OSPFv3 Configuration Commands

Table of Contents

Chapter 1 OSPFv3 Configuration Commands

1.1 OSPFv3 Configuration Commands

The OSPFv3 configuration commands include:

- area default-cost
- area nssa
- area range
- area stub
- area virtual-link
- debug ipv6 ospf
- debug ipv6 ospf events
- debug ipv6 ospf ifsm
- debug ipv6 ospf lsa
- debug ipv6 ospf nfsm
- debug ipv6 ospf nsm
- debug ipv6 ospf packet
- debug ipv6 ospf route
- default-information originate
- default-metric
- filter
- ipv6 ospf area
- ipv6 ospf cost
- ipv6 ospf database-filter all out
- ipv6 ospf dead-interval
- ipv6 ospf hello-interval
- ipv6 ospf mtu-ignore
- ipv6 ospf neighbor

- ipv6 ospf network
- ipv6 ospf priority
- ipv6 ospf retransmit-interval
- ipv6 ospf transmit-delay
- passive-interface
- redistribute
- router ospfv3
- router-id
- show ipv6 ospf
- show ipv6 ospf database
- show ipv6 ospf interface
- show ipv6 ospf neighbor
- show ipv6 ospf route
- show ipv6 ospf virtual-link
- summary-prefix
- timers delay
- timers hold

1.1.1 **area** default-cost

To specify the cost of the default summary route in the NSSA or STUB area, run the first one of the following two commands:

area *area-id* **default-cost** ***cost***

no area *area-id* **default-cost**

Parameter

Parameter	Description
area-id	Means the ID of the NSSA or STUB area.
cost	Means the cost of the default summary route.

Default value

The default value is 1.

Command mode

Routing configuration mode

Instruction

The command is helpful only when it is used on the boundary router connecting the NASSA area or the STUB area.

After the **area stub default-information-originate** command is configured, the cost configured by this command will be used in LSA to set the corresponding cost.

Example

The following example shows how to set the default cost of stub domain 36.0.0.0 to 20:

```
interface vlan 1
    ipv6 enable
    ipv6 ospf 1 area 36.0.0.0
!
router ospfv3 1
    router-id 2.2.2.2
    area 36.0.0.0 stub
    area 36.0.0.0 default-cost 20
```

Related command

area nssa

area stub

1.1.2 **area** nssa

To configure a NSSA area, run the first one of the following two commands**:**

area *area-id* **nssa** [**default-information-originate** [**metric** *value*] [**metric-type** {1 | 2}]] [**interval** *value*] [**no-redistribute**] [**no-summary**] [**range** {*ipv6-prefix/prefix-length*} [advertise | not-advertise]] [**translator** {always|candidate}]

no area *area-id* **nssa** [**default-information-originate** [**metric** *value*] [**metric-type** {1 | 2}]] [**interval** *value*] [**no-redistribute**] [**no-summary**] [**range** {*ipv6-prefix/prefix-length*} [advertise | not-advertise]] [**translator** {always|candidate}]

Parameter

Parameter	Description
area-id	Sets the ID of the NSSA area. It can be a decimal number or an IP address.

default-informatio n-originate	Means to send the default route to the NSSA area.
metric *value*	Stands for the cost of the default route, which ranges from 1 to 16777214.
metric-type {1 | 2}	Means the cost type of the default route.
interval *value*	Means the stable time of the NSSA translator role, which ranges from 1 to 65535.
no-redistribute	Means not to redistribute a route to the NSSA area.
no-summary	Forbids the ABR router to send the summary link to the NSSA area.
range	Means to conduct summary when type-7 LSA is translated into type-5 LSA.
translator	Stands for the NSSA translator role; if the parameter “always” is used, it means it is always the translator, and if it is the parameter “candidate”, it means it can be chosen as a translator.

Default value

Non-NSSA area

Command mode

Routing configuration mode

Instruction

All routers and access servers in the NSSA area will be configured by the **area nssa** command.

To decrease the number of LSA’s, you can run **no summary** on the ABR router to forbid the summary LSA to enter the NSSA area.

The parameter “no-distribute” is always used for ABR and its purpose is to stop redistributed routes from being sent to the NSSA area.

Example

The following example shows how to set the NSSA area of 36.0.0.0:

```
interface vlan 1
    ipv6 enable
    ipv6 ospf 1 area 36.0.0.0
!
router ospfv3 1
    router-id 2.2.2.2
    area 36.0.0.0 nssa
!
```

Related command

area stub

1.1.3 **area** range

To summarize the routes at the field boundary, run **area *area-id* range {*ipv6-prefix /prefix-length*} [advertise | not-advertise]**. To cancel the previous settings, run **no area range**.

area *area-id* **range {***ipv6-prefix /prefix-length***} [advertise | not-advertise]**

no area *area-id* **range {***ipv6-prefix /prefix-length***} [advertise | not-advertise]**

Parameter

Parameter	Description
area-id	Means the fields where the fields will be summarized. It can be a decimal number or an IPv6 address.
ipv6-prefix	Means the prefix of the IPv6 address.
prefix-length	Means the length of the IPv6 address' prefix.
advertise	Means that the routes are released after they are summarized.
not-advertise	Means that the routes are not released after they are summarized.

Default value

The command has no effect by default.

Command mode

Routing configuration mode

Instruction

The **area range** command is not run on the ABR router, enabling ABR to be broadcast to other routers through a summary route. In this way, the route of the field boundary is miniatured. As to the outside of the area, each address range has only one summary route.

The command can be configured on the routers in multiple areas, and OSPF, hence, can summarize many address ranges.

Example

The following example shows how to set the prefix of the summarized IPv6 address in area 1, 2001:0DB8:0:1::/64:

```
interface vlan 1
    no ip address
    ipv6 enable
    ipv6 ospf 1 area 1
!
router ospfv3 1
    router-id 192.168.255.5
    log-adjacency-changes
    area 1 range 2001:0DB8:0:1::/64
```

1.1.4 **area** stub

To configure a STUB area, run the first one of the following two commands. To cancel the configuration, run the other command.

area *area-id* **stub** [**no-summary**]

no area *area-id* **stub** [**no-summary**]

Parameter

Parameter	Description
area-id	Sets the ID of the STUB area. It can be a decimal number or an IP address.
no-summary	Forbids the ABR router to send the summary link to the STUB area.

Default value

Non-stub area

Command mode

Routing configuration mode

Instruction

All routers and access servers in the STUB area will be configured by the **area stub** command. The ABR router adopts the **default-cost** option to set the cost from the internal router to the STUB area.

To decrease the number of LSA's, you can run **no summary** on the ABR router to forbid the summary LSA to enter the STUB area.

