0 to 65536. Optionally specifies the following: • threshold—Percent of maximum prefixes that will trigger a warning message. • warning-only—Logs an warning message when the maximum number of prefixes is exceeded. • withdraw—Withdraws all redistributed routes. Optionally tries to retrieve the redistributed routes. The <i>num-retries</i> range is from 1 to 12. The <i>timeout</i> is 60 to 600 seconds. The default is 300 seconds. Use clear isis redistribution if all routes are withdrawn.
Step 5	show running-config isis Example: <pre>switch(config-router)# show running-config isis</pre>	(Optional) Displays the IS-IS configuration.
Step 6	copy running-config startup-config Example: <pre>switch(config-router)# copy running-config startup-config</pre>	(Optional) Saves this configuration change.

The following example shows how to limit the number of redistributed routes into IS-IS:

```
switch# config t
switch(config)# router eigrp isis Enterprise
switch(config-router)# redistribute bgp route-map FilterExternalBGP
switch(config-router)# redistribute maximum-prefix 1000 75
```

Configuring a Graceful Restart

You can configure a graceful restart for IS-IS.

BEFORE YOU BEGIN

Ensure that you have enabled the IS-IS feature (see the [“Enabling the IS-IS Feature”](#) section on page 9-7).

Create the VDCs and VRFs.

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

SUMMARY STEPS

1. **config t**
2. **router isis** *instance-tag*
3. **graceful-restart**
4. **graceful-restart t3 manual** *time*

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5. `show running-config isis`
6. `copy running-config startup-config`

DETAILED STEPS

	Command	Purpose
Step 1	<code>config t</code> Example: <code>switch# config t</code> <code>switch(config)#</code>	Enters configuration mode.
Step 2	<code>router isis instance-tag</code> Example: <code>switch(config)# router isis Enterprise</code> <code>switch(config-router)#</code>	Creates a new IS-IS process with the configured name.
Step 3	<code>graceful-restart</code> Example: <code>switch(config-router)# graceful-restart</code>	Enables a graceful restart and the graceful restart helper functionality. Enabled by default.
Step 4	<code>graceful-restart t3 manual time</code> Example: <code>switch(config-router)# graceful-restart t3 manual 300</code>	Configures the graceful restart T3 timer. The range is from 30 to 65535 seconds. The default is 60.
Step 5	<code>show running-config isis</code> Example: <code>switch(config-router)# show running-config isis</code>	(Optional) Displays the IS-IS configuration.
Step 6	<code>copy running-config startup-config</code> Example: <code>switch(config-router)# copy running-config startup-config</code>	(Optional) Saves this configuration change.

The following example shows how to enable a graceful restart:

```
switch# config t
switch(config)# router isis Enterprise
switch(config-router)# graceful-restart
switch(config-router)# copy running-config startup-config
```

Configuring Virtualization

You can configure multiple IS-IS instances in each VDC. You can also create multiple VRFs within each VDC and use the same or multiple IS-IS instances in each VRF. You assign an IS-IS interface to a VRF. You must configure a NET for the configured VRF.



Note

Configure all other parameters for an interface after you configure the VRF for an interface. Configuring a VRF for an interface deletes all the configuration for that interface.

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BEFORE YOU BEGIN

Ensure that you have enabled the IS-IS feature (see the “Enabling the IS-IS Feature” section on [page 9-7](#)).

Create the VDCs.

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

SUMMARY STEPS

- 1. **config t**
- 2. **vrf context** *vrf_name*
- 3. **exit**
- 4. **router isis** *instance-tag*
- 5. **vrf** *vrf_name*
- 6. **net** *network-entity-title*
- 7. **exit**
- 8. **interface** *type slot/port*
- 9. **vrf member** *vrf-name*
- 10. **ip address** *ip-prefix/length*
- 11. **ip router isis** *instance-tag*
- 12. **show isis** [**vrf** *vrf-name*] [*instance-tag*] **interface** [*interface-type slot/port*]
- 13. **copy running-config startup-config**

DETAILED STEPS

	Command	Purpose
Step 1	config t Example: switch# config t switch(config)#	Enters configuration mode.
Step 2	vrf context <i>vrf-name</i> Example: switch(config)# vrf context RemoteOfficeVRF switch(config-vrf)#	Creates a new VRF and enters VRF configuration mode.
Step 3	exit Example: switch(config-vrf)# exit switch(config)#	Exits VRF configuration mode.
Step 4	router isis <i>instance-tag</i> Example: switch(config)# router isis Enterprise switch(config-router)#	Creates a new IS-IS instance with the configured instance tag.

