Area Command in Interface Mode for OSPFv2

First Published: August 09, 2004
Last Updated: February 19, 2007

This document describes how to enable Open Shortest Path First version 2 (OSPFv2) on a per-interface basis to simplify the configuration of unnumbered interfaces. The **ip ospf area** command allows you to enable OSPFv2 explicitly on an interface. The **ip ospf area** command is an alternative to enabling OSPFv2 through the address of the interface that matches the address range specified by the **network area** command.

Finding Feature Information in This Module

Your Cisco IOS software release may not support all of the features documented in this module. To reach links to specific feature documentation in this module and to see a list of the releases in which each feature is supported, use the "Feature Information for Area Command in Interface Mode for OSPFv2" section on page 9.

Finding Support Information for Platforms and Cisco IOS and Catalyst OS Software Images

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

Contents

Americas Headquarters:
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

Prerequisites for Area Command in Interface Mode for OSPFv2

OSPFv2 must be running on your network.

Restrictions for Area Command in Interface Mode for OSPFv2

The **ip ospf area** command is supported only for OSPFv2.

Information About Area Command in Interface Mode for OSPFv2

This section contains the following information:

Benefits of Area Command in Interface Mode for OSPFv2 Feature

OSPF is enabled on an interface when the network address for the interface matches the range of addresses that is specified by the **network area** command that is entered in router configuration mode. You can enable OSPFv2 explicitly on an interface with the **ip ospf area** command that is entered in interface configuration mode. This capability simplifies the configuration of unnumbered interfaces with different areas.

Because the **ip ospf area** command is configured explicitly for an interface, it will supersede the effects of the **network area** command that is entered at the network level to affect the interfaces whose addresses fall within the address range specified for the **network area** command.

If you later disable the **ip ospf area** command, the interface still will run OSPFv2 as long as its network address matches the range of addresses that is specified by the **network area** command.

Configuration Guidelines for the Area Command in Interface Mode for OSPFv2 Feature

When you use the **ip ospf area** command in interface configuration mode to enable OSPFv2 on an interface, we recommend that you be familiar with the following guidelines.

Interface Is Already OSPFv2-Enabled by network area Command with Same Area and Process

If you enter the **ip ospf area** command on an interface that is enabled in OSPFv2 by the **network area** command, the process ID or area ID of the interface does not change, and the interface status will not be changed. However, the interface will be flagged as being configured from interface configuration mode and the configuration data will be saved in the interface description block (IDB).

Interface Is Already Configured by network area Command with Different Area or Process

If you enter the **ip ospf area** command on an interface that is enabled in OSPFv2 by the **network area** command, but change the configuration by changing the process ID and area ID of the interface, after the new configuration information is stored in the IDB, the interface will be removed and reattached. Therefore, the interface will be removed from the original area and process and be added to the new ones. The state of the interface will also be reset.

Interface Is Not Configured by network area Command

If the interface is not enabled in OSPFv2 by the **network area** command, the area and OSPF router instance will be created if needed. When the router is reloaded, the OSPF process will not begin running until system initialization is complete. To remove an OSPF router instance, enter the **no router ospf** command. Removing the **ip ospf area** command in interface mode will not result in removing an OSPF router instance.

Removing an interface enable Command

When the **interface enable** command is removed, the interface will be detached from the area. The area will be removed if it has no other attached interfaces. If the interface address is covered by the **network area** command, the interface will be enabled once again in the area for the network that it is in.

New Processes

If an OSPF process does not already exist, and a router ID cannot be chosen when either the **router ospf** command or the **interface** command is configured, a Proximity Database (PDB) and a process will be created, but the process will be inactive. The process will become active when a router ID is chosen, either when it is explicitly configured using the **router-id** command or when an IP address becomes available. Note that the **router ospf** command will now be accepted even if a router ID cannot be chosen, putting the command-line interface (CLI) into the OSPF configuration context. Therefore, the **router-id** command is to be entered before an IP address is available. If the process is not active and the **show ip ospf** command is entered, the message "%OSPF: Router process *X* is not running, please provide a router-id" will be displayed.

Link-State Advertisements and Shortest Path First

If a state change occurs as a result of the **interface enable** command, new router link-state advertisements (LSAs) will be generated (also for the old area, if the interface is changing areas) and shortest path first (SPF) will be scheduled to run in both the old and new areas.

How to Enable Area Command in Interface Mode for OSPFv2

This section contains the following procedure:

- Enabling OSPFv2 on an Interface, page 3 (required)

Enabling OSPFv2 on an Interface

Perform this task to enable OSPFv2 on an interface.

SUMMARY STEPS

1. **enable**
2. **configure terminal**

3. **interface** *type number*
4. **ip ospf** *process-id* **area** *area-id* [**secondaries none**]
5. **end**
6. **show ip ospf interface** [*interface-type interface-number*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**interface** *type number* **Example:** `Router(config)# interface FastEthernet 0/2`	Configures an interface type and enters interface configuration mode.
Step 4	**ip ospf** *process-id* **area** *area-id* [**secondaries none**] **Example:** `Router(config-if)# ip ospf 1 area 0 secondaries none`	Enables OSPFv2 on an interface. • To prevent secondary IP addresses on the interface from being advertised, you must enter the optional **secondaries** keyword followed by the **none** keyword.
Step 5	**end** **Example:** `Router(config-if)# end`	Exits interface configuration mode and returns to privileged EXEC mode.
Step 6	**show ip ospf interface** [*interface-type interface-number*] **Example:** `Router# show ip ospf interface FastEthernet 0/2`	Displays OSPF-related interface information. • Once you have enabled OSPFv2 on the interface, you can enter the **show ip ospf interface** command to verify the configuration.