Example

The following example shows how to set the STUB area of 36.0.0.0:

```
interface vlan 1
```

```
    ipv6 enable
    ipv6 ospf 1 area 36.0.0.0
!
router ospfv3 1
    router-id 2.2.2.2
    area 36.0.0.0 stub
!
```

Related command

area nssa

1.1.5 area virtual-link

To configure a virtual link, run the first one of the following two commands.

area *area-id* **virtual-link** *neighbor-ID* [**dead-interval** *dead-value*][**hello-interval** *hello-value*][**retransmit-interval** *retrans-value*][**transmit-delay** *dly-value*]

no area *area-id* **virtual-link** *neighbor-ID*

Parameter

Parameter	Description
area-id	Specifies the transit-area of the virtual link.
neighbor-id	OSPF router ID of the peer router of virtual link
dead-value	Stands for the interval for the local router to regard that the neighbor dies, whose unit is second. The values configured at the two terminals of the virtual link must be same.
hello-value	Stands for the interval for the router to transmit the HELLO packet on the virtual link, whose unit is second. The values configured at the two terminals of the virtual link must be same.
retrans-value	Interval for the router to transmit the **re-transmit** packet on the virtual link, whose unit is second The values configured at the two terminals of the virtual link must be same.
dly-value	Delay value which is reported by the router to LSA on the virtual link, whose unit is second The values configured at the two terminals of the virtual link must be same. The values configured at the two terminals of the virtual link must be same.

Default value

The virtual link is not configured.

The default values of other parameters are shown in the following:

Hello-value: 10s, Dead-value : 40s, Retrans-value : 5s, dly-value : 1s

Command mode

Routing configuration mode

Instruction

In order to create a virtual link, you have to perform configuration at the two terminals of the virtual link. If only one terminal need be configured, the virtual link cannot function.

The **area-id** parameter cannot be zero because the transit area of the virtual link must not be the backbone area. The area-id configured at the two terminals of the virtual link must be same.

Parameters configured at the two terminals of the virtual link must be same.

After the virtual link is created (the neighborhood is in the FULL state), the virtual link works in the Demand Circuit mode, that is, the periodical Hello packet and the LSA refresh packet are not transmitted.

You can run no **area *area-id* virtual-link *neighbor-ID*** to cancel the previous configuration of the virtual link.

You also can run **show ip ospf virtual-link** to check the state of the virtual link.

Example

The following example shows how to create a virtual link between router A and router B.

Configuration on router A (router-id: 200.200.200.1) :

```
!
interface vlan 1
    no ip address
    ipv6 enable
    ipv6 ospf 1 area 1
!
router ospfv3 1
    router-id 200.200.200.1
    area 1 virtual-link 200.200.200.2
!
```

Configuration on router B (router-id: 200.200.200.2) :

```
!
interface vlan 1
    no ip address
    ipv6 enable
    ipv6 ospf 1 area 1
```

```
!
router ospfv3 1
    router-id 200.200.200.2
    area 1 virtual-link 200.200.200.1
!
```

Related command

show ipv6 ospf virtual-link

1.1.6 **debug** ipv6 ospf

To open all debugging switches of the OSPFv3 module, run the first one of the following two commands:

debug ipv6 ospf

no debug ipv6 ospf

Parameter

None

Default value

None

Command mode

EXEC

Instruction

This command can be used to collect all debugging information about the OSPFv3 for the R&D engineers and technical support staff.

Example

```
Router# debug ipv6 ospf
LSA[Area(0.0.0.1):Type(0x2009):0.0.0.1:200.200.200.1 *]: Install Intra-Area-Prefix-LSA to Area 0.0.0.1
LSA[Area(0.0.0.1):Type(0x2009):0.0.0.1:200.200.200.1 *]: consider flooding through interface[FastEthernet0/0]
LSA[Area(0.0.0.1):Type(0x2009):0.0.0.1:200.200.200.1 *]: Intra-Area-Prefix-LSA(0x38110c0) originated
VLINK[VLINK1]: local address is 101::1VLINK[VLINK1]: peer 200.200.200.2 link upLSA[Link(FastEthernet0/0):Type(0x0008):0.0.0.4:200.200.200.1 *]: Install Link-LSA to Link FastEthernet0/0
```

LSA[Link(FastEthernet0/0):Type(0x0008):0.0.0.4:200.200.200.1 *]: consider flooding through interface[FastEthernet0/0]

LSA[Link(FastEthernet0/0):Type(0x0008):0.0.0.4:200.200.200.1 *]: Link-LSA(0x381ec40) originated

OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_EVENT.

LSA[Area(0.0.0.1):Type(0x2001):0.0.0.0:200.200.200.1 *]: Install Router-LSA to Area 0.0.0.1

LSA[Area(0.0.0.1):Type(0x2001):0.0.0.0:200.200.200.1 *]: consider flooding through interface[FastEthernet0/0]

LSA[Area(0.0.0.1):Type(0x2001):0.0.0.0:200.200.200.1 *]: Router-LSA(0x381ec20)

originated IFSM[FastEthernet0/0]: Down (InterfaceUp)

IFSM[FastEthernet0/0]: Status change Down -> Waiting

SPF[0.0.0.0]: Calculation timer scheduled [delay 5 secs]

LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.1 *]: Install Router-LSA to Area 0.0.0.0

LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.1 *]: consider flooding through interface[VLINK1]

LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.1 *]: Router-LSA(0x38297e0)

originated IFSM[VLINK1]: Down (InterfaceUp)

IFSM[VLINK1]: Status change Down -> Point-To-

Point ROUTER[1]: Change status to ABR

IFSM[FastEthernet0/0]: Hello timer expire

Packet[SEND]: src(fe80:4::2e0:fff:fe26:2d98) ->

dst(ff02::5) OSPFv3 Header

Version 3 Type 1 (Hello) Packet length 36

Router ID 200.200.200.1

Area ID 0.0.0.1

Checksum 0x0000 Instance ID 0

OSPFv3 Hello

Interface ID 4

RtrPriority 1 Options 0x000013 (-|R|-|-|E|V6)

HelloInterval 10 RtrDeadInterval 40

DRouter 0.0.0.0 BDRouter 0.0.0.0

Neighbors 0

OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_TIMER.

OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_EVENT.

OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_SOCKET.

……

1.1.7 **debug** ipv6 ospf events

To enable the event debug switch of the OSPFv3 module, run the first one of the following two commands:

debug ipv6 ospf events {abr|asbr|vlink|os|router}

no debug ipv6 ospf events { abr|asbr|vlink|os|router }

Parameter

Parameter	Description
abr	Opens the state change debug switch of ABR.
asbr	Opens the state change debug switch of ASBR.
vlink	Opens the state change debug switch of the virtual link.
os	Opens the state change debug switch of socket.
router	Opens the debug switch of OSPF.

Default value

None

Command mode

EXEC

Instruction

According to the information exported by the command, you can check the OSPF port and the neighbor trigger event.

Example

Router# **debug** ip ospf events
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_TIMER.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_TIMER.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_EVENT.
ROUTER[1]: Change status to ABR
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_EVENT.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_SOCKET.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_TIMER.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_SOCKET.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_EVENT.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_SOCKET.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_SOCKET.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_SOCKET.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_EVENT.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_SOCKET.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_SOCKET.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_EVENT.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_EVENT.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_TIMER.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_SOCKET.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_TIMER.

OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_TIMER.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_EVENT.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_SOCKET.
VLINK[VLINK1]: peer 200.200.200.2 link downROUTER[1]: Change status to non-
ABR OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_EVENT.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_TIMER.
ROUTER[Process:1]: GC timer expire
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_SOCKET.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_TIMER.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_TIMER.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_TIMER.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_TIMER.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_SOCKET.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_TIMER.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_EVENT.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_TIMER.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_TIMER.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_SOCKET.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_TIMER.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_TIMER.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_TIMER.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_TIMER.
ROUTER[Process:1]: GC timer expire
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_SOCKET.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_SOCKET.
join AllDRouters on FastEthernet0/0OSPF6D: Received ospfv3 message:
OSPFV3_MSG_RCV_EVENT. OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_EVENT.
OSPF6D: Received ospfv3 message: OSPFV3_MSG_RCV_EVENT.
……

1.1.8 **debug** ipv6 ospf ifsm

To enable the state machine's debug switch of the OSPFv3 module, run the first one of the following two commands:

debug ipv6 ospf ifsm {status|events|timers}

no debug ipv6 ospf ifsm {status|events|timers}

Parameter

Parameter	Description
status	Opens the state debug switch of the interface state machine.
events	Opens the event debug switch of the interface state machine.
timers	Opens the timer debug switch of the interface state machine.

Default value

None

Command mode

EXEC

Instruction

According to the information exported by the command, you can check the whole process of the state machine of the OSPF interface.

Example

```
Router# debug ipv6 ospf ifsm
IFSM[VLINK1]: Down (InterfaceUp)
IFSM[VLINK1]: Status change Down -> Point-To-Point
IFSM[FastEthernet0/0]: Down (InterfaceUp)
IFSM[FastEthernet0/0]: Status change Down -> Waiting
IFSM[FastEthernet0/0]: Hello timer expire
IFSM[VLINK1]: Hello timer expire
IFSM[VLINK1]: ifsm_ignore called
IFSM[VLINK1]: Point-To-Point (NeighborChange)
IFSM[FastEthernet0/0]: ifsm_ignore called
IFSM[FastEthernet0/0]: Waiting (NeighborChange)
IFSM[VLINK1]: LS ack timer expire
IFSM[VLINK1]: LS ack timer expire
IFSM[VLINK1]: Point-To-Point (InterfaceDown)
IFSM[VLINK1]: Status change Point-To-Point -> Down
IFSM[VLINK1]: ifsm_ignore called
IFSM[VLINK1]: Down (NeighborChange)
IFSM[FastEthernet0/0]: Hello timer expire
IFSM[FastEthernet0/0]: Hello timer expire
IFSM[FastEthernet0/0]: Hello timer expire
IFSM[FastEthernet0/0]: Wait timer expire
IFSM[FastEthernet0/0]: DR-Election[1st]: Backup 200.200.200.2
IFSM[FastEthernet0/0]: DR-Election[1st]: DR         200.200.200.2
IFSM[FastEthernet0/0]: Waiting (WaitTimer)
IFSM[FastEthernet0/0]: Status change Waiting -> DROther
IFSM[VLINK1]: Down (InterfaceUp)
IFSM[VLINK1]: Status change Down -> Point-To-Point
IFSM[FastEthernet0/0]: DR-Election[1st]: Backup 200.200.200.1
IFSM[FastEthernet0/0]: DR-Election[1st]: DR         200.200.200.2
IFSM[FastEthernet0/0]: DR-Election[2nd]: Backup 200.200.200.1
IFSM[FastEthernet0/0]: DR-Election[2nd]: DR         200.200.200.2
```

IFSM[FastEthernet0/0]: DROther (NeighborChange)
IFSM[FastEthernet0/0]: Status change DROther -> Backup
IFSM[FastEthernet0/0]: Hello timer expire
IFSM[FastEthernet0/0]: LS ack timer expire
IFSM[VLINK1]: Hello timer expire
IFSM[FastEthernet0/0]: LS ack timer expire
IFSM[VLINK1]: Point-To-Point (InterfaceDown)
IFSM[VLINK1]: Status change Point-To-Point -> Down
IFSM[VLINK1]: Down (InterfaceUp)
IFSM[VLINK1]: Status change Down -> Point-To-Point
IFSM[FastEthernet0/0]: LS ack timer expire
IFSM[VLINK1]: Hello timer expire
……

1.1.9 **debug** ipv6 ospf lsa

To enable the LSA-related debug switch of the OSPFv3 module, run the first one of the following two commands:

debug ipv6 ospf lsa { flooding|install|maxage|refresh}

no debug ipv6 ospf lsa { flooding|install|maxage|refresh}

Parameter

Parameter	Description
flooding	Opens the debug switch of LSA exchange.
install	Opens the debug switch of LSA installation.
maxage	Opens the debug switch of LSA timeout.
refresh	Opens the debug switch of LSA-Refresh.

Default value

None

Command mode

EXEC

Instruction

According to the information exported by the command, you can browse the operation that OSPF performs to LSA and related events.

Example

router# debug ipv6 ospf lsa

LSA[Area(0.0.0.1):Type(0x2009):0.0.0.1:200.200.200.1 *]: Install Intra-Area-Prefix-LSA to Area 0.0.0.1

LSA[Area(0.0.0.1):Type(0x2009):0.0.0.1:200.200.200.1 *]: consider flooding through interface[FastEthernet0/0]

LSA[Area(0.0.0.1):Type(0x2009):0.0.0.1:200.200.200.1 *]: Intra-Area-Prefix-LSA(0x3824ba0) originated

LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.1 *]: Install Router-LSA to Area 0.0.0.0

LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.1 *]: consider flooding through interface[VLINK1]

LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.1 *]: consider flooding to neighbor[200.200.200.2]

LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.1 *]: Router-LSA(0x3819be0) originated

LSA[Link(FastEthernet0/0):Type(0x0008):0.0.0.4:200.200.200.1 *]: Install Link-LSA to Link FastEthernet0/0

LSA[Link(FastEthernet0/0):Type(0x0008):0.0.0.4:200.200.200.1 *]: consider flooding through interface[FastEthernet0/0]

LSA[Link(FastEthernet0/0):Type(0x0008):0.0.0.4:200.200.200.1 *]: Link-LSA(0x3819bc0) originated

LSA[Area(0.0.0.1):Type(0x2001):0.0.0.0:200.200.200.1 *]: Install Router-LSA to Area 0.0.0.1

LSA[Area(0.0.0.1):Type(0x2001):0.0.0.0:200.200.200.1 *]: consider flooding through interface[FastEthernet0/0]

LSA[Area(0.0.0.1):Type(0x2001):0.0.0.0:200.200.200.1 *]: Router-LSA(0x3824740) originated

LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.2]: instance(0x380bf60) created with Link State Update

LSA[Area(0.0.0.0):Type(0x2003):0.0.0.1:200.200.200.2]: instance(0x38246c0) created with Link State Update

LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.2]: flood started

LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.2]: consider flooding through interface[VLINK1]

LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.2]: consider flooding to neighbor[200.200.200.2]

LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.2]: neighbor is not Full state

LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.2]: Install Router-LSA to Area

0.0.0.0 LSA[Area(0.0.0.0):Type(0x2003):0.0.0.1:200.200.200.2]: flood started

LSA[Area(0.0.0.0):Type(0x2003):0.0.0.1:200.200.200.2]: consider flooding through interface[VLINK1]