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	Command	Purpose
Step 5	vrf <i>vrf-name</i> Example: switch(config-router)# vrf RemoteOfficeVRF switch(config-router-vrf)#	(Optional) Enters VRF configuration mode.
Step 6	net <i>network-entity-title</i> Example: switch(config-router-vrf)# net 47.0004.004d.0001.0001.0c11.1111.00	Configures the NET for this IS-IS instance.
Step 7	exit Example: switch(config-router-vrf)# exit switch(config-router)#	Exits router VRF configuration mode.
Step 8	interface ethernet <i>slot/port</i> Example: switch(config)# interface ethernet 1/2 switch(config-if)#	Enters interface configuration mode.
Step 9	vrf member <i>vrf-name</i> Example: switch(config-if)# vrf member RemoteOfficeVRF	Adds this interface to a VRF.
Step 10	ip address <i>ip-prefix/length</i> Example: switch(config-if)# ip address 192.0.2.1/16	Configures an IP address for this interface. You must do this step after you assign this interface to a VRF.
Step 11	ip router isis <i>instance-tag</i> Example: switch(config-if)# ip router isis Enterprise	Associates this IPv4 interface with an IS-IS instance.
Step 12	show isis [<i>vrf vrf-name</i>] [<i>instance-tag</i>] interface [<i>interface-type slot/port</i>] Example: switch(config-if)# show isis Enterprise ethernet 1/2	(Optional) Displays IS-IS information for an interface. in a VRF.
Step 13	copy running-config startup-config Example: switch(config-if)# copy running-config startup-config	(Optional) Saves this configuration change.

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The following example shows how to create a VRF and add an interface to the VRF:

```
switch# config t
switch(config)# vrf context NewVRF
switch(config-vrf)# exit
switch(config)# router isis Enterprise
switch(config-router)# vrf NewVRF
switch(config-router-vrf)# net 47.0004.004d.0001.0001.0c11.1111.00
switch(config-router-vrf)# interface ethernet 1/2
switch(config-if)# vrf member NewVRF
switch(config-if)# ip address 192.0.2.1/16
switch(config-if)# ip router isis Enterprise
switch(config-if)# copy running-config startup-config
```

Tuning IS-IS

You can tune IS-IS to match your network requirements.

You can use the following optional commands in router configuration mode to tune IS-IS:

Command	Purpose
lsp-gen-interval [level-1 level-2] <i>lsp-max-wait</i> [<i>lsp-initial-wait</i> <i>lsp-second-wait</i>] Example: switch(config-router)# lsp-gen-interval level-1 500 500 500	Configures the IS-IS throttle for LSP generation. The optional parameters are as follows: - lsp-max-wait—The maximum wait between the trigger and LSP generation. The range is from 500 to 65535 milliseconds. - lsp-initial-wait—The initial wait between the trigger and LSP generation. The range is from 50 to 65535 milliseconds. - lsp-second-wait—The second wait used for LSP throttle during backoff. The range is from 50 to 65535 milliseconds.
max-lsp-lifetime <i>lifetime</i> Example: switch(config-router)# max-lsp-lifetime 500	Sets the maximum LSP lifetime in seconds. The range is from 1 to 65535. The default is 1200.
metric-style transition Example: switch(config-router)# metric-style transition	Enables IS-IS to generate and accept both narrow metric-style Type Length Value (TLV) objects and wide metric-style TLV objects. The default is disabled.

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Command	Purpose
spf-interval [level-1 level-2] <i>spf-max-wait</i> [<i>spf-initial-wait</i> <i>spf-second-wait</i>] Example: switch(config-router)# spf-interval level-2 500 500 500	Configures the interval between LSA arrivals. The optional parameters are as follows: • <i>lsp-max-wait</i>—The maximum wait between the trigger and SPF computation. The range is from 500 to 65535 milliseconds. • <i>lsp-initial-wait</i>—The initial wait between the trigger and SPF computation. The range is from 50 to 65535 milliseconds. • <i>lsp-second-wait</i>—The second wait used for SPF computation during backoff. The range is from 50 to 65535 milliseconds.