Configuration Examples for Area Command in Interface Mode for OSPFv2 Feature

This section provides the following configuration example:

• Enabling OSPFv2 on an Interface: Example, page 5

Enabling OSPFv2 on an Interface: Example

In the following example, OSPFv2 is configured explicitly on Ethernet interface 0/0/0:

```
Router(config)# interface Ethernet 0/0/0
Router(config-if)# bandwidth 10000
Router(config-if)# ip address 172.16.1.1 255.255.255.0
Router(config-if)# ip ospf hello-interval 1
Router(config-if)# ip ospf 1 area 0
```

When the **show ip ospf interface** command is entered, the following output shows that Ethernet interface 0/0/0 was configured in interface configuration mode to run OSPFv2. The secondary IP addresses on the interface will also be advertised:

```
Router# show ip ospf interface Ethernet 0/0/0

Ethernet0/0/0 is up, line protocol is up
  Internet Address 172.16.1.1/24, Area 0
  Process ID 1, Router ID 172.16.11.11, Network Type BROADCAST, Cost: 10
  Enabled by interface config, including secondary ip addresses
  Transmit Delay is 1 sec, State DR, Priority 1
  Designated Router (ID) 172.16.11.11, Interface address 172.16.1.1
  Backup Designated router (ID) 172.16.22.11, Interface address 172.16.1.2
  Timer intervals configured, Hello 1, Dead 4, Wait 4, Retransmit 5
    oob-resync timeout 40
    Hello due in 00:00:00
  Supports Link-local Signaling (LLS)
  Index 2/2, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 172.26.22.11  (Backup Designated Router)
  Suppress hello for 0 neighbor(s)
```

Additional References

The following sections provide references related to the Area Command in Interface Mode for OSPFv2 feature.

Related Documents

Related Topic	Document Title
Cisco IOS commands	*Cisco IOS Master Commands List, All Releases*
OSPF commands	*Cisco IOS IP Routing: Protocol-Independent Command Reference*
OSPF configuration tasks	"Configuring OSPF" in the *Cisco IOS IP Routing Protocols Configuration Guide*

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
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	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 2328	*OSPF Version 2*

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register on Cisco.com.	http://www.cisco.com/techsupport

Command Reference

This section documents only commands that are modified.

- **ip ospf area**

ip ospf area

To enable Open Shortest Path First version 2 (OSPFv2) on an interface, use the **ip ospf area** command in interface configuration mode. To disable OSPFv2 on the interface, use the **no** form of this command.

ip ospf *process-id* **area** *area-id* [**secondaries none**]

no ip ospf *process-id* **area** [**secondaries none**]

Syntax Description

process-id	A decimal value in the range from 1 to 65535 that identifies the process ID.
area-id	A decimal value in the range from 0 to 4294967295, or an IP address.
secondaries none	(Optional) Prevents secondary IP addresses on the interface from being advertised.

Command Default

If the **secondaries none** keywords are entered in the **no** form of this command, the secondary IP addresses will be advertised. If the **secondaries none** keywords are not present, OSPFv2 will be disabled.

Command Modes

Interface configuration

Command History

Release	Modification
12.0(29)S	This command was introduced.
12.3(11)T	This command was integrated into Cisco IOS Release 12.3(11)T.
12.2(1)SB	This command was integrated into Cisco IOS Release 12.2(1)SB.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.

Usage Guidelines

OSPF is enabled on an interface when the network address for the interface matches the range of addresses that is specified by the **network area** command that is entered in router configuration mode. You can enable OSPFv2 explicitly on an interface with the **ip ospf area** command that is entered in interface configuration mode. This capability simplifies the configuration of unnumbered interfaces with different areas.

The **ip ospf area** command that is entered in interface configuration mode will supersede the effects of the **network area** command. Therefore, an interface that is configured with the **ip ospf area** command in interface configuration mode will not be affected by the **network area** command.

Note If you later disable the **ip ospf area** command, the interface will still run OSPFv2 as long as its network address matches the range of addresses that is specified by the **network area** command.

Examples

The following example enables OSPFv2 on Ethernet interface 0/0/2 and prevents secondary IP addresses from being advertised:

```
Router(config)# interface Ethernet0/0/2
Router(config-if)# ip ospf 10 area 0 secondaries none
```

Related Commands

Command	Description
interface	Configures an interface type and enters interface configuration mode.
network area	Defines the interfaces on which OSPF runs and defines the area ID for those interfaces.
show ip ospf interface	Displays OSPF-related interface information.

Feature Information for Area Command in Interface Mode for OSPFv2

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.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS and Catalyst OS software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

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 Area Command in Interface Mode for OSPFv2

Feature Name	Releases	Feature Information
Area Command in Interface Mode for OSPFv2	12.0(29)S 12.3(11)T 12.2(1)SB 12.2(33)SRB	This document describes how to enable Open Shortest Path First version 2 (OSPFv2) on a per-interface basis to simplify the configuration of unnumbered interfaces. The **ip ospf area** command allows you to enable OSPFv2 explicitly on an interface. The **ip ospf area** command is an alternative to enabling OSPFv2 through the address of the interface that matches the address range specified by the **network area** command.