LSA[Area(0.0.0.0):Type(0x2003):0.0.0.1:200.200.200.2]: consider flooding to neighbor[200.200.200.2]

LSA[Area(0.0.0.0):Type(0x2003):0.0.0.1:200.200.200.2]: neighbor is not Full state

LSA[Area(0.0.0.0):Type(0x2003):0.0.0.1:200.200.200.2]: Install Inter-Area-Prefix-LSA to Area 0.0.0.0

LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.1 *]: Install Router-LSA to Area 0.0.0.0

LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.1 *]: consider flooding through interface[VLINK1]

LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.1 *]: consider flooding to neighbor[200.200.200.2]

LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.1 *]: added to neighbor[200.200.200.2]'s retransmit-list

LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.1 *]: sending update to interface[VLINK1]

LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.1 *]: Router-LSA
refreshed OSPFv3 LSA Header
LS age 0
LS type 0x2001 (Router-LSA)
Advertising Router 200.200.200.1
Link State ID 0.0.0.0
LS sequence number 0x80000002
LS checksum 0x5ff7
length 40
LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.1 *]: consider flooding through interface[VLINK1]
LSA[Area(0.0.0.1):Type(0x2001):0.0.0.0:200.200.200.1 *]: Install Router-LSA to Area 0.0.0.1
LSA[Area(0.0.0.1):Type(0x2001):0.0.0.0:200.200.200.1 *]: consider flooding through interface[FastEthernet0/0]
LSA[Area(0.0.0.1):Type(0x2001):0.0.0.0:200.200.200.1 *]: Router-LSA
refreshed OSPFv3 LSA Header
LS age 0
LS type 0x2001 (Router-LSA)
Advertising Router 200.200.200.1
Link State ID 0.0.0.0
LS sequence number 0x80000002
LS checksum 0x5382
length 24
LSA[Area(0.0.0.1):Type(0x2009):0.0.0.1:200.200.200.1 *]: Install Intra-Area-Prefix-LSA to Area 0.0.0.1
LSA[Area(0.0.0.1):Type(0x2009):0.0.0.1:200.200.200.1 *]: consider flooding through interface[FastEthernet0/0]
LSA[Area(0.0.0.1):Type(0x2009):0.0.0.1:200.200.200.1 *]: Intra-Area-Prefix-LSA
refreshed OSPFv3 LSA Header
LS age 0
LS type 0x2009 (Intra-Area-Prefix-
LSA) Advertising Router 200.200.200.1
Link State ID 0.0.0.1
LS sequence number 0x80000002
LS checksum 0x3631
length 64
……

1.1.10 **debug** ipv6 ospf nfsm

To enable the state machine's debug switch of the OSPFv3 neighbor, run the first one of the following two commands:

debug ipv6 ospf nfsm {status|events|timers}

no debug ipv6 ospf nfsm {status|events|timers}

Parameter

Parameter	Description
status	Opens the state debug switch of the neighbor state machine.
events	Opens the event debug switch of the neighbor state machine.
timers	Opens the timer debug switch of the neighbor state machine.

Default value

None

Command mode

EXEC

Instruction

According to the information exported by the command, you can check the whole process of the OSPF neighbor's state machine.

Example

router# debug ipv6 ospf nfsm NFSM[200.200.200.2-
00000004]: Full (HelloReceived)
NFSM[200.200.200.2-00000004]: nfsm_ignore calledNFSM[200.200.200.2-00000004]: Full (2-WayReceived)
NFSM[200.200.200.2-00000004]: Down (HelloReceived)
NFSM[200.200.200.2-00000004]: Status change Down -> Init
NFSM[200.200.200.2-00000004]: nfsm_ignore called
NFSM[200.200.200.2-00000004]: Init (1-WayReceived)
NFSM[200.200.200.2-00000004]: Init (HelloReceived)
NFSM[200.200.200.2-00000004]: Init (2-WayReceived)
NFSM[200.200.200.2-00000004]: Status change Init -> 2-Way
NFSM[200.200.200.2-00000004]: 2-Way (HelloReceived)
NFSM[200.200.200.2-00000004]: nfsm_ignore called
NFSM[200.200.200.2-00000004]: 2-Way (2-WayReceived)
NFSM[200.200.200.2-00000004]: 2-Way (AdjOK?) NFSM[200.200.200.2-
00000004]: Status change 2-Way -> ExStar tNFSM[200.200.200.2-
00000004]: ExStart (HelloReceived) NFSM[200.200.200.2-00000004]:
nfsm_ignore called NFSM[200.200.200.2-00000004]: ExStart (2-
WayReceived) NFSM[200.200.200.2-00000004]: DD Retransmit timer
expire NFSM[200.200.200.2-00000004]: ExStart (NegotiationDone)
NFSM[200.200.200.2-00000004]: Status change ExStart -> Exchange
NFSM[200.200.200.2-00000004]: Exchange (ExchangeDone)
NFSM[200.200.200.2-00000004]: Status change Exchange -> Loading

NFSM[200.200.200.2-00000004]: nfsm_ignore called
NFSM[200.200.200.2-00000004]: Loading (LoadingDone)
NFSM[200.200.200.2-00000004]: Status change Loading -> Full
NFSM[200.200.200.2-80000001]: Down (HelloReceived)
NFSM[200.200.200.2-80000001]: Status change Down -> Init
NFSM[200.200.200.2-80000001]: Init (2-WayReceived)
NFSM[200.200.200.2-80000001]: Status change Init -> ExStart
NFSM[200.200.200.2-80000001]: ExStart (NegotiationDone)
NFSM[200.200.200.2-80000001]: Status change ExStart -> Exchange
NFSM[200.200.200.2-80000001]: Exchange (ExchangeDone)
NFSM[200.200.200.2-80000001]: Status change Exchange -> Loading
NFSM[200.200.200.2-80000001]: nfsm_ignore called
NFSM[200.200.200.2-80000001]: Loading (LoadingDone)
NFSM[200.200.200.2-80000001]: Status change Loading -> Full
NFSM[200.200.200.2-00000004]: Full (HelloReceived)
NFSM[200.200.200.2-00000004]: nfsm_ignore called
NFSM[200.200.200.2-00000004]: Full (2-WayReceived)
NFSM[200.200.200.2-00000004]: Full (AdjOK?)
NFSM[200.200.200.2-00000004]: LS update timer expire
NFSM[200.200.200.2-80000001]: LS update timer expire
NFSM[200.200.200.2-00000004]: LS update timer expire
NFSM[200.200.200.2-80000001]: LS update timer expire
NFSM[200.200.200.2-80000001]: Full (HelloReceived)
NFSM[200.200.200.2-80000001]: nfsm_ignore called
NFSM[200.200.200.2-80000001]: Full (2-WayReceived)
NFSM[200.200.200.2-00000004]: Full (HelloReceived)
NFSM[200.200.200.2-00000004]: nfsm_ignore called
NFSM[200.200.200.2-00000004]: Full (2-WayReceived)
NFSM[200.200.200.2-00000004]: LS update timer expire
NFSM[200.200.200.2-80000001]: LS update timer expire
……

1.1.11 **debug** ipv6 ospf nsm

To open the debug switch of information transmission between the IPv6 routing table's management module and the OSPFv3 module, run the first one of the following two commands:

debug ipv6 ospf nsm { redistribute | interface }

no debug ipv6 ospf nsm { redistribute | interface }

Parameter

Parameter	Description
redistribute	Opens the debug switch of routing information forwarding.
interface	Opens the debug switch of interface events.