You can use the following optional command in router address configuration mode:

Command	Purpose
adjacency-check Example: switch(config-router-af)# adjacency-check	Performs an adjacency check to verify that an IS-IS instance forms an adjacency only with a remote IS-IS entity that supports the same address family. Enabled by default.

You can use the following optional commands in interface configuration mode to tune IS-IS:

Command	Purpose
isis csnp-interval <i>seconds</i> [level-1 level-2] Example: switch(config-if)# isis csnp-interval 20	Sets the Complete sequence number PDU (CSNP) interval in seconds for IS-IS. The range is from 1 to 65535. The default is 10.
isis hello-interval <i>seconds</i> [level-1 level-2] Example: switch(config-if)# isis hello-interval 20	Sets the hello interval in seconds for IS-IS. The range is from 1 to 65535. The default is 10.
isis hello-multiplier <i>num</i> [level-1 level-2] Example: switch(config-if)# isis hello-multiplier 20	Specifies the number of IS-IS hello packets that a neighbor must miss before the router tears down an adjacency. The range is from 3 to 1000. The default is 3.
isis lsp-interval <i>milliseconds</i> Example: switch(config-if)# isis lsp-interval 20	Sets the interval in milliseconds between LSPs sent on this interface during flooding. The range is from 10 to 65535. The default is 33.

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Verifying IS-IS Configuration

To verify the IS-IS configuration, use the following commands:

Command	Purpose
show isis [<i>instance-tag</i>] adjacency [<i>interface</i>] [detail summary] [vrf <i>vrf-name</i>]	Displays the IS-IS adjacencies. Use the clear isis adjacency command to clear these statistics.
show isis [<i>instance-tag</i>] database [level-1 level-2] [detail summary] [<i>LSP ID</i>] {[ip prefix <i>ip-prefix</i>] [router-id <i>router-id</i>] [adjacency node-id] [zero-sequence] } [vrf <i>vrf-name</i>]	Displays the IS-IS LSP database.
show isis [<i>instance-tag</i>] hostname [vrf <i>vrf-name</i>]	Displays the dynamic host exchange information.
show isis [<i>instance-tag</i>] interface [brief <i>interface</i>] [level-1 level-2] [vrf <i>vrf-name</i>]	Displays the IS-IS interface information.
show isis [<i>instance-tag</i>] mesh-group [<i>mesh-id</i>] [vrf <i>vrf-name</i>]	Displays the mesh group information.
show isis [<i>instance-tag</i>] protocol [vrf <i>vrf-name</i>]	Displays information about the IS-IS protocol.
show isis [<i>instance-tag</i>] ip redistribute route [<i>ip-address</i> summary] [[<i>ip-prefix</i>] [longer-prefixes summary]] [vrf <i>vrf-name</i>]	Displays the IS-IS route redistribution information.
show isis [<i>instance-tag</i>] ip route [<i>ip-address</i> summary] [<i>ip-prefix</i>] [longer-prefixes summary]] [detail] [vrf <i>vrf-name</i>]	Displays the IS-IS route table.
show isis [<i>instance-tag</i>] rrm [<i>interface</i>] [vrf <i>vrf-name</i>]	Displays the IS-IS interface retransmission information.
show isis [<i>instance-tag</i>] srm [<i>interface</i>] [vrf <i>vrf-name</i>]	Displays the IS-IS interface flooding information.
show isis [<i>instance-tag</i>] ssn [<i>interface</i>] [vrf <i>vrf-name</i>]	Displays the IS-IS interface PSNP information.
show isis [<i>instance-tag</i>][ip summary-address [<i>ip-address</i>] [<i>ip-prefix</i>]] [vrf <i>vrf-name</i>]	Displays IS-IS the summary address information.
show running-configuration isis	Displays the current running IS-IS configuration.
show tech-support isis [detail]	Displays the technical support details for IS-IS.

