Prerequisites for OSPFv3 Multiarea Adjacency

- Ensure that Open Shortest Path First version 3 (OSPFv3) is configured on the primary interface.
- Ensure that the primary interface type is point-to-point.

Restrictions for OSPFv3 Multiarea Adjacency

- A multiarea interface operates only if OSPFv3 is configured on the primary interface and the OSPFv3 network type of the primary interface is point-to-point.
- A multiarea interface exists as a logical construct over a primary interface for OSPFv3; however, the neighbor state on the primary interface is independent of the multiarea interface.
- A multiarea interface establishes a neighbor relationship with the corresponding multiarea interface on the neighboring device. A mixture of multiarea and primary interfaces is not supported.
- A multiarea interface advertises a point-to-point connection to another device in the device link-state advertisement (LSA) for the corresponding area when the neighbor state is full.
- A multiarea interface inherits all the OSPFv3 parameters (such as, authentication) from the primary interface. You cannot configure the parameters on a multiarea interface; however, you can configure the parameters on the primary interface.

Information About OSPFv3 Multiarea Adjacency

OSPFv3 Multiarea Adjacency Overview

Open Shortest Path First version 3 (OSPFv3) allows a single physical link to be shared by multiple areas. This creates an intra-area path in each of the corresponding areas sharing the same link. All areas have an interface on which you can configure OSPFv3. One of these interfaces is designated as the primary interface and others as secondary interfaces.

The OSPFv3 Multiarea Adjacency feature allows you to configure a link on the primary interface to enable optimized routing in multiple areas. Each multiarea interface is announced as a point-to-point unnumbered link. The multiarea interface exists as a logical construct over an existing primary interface. The neighbor state on the primary interface is independent of the neighbor state of the multiarea interface. The multiarea interface establishes a neighbor relationship with the corresponding multiarea interface on the neighboring device. You can only configure multiarea adjacency on an interface that has two OSPFv3 speakers.

Use the **ospfv3 multi-area** command to configure multiarea adjacency on the primary OSPFv3 interface.

How to Configure OSPFv3 Multiarea Adjacency

Configuring OSPFv3 Multiarea Adjacency

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **ipv6 enable**
5. **ospfv3 multi-area** *multi-area-id*
6. **ospfv3 multi-area** *multi-area-id* **cost** *interface-cost*
7. **ospfv3** *process-id* **ipv6 area** *area-id*
8. **serial restart-delay** *count*
9. **end**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**interface** *type number* **Example:** `Device(config)# interface serial 2/0`	Specifies the interface type and number.
Step 4	**ipv6 enable** **Example:**	Enables IPv6 processing on an interface that has not been configured with an explicit IPv6 address.

	Command or Action	Purpose
	`Device(config-if)# ipv6 enable`	
Step 5	**ospfv3 multi-area** *multi-area-id* **Example:** `Device(config-if)# ospfv3 multi-area 100`	Configures multiarea adjacency on the interface. • The *multi-area-id* argument identifies the OSPFv3 multiarea. The range is from 0 to 4294967295, or you can use an IP address.
Step 6	**ospfv3 multi-area** *multi-area-id* **cost** *interface-cost* **Example:** `Device(config-if)# ospfv3 multi-area 100 cost 512`	(Optional) Specifies the cost of sending a packet on an OSPFv3 multiarea interface. Use this command to specify the cost only if you want the cost of the multiarea interface to be different than the cost of the primary interface.
Step 7	**ospfv3** *process-id* **ipv6 area** *area-id* **Example:** `Device(config-if)# ospfv3 1 ipv6 area 0`	Configures the OSPFv3 interface. • The *process-id* argument identifies the OSPF process. The range is from 1 to 65535. • The *area-id* argument identifies the OSPF area. The range is from 0 to 4294967295, or you can use an IP address.
Step 8	**serial restart-delay** *count* **Example:** `Device(config-if)# serial restart-delay 0`	Sets the amount of time that the router waits before trying to bring up a serial interface when it goes down. The *count* argument specifies the frequency (in seconds) at which that hardware is reset. The range is from 0 to 900.
Step 9	**end** **Example:** `Device(config-if)# end`	Returns to privileged EXEC mode.