Default value

None

Command mode

EXEC

Instruction

According to the information exported by this command, you can browse information exchange between OSPF and routing management module.

Example

```
router# debug ipv6 ospf nsm
Sep 17 16:43:53 OSPFv3: Received [NSM_MSG_ROUTE_CHG_NOTIFY:NSM_REDISTRIBUTE_DEL] message
Sep 17 16:43:53 OSPFv3: Received [NSM_MSG_ROUTE_CHG_NOTIFY:NSM_REDISTRIBUTE_DEL] message
Sep 17 16:43:53 OSPFv3: Received [NSM_MSG_ROUTE_CHG_NOTIFY:NSM_REDISTRIBUTE_DEL] message
Sep 17 16:43:53 OSPFv3: Received [NSM_MSG_ROUTE_CHG_NOTIFY:NSM_REDISTRIBUTE_DEL] message
Sep 17 16:43:53 OSPFv3: Receive [NSM_MSG_GLBL_ENAIPV6] message
……
```

1.1.12 **debug** ipv6 ospf packet

To enable the debug switch of OSPFv3 transmission and reception, run the first one of the following two commands:

debug ipv6 ospf packet { hello|dd|ls-request|ls-update|ls-ack }

no debug ipv6 ospf packet { hello|dd|ls-request|ls-update|ls-ack }

Parameter

Parameter	Description
hello	Opens the debug switch of Hello packets.
dd	Opens the debug switch of DD packets.
ls-request	Opens the debug switch of IS-REQUEST packets.
ls-update	Opens the debug switch of IS-Update packets.
ls-ack	Opens the debug switch of IS-Ack packets.
detail	Observes the details of packets.

Default value

None

Command mode

EXEC

Instruction

According to the information exported by the command, you can check the exchange of the OSPF packets.

Example

```
router# debug ipv6 ospf packet
Packet[SEND]: src(fe80:4::2e0:fff:fe26:2d98) -> dst(ff02::5)
OSPFv3 Header
  Version 3   Type 1 (Hello)   Packet length 40
  Router ID 200.200.200.1
  Area ID 0.0.0.1
  Checksum 0x0000   Instance ID 0
OSPFv3 Hello
  Interface ID 4
  RtrPriority 1   Options 0x000013 (-|R|-|-|E|V6)
  HelloInterval 10   RtrDeadInterval 40
  DRouter 200.200.200.2   BDRouter 200.200.200.1
  # Neighbors 1
    Neighbor 200.200.200.2
Packet[RECV]: src(101::2) -> dst(101::1)
OSPFv3 Header
  Version 3 Type 1 (Hello) Packet length 40
  Router ID 200.200.200.2
  Area ID 0.0.0.0
  Checksum 0x5774 Instance ID 0
OSPFv3 Hello
  Interface ID 2147483649
  RtrPriority 1   Options 0x000013 (-|R|-|-|E|V6)
  HelloInterval 10   RtrDeadInterval 40
  DRouter 0.0.0.0   BDRouter 0.0.0.0
  # Neighbors 1
    Neighbor 200.200.200.1
RECV[Hello]: Neighbor(200.200.200.2) declare 0.0.0.0 as DR, 0.0.0.0 as
Backup Packet[SEND]: src(101::1) -> dst(101::2)
OSPFv3 Header
  Version 3   Type 1 (Hello)   Packet length 40
```

```
  Router ID 200.200.200.1
  Area ID 0.0.0.0
  Checksum 0x0000  Instance ID 0
OSPFv3 Hello
  Interface ID 2147483649
  RtrPriority 1  Options 0x000013 (-|R|-|-|E|V6)
  HelloInterval 10  RtrDeadInterval 40
  DRouter 0.0.0.0  BDRouter 0.0.0.0
  # Neighbors 1
    Neighbor 200.200.200.2
Packet[RECV]: src(fe80::2e0:fff:fe26:a8) -> dst(ff02::5)
OSPFv3 Header
  Version 3  Type 1 (Hello)  Packet length 40
  Router ID 200.200.200.2
  Area ID 0.0.0.1
  Checksum 0xa8a8  Instance ID 0
OSPFv3 Hello
  Interface ID 4
  RtrPriority 1  Options 0x000013 (-|R|-|-|E|V6)
  HelloInterval 10  RtrDeadInterval 40
  DRouter 200.200.200.2  BDRouter 200.200.200.1
  # Neighbors 1
    Neighbor 200.200.200.1
RECV[Hello]: Neighbor(200.200.200.2) declare 200.200.200.2 as DR, 200.200.200.1 as
Backup Packet[SEND]: src(fe80:4::2e0:fff:fe26:2d98) -> dst(ff02::5)
OSPFv3 Header
  Version 3 Type 1 (Hello) Packet length 40
  Router ID 200.200.200.1
  Area ID 0.0.0.1
  Checksum 0x0000 Instance ID 0
OSPFv3 Hello
  Interface ID 4
  RtrPriority 1 Options 0x000013 (-|R|-|-|E|V6)
  HelloInterval 10 RtrDeadInterval 40
  DRouter 200.200.200.2  BDRouter 200.200.200.1
  # Neighbors 1
    Neighbor 200.200.200.2
    ……
```

1.1.13 **debug** ipv6 ospf route

To enable the debug switch of OSPFv3 routing information, run the first one of the following two commands:

debug ipv6 ospf route { ase|install|spf|ia }

no debug ipv6 ospf route { ase|install|spf|ia }

Parameter

Parameter	Description
ase	Opens the debug switch of exterior routing calculation.
install	Opens the debug switch of routing installation procedure.
spf	Opens the debug switch of SPF calculation.
ia	Opens the debug switch of between-domain routing calculation.

Default value

None

Command mode

EXEC

Instruction

According to the information exported by the command, you can browse the calculation, deletion and addition of OSPF routes.

Example

router# debug ipv6 ospf route

Route[IA:0.0.0.0]: No SPF tree, schedule SPF calculationSPF[0.0.0.1]: SPF calculation timer expire

SPF[0.0.0.1]: SPF calculation (1st STAGE)

SPF[0.0.0.1]: Vertex[200.200.200.1-0.0.0.0]

SPF[0.0.0.1]: SPF calculation (2nd STAGE)

SPF[0.0.0.1]: SPF calculation (END)

Route[IA:0.0.0.1]: Cleanup IA route because of no ABRsRoute[IA:0.0.0.1]: Cleanup IA route because of no ABRsSPF[0.0.0.1]: Calculation completed [0.170000 sec]

SPF[0.0.0.1]: Calculation timer scheduled [delay 9

secs] SPF[0.0.0.1]: SPF calculation timer expire

SPF[0.0.0.1]: SPF calculation (1st STAGE)

SPF[0.0.0.1]: Vertex[200.200.200.1-0.0.0.0]

SPF[0.0.0.1]: SPF calculation (2nd STAGE)

SPF[0.0.0.1]: SPF calculation (END)