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

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Displaying IS-IS Statistics

To display IS-IS statistics, use the following commands:

Command	Purpose
show isis [<i>instance-tag</i>] adjacency [<i>interface</i>] [system-ID] [detail] [summary] [vrf <i>vrf-name</i>]	Displays the IS-IS adjacency statistics.
show isis [<i>instance-tag</i>] database [level-1 level-2] [detail summary] [<i>lsip</i>] {[adjacency id] ip prefix <i>prefix</i>] [router-id <i>id</i>] [zero-sequence] [vrf <i>vrf-name</i>]	Displays the IS-IS database statistics.
show isis [<i>instance-tag</i>] statistics [<i>interface</i>] [vrf <i>vrf-name</i>]	Displays the IS-IS interface statistics.
show isis ip route-map statistics redistribute { bgp <i>id</i> eigrp <i>id</i> isis <i>id</i> ospf <i>id</i> rip <i>id</i> static } [vrf <i>vrf-name</i>]	Displays the IS-IS redistribution statistics
show isis route-map statistics distribute { level-1 level-2 } into { level-1 level-2 } [vrf <i>vrf-name</i>]	Displays IS-IS distribution statistics for routes distributed between levels.
show isis [<i>instance-tag</i>] spf-log [detail] [vrf <i>vrf-name</i>]	Displays the IS-IS SPF calculation statistics.
show isis [<i>instance-tag</i>] traffic [<i>interface</i>] [vrf <i>vrf-name</i>]	Displays the IS-IS traffic statistics.

To clear IS-IS configuration statistics, perform one of the following tasks:

Command	Purpose
clear isis [<i>instance-tag</i>] adjacency [* [<i>interface</i>]] [system-id <i>id</i>] [vrf <i>vrf-name</i>]	Clears the IS-IS adjacency statistics.
clear isis ip route-map statistics redistribute { bgp <i>id</i> direct eigrp <i>id</i> isis <i>id</i> ospf <i>id</i> rip <i>id</i> static } [vrf <i>vrf-name</i>]	Clears the IS-IS redistribution statistics
clear isis route-map statistics distribute { level-1 level-2 } into { level-1 level-2 } [vrf <i>vrf-name</i>]	Clears IS-IS distribution statistics for routes distributed between levels.
clear isis [<i>instance-tag</i>] statistics [* <i>interface</i>] [vrf <i>vrf-name</i>]	Clears the IS-IS interface statistics.
clear isis [<i>instance-tag</i>] traffic [* <i>interface</i>] [vrf <i>vrf-name</i>]	Clears the IS-IS traffic statistics.

IS-IS Example Configuration

The following example shows how to configure IS-IS:

```
router isis Enterprise
```

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```

is-type level-1
net 49.0001.0000.0000.0003.00
graceful-restart
address-family ipv4 unicast
default-information originate

interface ethernet 2/1
ip address 192.0.2.1/24
isis circuit-type level-1
ip router isis Enterprise

```

Related Topics

See the [Chapter 16, “Configuring Route Policy Manager”](#) for more information on route maps.

Default Settings

[Table 9-1](#) lists the default settings for IS-IS parameters.

Table 9-1 *Default IS-IS Parameters*

Parameters	Default
Administrative distance	115
Area level	level-1-2
DIS priority	64
Graceful restart	enabled
Hello multiplier	3
Hello padding	enabled
Hello time	10 seconds
IS-IS feature	disabled
LSP interval	33
LSP MTU	1492
Maximum LSP lifetime	1200 seconds
Maximum paths	4
Metric	10
Reference bandwidth	40 Gbps

Additional References

For additional information related to implementing IS-IS, see the following sections:

- [Related Documents, page 9-31](#)
- [Standards, page 9-31](#)

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Related Documents

Related Topic	Document Title
IS-IS CLI commands	<i>Cisco Nexus 7000 Series NX-OS Unicast Routing Command Reference</i>
VDCs and VRFs	<i>Cisco Nexus 7000 Series NX-OS Virtual Device Context Configuration Guide, Release 4.x</i>

Standards

Standards	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

Feature History for IS-IS

Table 9-2 lists the release history for this feature.

Table 9-2 Feature History for IS-IS

Feature Name	Releases	Feature Information
Graceful shutdown	4.2(1)	Added support to gracefully shut down an IS-IS instance or IS-IS on an interface but preserve the IS-IS configuration.
Limits on redistributed routes	4.2(1)	Added support for limiting the number of redistributed routes.
Transient mode for hello padding	4.1(2)	Added support to set or unset the hello padding mode.
Attached bit	4.1(2)	Added support to set or unset the attached bit.
IS-IS	4.0(1)	This feature was introduced.

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