Verifying OSPFv3 Multiarea Adjacency

SUMMARY STEPS

1. **enable**
2. **show ospfv3 interface brief**
3. **show ospfv3 multi-area**
4. **show ospfv3 interface**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:**	Enables privileged EXEC mode. • Enter your password if prompted.

	Command or Action	Purpose
	`Device> enable`	
Step 2	**show ospfv3 interface brief** **Example:** `Device# show ospfv3 interface brief`	Displays brief information about Open Shortest Path First version 3 (OSPFv3) interfaces.
Step 3	**show ospfv3 multi-area** **Example:** `Device# show ospfv3 multi-area`	Displays information about OSPFv3 multiarea interfaces.
Step 4	**show ospfv3 interface** **Example:** `Device# show ospfv3 interface`	Displays information about OSPFv3 interfaces.

Configuration Examples for OSPFv3 Multiarea Adjacency

Example: OSPFv3 Multiarea Adjacency Configuration

```
Device> enable
Device# configure terminal
Device(config)# interface serial 2/0
Device(config-if)# ipv6 enable
Device(config-if)# ospfv3 multi-area 100
Device(config-if)# ospfv3 multi-area 100 cost 512
Device(config-if)# ospfv3 1 ipv6 area 0
Device(config-if)# serial restart-delay 0
Device(config-if)# end
```

Example: Verifying OSPFv3 Multiarea Adjacency

Sample Output for the show ospfv3 interface brief Command

To display brief information about Open Shortest Path First version 3 (OSPFv3) interfaces, use the **show ospfv3 interface brief** command in privileged EXEC mode.

```
Device# show ospfv3 interface brief

Interface PID Area  AF   Cost  State Nbrs F/C
Se2/0     1   0    ipv6 64    P2P   1/1
MA2 1     1   100  ipv6 512   P2P   1/1
```

Sample Output for the show ospfv3 multi-area Command

To display information about OSPFv3 multiarea interfaces, use the **show ospfv3 multi-area** command in privileged EXEC mode.

```
Device# show ospfv3 multi-area

OSPFV3_MA2 is up, line protocol is up
Primary Interface Serial2/0, Area 100
Interface ID 10
MTU is 1500 bytes
Neighbor Count is 1
```

Sample Output for the show ospfv3 interface Command

To display information about OSPFv3 interfaces, use the **show ospfv3 interface** command in privileged EXEC mode.

```
Device# show ospfv3 interface

Serial2/0 is up, line protocol is up
Link Local Address 2001:DB8:0:ABCD::1, Interface ID 10
Area 0, Process ID 1, Instance ID 0, Router ID 10.0.0.12
Network Type POINT_TO_POINT, Cost: 64
Transmit Delay is 1 sec, State POINT_TO_POINT
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
Hello due in 00:00:07
Graceful restart helper support enabled
Index 1/1/1, flood queue length 0
Next 0x0(0)/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 10.0.0.22
Suppress hello for 0 neighbor(s)
Multi-area interface Count is 1
OSPFV3_MA2 interface exists in area 100 Neighbor Count is 1
OSPFV3_MA2 is up, line protocol is up
Link Local Address 2001:DB8:0:ABCD::1, Interface ID 10
Area 100, Process ID 1, Instance ID 0, Router ID 10.0.0.12
Network Type POINT_TO_POINT, Cost: 512
Transmit Delay is 1 sec, State POINT_TO_POINT
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
Hello due in 00:00:08
Graceful restart helper support enabled
Index 1/1/2, flood queue length 0
Next 0x0(0)/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 10.0.0.22
```

Additional References for OSPFv3 Multiarea Adjacency

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Command List, All Releases
IPv6 commands	Cisco IOS IPv6 Command Reference

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. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/support

Feature Information for OSPFv3 Multiarea Adjacency

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.

Feature Name	Releases	Feature Information
OSPFv3 Multiarea Adjacency	Cisco IOS XE Release 3.11S	The OSPFv3 Multiarea Adjacency feature allows you to configure a link that multiple Open Shortest Path First version 3 (OSPFv3) areas can share to enable optimized routing. You can add more than one area to an existing OSPFv3 primary interface.

Feature Name	Releases	Feature Information
OSPFv3 Multiarea Adjacency	Cisco IOS XE Release 17.4	This feature was introduced.