Route[IA:0.0.0.1]: Cleanup IA route because of no ABRsSPF[0.0.0.1]: Calculation completed [0.180000 sec]

SPF[0.0.0.1]: Calculation timer scheduled [delay 10 secs]

SPF[0.0.0.0]: Calculation timer scheduled [delay 5 secs]

Route[IA:0.0.0.1]: 888::/64 calculating Network routeRoute[IA:0.0.0.1]: 888::/64 Can't find route to ABR (200.200.200.2)Route[IA:0.0.0.0]: No SPF tree, schedule SPF calculationSPF[0.0.0.0]: SPF calculation timer expire

SPF[0.0.0.0]: SPF calculation (1st STAGE)

SPF[0.0.0.0]: Vertex[200.200.200.1-0.0.0.0]

SPF[0.0.0.0]: Link[0] (200.200.200.2-128.0.0.1): Virtual-Link

SPF[0.0.0.0]: Calculate nexthop for (200.200.200.2-0.0.0.0)

Route[0.0.0.0:SPF]: ADD Stub Route for (200.200.200.2)SPF[0.0.0.0]: Vertex[200.200.200.2-0.0.0.0]

SPF[0.0.0.0]: Link[0] (200.200.200.1-128.0.0.1): Virtual-Link

SPF[0.0.0.0]: LSA[Area(0.0.0.0):Type(0x2001):0.0.0.0:200.200.200.1 *] is already in SPF tree

SPF[0.0.0.0]: SPF calculation (2nd STAGE)

SPF[0.0.0.0]: SPF calculation (END)

SPF[0.0.0.0]: Calculation completed [0.580000 sec]

……

1.1.14 **default-information** originate

To introduce the default route to the OSPFv3 routing domain, run the following command:

default-information originate [always | metric *value* **| metric-type** {1 | 2} **| tag** *tag***] no default-information originate**

Parameter

Parameter	Description
Always	Generates and releases an ASE-LSA, which describes the default route, or just releases it out if the default route exists in the routing table.
metric *value*	Stands for the cost of the default route, which ranges from 1 to 16777214.
metric-type	Means the cost type of the default route.
tag *tag*	Means the routing identifier, which ranges from 0 to 4294967295.

Default value

No default route is introduced.

Command mode

Routing configuration mode

Instruction

The redistribute command cannot introduce the default route, and if you want to introduce the default route, you can use this command.

If the **always** parameter is set, no matter whether the default route exists in the current routing table, ASE-LSA, describing the default route, will be released out; if the **always** parameter is not set, ASE-LSA will be released out only when the default route exists in the current routing table.

Example

The following example shows how to introduce the default route from the OSPFv3 autonomous system.

```
router ospfv3 1
  router-id 2.2.2.2
  default-information originate always
```

Related command

redistribute

1.1.15 default-metric

To set the default weight of the introduced route, run the first one of the following two commands:

default-metric *value*

no default-metric

Parameter

Parameter	Description
value	Stands for the to-be-set route weight, ranging between 1 and 16777214.

Default value

The default route weight is 10.

Command mode

Routing configuration mode

Instruction

The **default-metric** command is used to set the default routing weight when the route of other routing protocol is guided into the OSPF packet. When the **redistribute** command is used to guide the route of other routing protocol, the default routing weight designated by the **default-metric** command will be guided the specific routing weight will not be specified.

Example

The following example shows how to introduce the static route and set the default route weight of other routing protocol to 3:

```
interface vlan 1
  ipv6 enable
```

```
    ipv6 ospf 1 area 36.0.0.0
!
router ospfv3 1
    router-id 2.2.2.2
    default-metric 3
    redistribute static
```

Related command

redistribute

1.1.16 filter

To set the routing filtration table, run **filter {*interface-type interface-number* | *} {in | out } {access-list *access-list-name* | gateway *access-list-name* | prefix-list *prefix-list-name*}**. To resume the default settings, run **no filter {interface-type interface-number | *} {in | out } {access-list access-list-name | gateway access-list-name | prefix-list prefix-list-name}**.

filter {**interface-type** *interface*-number | ***}** {**in | out** } {**access-list** *access-list-name* | **gateway** *access-list-name* | **prefix-list** *prefix-list-name*}

no filter {**interface-type** *interface*-number | ***}** {**in** | out} {**access-list** *access-list-name* | **gateway** *access-list-name* | **prefix-list** *prefix-list-name*}

Parameter

***interface*-type**	Interface type
interface-number	Interface number
*****	All interfaces
In	Filtrates the received OSPF routes.
out	Filters the transmitted routes, which is not for a specific interface but for all interfaces.
access-list-name	Name of the IP access control list
access-list-name	Name of the IP access control list
prefix-list-name	Name of the prefix list

Default value

None

Command mode

Routing configuration mode

Example

The following example shows how to filter the received routes according to the **mylist** ACL.

```
router ospfv3 1
    filter * in access-list mylist
```

Related command

None

1.1.17 **ipv6** ospf area

To enable the OSPFv3 protocol on an interface and specify an area for this interface, run the first one of the following two commands:

ipv6 ospf *process-id* **area** *area-id* [**instance** *instance-id*]

no ipv6 ospf *process-id* **area** *area-id* [**instance** *instance-id*]

Parameter

Parameter	Description
process-id	Stands for the OSPF process.
area-id	Stands for the OSPF area ID, which is specified by the interface.
instance-id	Specifies the OSPF instance ID of the interface, whose default value is 0.

Default value

None

Command mode

Interface configuration mode

Example

The following example shows how to enable OSPFv3 process 1 for interface vlan1 and set its area ID to 0.

```
interface vlan 1
    ipv6 enable
    ipv6 ospf 1 area 0
!
router ospfv3 1
    router-id 2.2.2.2
```

Related command

None

1.1.18 **ipv6** ospf cost

To designate the cost for the OSPFv3 protocol running on the interface, run **ipv6 ospf cost *cost***. To resume the default settings, run **no ipv6 ospf cost**.

ipv6 ospf cost *cost* [**instance** *instance-id*]

no ipv6 ospf *cost* *cost* [**instance** *instance-id*]

Parameter

Parameter	Description
cost	Cost for the OSPF protocol, which is an integer between 1 and 65535
instance-id	Specifies the OSPF instance ID of the interface, whose default value is 0.

Default value

The default cost for the OSPFv3 protocol running on the interface is obtained based on the rate of the port.

Command mode

Interface configuration mode

Example

The following example shows how to set the cost for the OSPFv3 protocol running on interface vlan1 to 2:

```
interface vlan 1
  ipv6 ospf cost 2
```

Related command

None

1.1.19 **ipv6** ospf database-filter all out

To designate an interface to filter those to-be-transmitted LSA, run the first one of the following two commands:

ipv6 ospf database-filter all out [**instance** *instance-id*]

no ipv6 ospf database-filter all out [**instance** *instance-id*]

Parameter

Parameter	Description
instance-id	Specifies the OSPF instance ID of the interface, whose default value is 0.

Default value

The interface does not filter those to-be-transmitted LSAs.

Command mode

Interface configuration mode

Example

The following example shows how to set interface vlan 1 to filter those to-be-transmitted LSAs:

```
interface vlan 1
  ipv6 ospf database-filter all out
```

Related command

None

1.1.20 **ipv6** ospf dead-interval

To designate the dead interval of the neighboring router, run **ipv6 ospf dead-interval *seconds***. To resume the default value, run **ipv6 ospf dead-interval**.

ipv6 ospf dead-interval *seconds* [**instance** *instance-id*]

ipv6 ospf dead-interval *seconds* [**instance** *instance-id*]

Parameter

Parameter	Description
seconds	Value of the dead interval for the neighboring router, which ranges from 1 to 2147483647 seconds
instance-id	Specifies the OSPF instance ID of the interface, whose default value is 0.

Default value

The dead interval for the neighboring router is four times of hello-interval by default.

Command mode

Interface configuration mode

Instruction

The value of the **dead-interval** parameter will be written to the HELLO packet and will be transmitted along with the HELLO packet. It must be ensured that the **dead-interval** parameter must be identical with that between the neighboring routers and the value of the **dead-interval** parameter must be four times of the value of the **hello-interval** parameter.

Example

The following example shows how to set the dead interval of the neighboring router on interface vlan1 to 60 seconds.

```
interface vlan 1
  ipv6 ospf dead-interval 60
```

Related command

None

1.1.21 **ipv6** ospf hello-interval

To designate the interval for transmitting the HELLO packet on the interface, run **ipv6 ospf hello-interval *seconds***. To resume the default settings, run **no ipv6 ospf hello-interval**.

ipv6 ospf hello-interval *seconds* [**instance** *instance-id*]

no ipv6 ospf hello-interval *seconds* [**instance** *instance-id*]

Parameter

Parameter	Description
seconds	Transmission interval of the HELLO packet, ranging from 1 to 65535 seconds
instance-id	Specifies the OSPF instance ID of the interface, whose default value is 0.

Default value

The interval for the P2P or Broadcast interface to send Hello packets is 10 seconds, while the interval for the P2MP or NBMA interface to send Hello packets is 30 seconds.

Command mode

Interface configuration mode

Instruction

The value of the **dead-interval** parameter will be written to the HELLO packet and will be transmitted along with the HELLO packet. The smaller the hello-interval is, the sooner the change of the network topology will be found. However, much more path cost will be paid. It must be ensured that the parameter must be identical with that between the neighboring routers.

Example

The following example shows that the interval for transmitting the HELLO packet on interface vlan1 is set to 20 seconds.

```
interface vlan 1
  ipv6 ospf hello-interval 20
```

Related command

ipv6 ospf dead-interval

1.1.22 **ipv6** ospf mtu-ignore

To set the MTU value of the transmitted DD packet to 0 on an interface and meanwhile omit the checkup of the MTU domain of the received DD packet, run the first one of the following two commands:

ipv6 ospf mtu-ignore [**instance** *instance-id*]

no ipv6 ospf mtu-ignore [**instance** *instance-id*]

Parameter

Parameter	Description
instance-id	Specifies the OSPF instance ID of the interface, whose default value is 0.

Default value

The value of the MTU domain of the DD packet is set to be the MTU value of this interface and MTU checkup is not omitted.

Command mode

Interface configuration mode

Instruction

OSPF judges whether the MTU value of the network segment, where an interface belongs, is consistent by checking the MTU value of the exchanged DD packet.If the MTU value of the received DD packet is bigger than the MTU value of this interface, the OSPF neighborhood cannot be set up.

Example

The following example shows how to set interface vlan1 to omit MTU checkup.

```
interface vlan 1
  ipv6 ospf mtu-ignore
```

Related command

None

1.1.23 **ipv6** ospf neighbor

To set the OSPF neighbor on the non-broadcast network interface, run the first one of the following two commands:

ipv6 ospf neighbor *router-id* *ipv6-address* [**cost** *number*] [**database-filter all out**] [**poll-interval** *seconds*] [**priority** *number*] [**instance** *instance-id*]

no ipv6 ospf neighbor *router-id* *ipv6-address* [**cost** *number*] [**database-filter all out**] [**poll-interval** *seconds*] [**priority** *number*] [**instance** *instance-id*]

Parameter

Parameter	Description
router-id	Means the router ID of a neighbor.
ipv6-address	Means the local address of the neighbor's link.
cost *number*	Means the neighbor’s cost, whose value ranges from 1 to 65535.
database-filter all out	Filters the transmitted LSAs.
poll-interval *seconds*	Means the query interval of a neighbor.
priority *number*	Means the neighbor’s priority, whose value ranges from 0 to 255.
instance *instance-id*	Specifies the OSPF instance ID of the interface, whose default value is 0.

Default value

No neighbors are set.

Command mode

Interface configuration mode

Instruction

You shall specify a neighbor manually on the non-broadcast network. If neighbors invalidates, the Hello packet should be sent to this neighbor in poll interval.

Example

The following example shows how to set the neighbor of interface vlan1.

```
interface vlan 1
  ipv6 ospf neighbor 1.1.1.1 fe80::1
```

Related command

None

1.1.24 **ipv6** ospf network

To set the network type for the interface, run the first one of the following two commands.

ipv6 ospf network { **broadcast | non-broadcast | point_to_multipoint** | **point-to-point**} [**instance** *instance-id*]

no ip ospf network { **broadcast | nonbroadcast | point_to_multipoint | point-to-point**} [**instance** *instance-id*]

Parameter

Parameter	Description
broadcast	Sets the network type of the interface to **broadcast**.
nonbroadcast	Sets the network type of the interface to **NBMA**.
point-to-multipoint	Sets the network type of the interface to **point-to-multipoint**.
point-to-point	Sets the network type of the interface to **point-to-point**.
instance *instance-id*	Specifies the OSPF instance ID of the interface, whose default value is 0.

Command mode

Interface configuration mode

Instruction

The interface in the broadcast network without multi-address access should be set to NBMA. In the NBMA network, the network should be set to **point-to-multipoint** if any two routers cannot be ensured to be directly reachable.

Example

The following example shows how to set interface vlan1 to NBMA.

```
interface vlan 1
  ipv6 ospf network non-broadcast
```

Related command

None

1.1.25 **ipv6** ospf priority

To configure the priority for the interface to choose the router, run **ipv6 ospf priority *priority*.** To resume the default value, run **no ipv6 ospf priority**.

ipv6 ospf priority *priority* [**instance** *instance-id*]

no ipv6 ospf priority [**instance** *instance-id*]

Parameter

Parameter	Description
priority	Priority to choose the router, ranging between 0 and 255
instance-id	Specifies the OSPF instance ID of the interface, whose default value is 0.

Default value

The default priority for the interface to choose the routers is 1.

Command mode

Interface configuration mode

Instruction

When two routers in the same network segment want to be the selection router, the router with higher priority will be selected. If the priority of the two routers is the same, the router with a larger ID is selected. When the priority of a router is 0, the router cannot be selected as the designated router or the standby designated router. The priority is effective only on the networks except the nonpoint-to-point network.

Example

The following example shows how to set the priority to 8 when interface vlan1 selects the selection router.

```
interface vlan 1
  ipv6 ospf priority 8
```

Related command

None

1.1.26 **ipv6** ospf retransmit-interval

To designate the retransmission interval for transmitting LSA between the interface and the neighboring router, run **ipv6 ospf retransmit-interval seconds**. To resume the default value, run **no ipv6 ospf retransmit-interval**.

ipv6 ospf retransmit-interval *seconds* [**instance** *instance-id*]

no ipv6 ospf retransmit-interval *seconds* [**instance** *instance-id*]

Parameter

Parameter	Description
seconds	Transmission interval for transmitting the link state broadcast between the interface and the neighboring router, ranging between 1 and 3600 seconds
instance-id	Specifies the OSPF instance ID of the interface, whose default value is 0.

Default value

The default interval for transmitting the link state broadcast between the interface and the neighboring router is 5 seconds.

Command mode

Interface configuration mode

Instruction

When a router transmits the link-state broadcast to its neighbor, the command will maintain the link-state broadcast until the peer receives the acknowledgement. If the link-state broadcast is not received during the transmission interval, it will be retransmitted. The value of the **seconds** parameter must be larger than the round-trip time for a packet transmitting between two routers.

Example

The following example shows how the default interval for transmitting the link-state broadcast between interface vlan1 and the neighboring router is set to 8 seconds.

```
interface vlan 1
  ipv6 ospf retransmit-interval 8
```

Related command

None

1.1.27 **ipv6** ospf transmit-delay

To set the delay for the link-state broadcast to be transmitted on the interface, run **ipv6 ospf transit-delay time**. To resume the default value, run **no ipv6 ospf transit-delay**.

ipv6 ospf transit-delay *time* [**instance** *instance-id*]

no ipv6 ospf transit-delay *time* [**instance** *instance-id*]

Parameter

Parameter	Description
time	Means the delay of link state broadcast transmission on an interface, which ranges from 1 to 3600 seconds.
instance-id	Specifies the OSPF instance ID of the interface, whose default value is 0.

Default value

The default delay for the link-state broadcast to be transmitted on the interface is 1 second.

Command mode

Interface configuration mode

Example

The following example shows how to set the delay for transmitting the link-state broadcast on interface vlan1 to 3 seconds.

```
interface vlan 1
  Ipv6 ospf transit-delay 3
```

Related command

None

1.1.28 passive-interface

To forbid a designated interface to transmit or receive the OSPFv3 packets, run the first one of the following two commands:

passive-interface { *interface-type* *interface-number* | all }

no passive -interface { *interface-type* *interface-number* | all }

Parameter

Parameter	Description
interface-type *interface-number*	Means the interface type and the interface ID.
all	Means all interfaces.

Default value

The interface is allowed to transmit or receive the OSPFv3 packets.

Command mode

Routing configuration mode

Instruction

Different processes can forbid a same interface to transmit or receive the OSPFv3 packets, but the passive-interface command takes effect only on the OSPFv3 interface.

Example

The following example shows how to forbid interface vlan1 to receive and transmit the OSPFv3 packets in the OSPFv3 process.

```
router ospfv3 100
  passive –interface vlan 1
```

Related command

None

1.1.29 redistribute

To configure the route where OSPF forwards other routing protocols, run **redistribute**. To resume the default settings, run **no redistribute**.

redistribute *protocol* [*as-number*] [**route-map *map-tag***]

no redistribute *protocol* [*as-number*] [**route-map *map-tag***]

Parameter

Parameter	Description
protocol	Means to forward the learned original protocol.
as_number	Means the number of the autonomous system which is not for the **connect**, **rip** or **static** parameter.
map-tag	Means the name of the route map.

Default value

Not forward

Command mode

Routing configuration mode

Instruction

None

Example

The following example shows how to forward the static route in OSPF process 1:

```
interface vlan 1
    ipv6 enable
    ipv6 ospf 1 area 0
!
router ospfv3 1
    router-id 2.2.2.2
redistribute static
```

1.1.30 **router** ospfv3

To enable OSPFv3 and enter the OSPFv3 configuration view, run the first one of the following two commands:

router ospfv3 *process-id*

no router ospfv3 *process-id*

Parameter

Parameter	Description
process-id	Identifies the OSPF process. It is a positive integer distributed by the local router.

Default value

None

Command mode

Global configuration mode

Instruction

One router may have multiple OSPFv3 processes.

Example

The following example shows how to set an OSPFv3 process, whose process ID is 109:

router ospfv3 109

Related command

ipv6 ospf area

1.1.31 router-id

To set the router ID in the autonomous system for the router on which the OSPFv3 protocol is running, run the first one of the following two commands:

router-id *router-id*

no router-id *router-id*

Parameter

Parameter	Description
router-id	Means the identifier of the router, which is in the IPv4 address format.

Default value

If an IPv4 address has already configured on a router before OSPFv3 is enabled, the router will automatically choose an IPv4 address as its ID.

Command mode

Routing configuration mode

Instruction

The router ID is the unique identifier of a OSPFv3-running router in the autonomous system, so the router IDs of two routers in the autonomous system are different. If a router has no router ID, the OSPFv3 process cannot go on.

Example

The following example shows how to set the router ID of OSPFv3 process 1 to 2.2.2.2:

```
router ospfv3 1
  router-id 2.2.2.2
```

1.1.32 show ipv6 ospf

To display the main OSPFv3 information, run the following command:

show ipv6 ospf [*process-id*]

Parameter

Parameter	Description
process-id	Means the OSPF process ID.

Default value

None

Command mode

EXEC

Instruction

The information exported by the command can help checking the OSPFv3 faults. If the **process-id** parameter follows the command, the information about the global configuration of the OSPFv3 process is displayed.

Example

The following example shows that the configuration information about all OSPFv3 processes will be displayed.

```
router# show ipv6 ospf
```

Routing Process "OSPFv3 0" with ID 1.2.3.4
SPF schedule delay 5 secs, Hold time between SPFs 10 secs Minimum LSA interval 5 secs, Minimum LSA arrival 1 secs Number of external LSA 3. Checksum Sum 0x2CD6F
Number of areas in this router is 1
Area BACKBONE(0)
Number of interfaces in this area is 1
SPF algorithm executed 3 times
Number of LSA 4. Checksum Sum
0x2A6AC router#

Relative fields are explained in the following table:

Domain	Description
Routing Process "OSPFv3 0"	ID of the process
with ID 1.2.3.4	ID of the router
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs	Two timer values relative with OSPF
Number of areas is 1	Number of the currently-configured fields, and parameters configured in each field
Number of LSA 4	Quantity of LSAs in the database
Number of external LSA 3	Quantity of ASE LSAs in the database
SPF algorithm executed 3 times	SPF algorithm execution statistics

1.1.33 **show** ipv6 ospf database

To display the database information about the OSPFv3 connection state, run the following command:

show ipv6 ospf database { router | network | inter-prefix | inter-router | external | link | intra-prefix **} [** ADVROUTER **]**

Parameter

Parameter	Description
router	Means the LSA type is the router.
network	Means the LSA type is the network.
inter-prefix	Means the LSA type is the inter-domain route.
inter-router	Means the LSA type is the inter-domain router.
external	Means the LSA type is the exterior route.
link	Means the LSA type is the link.

intra-prefix	Means the LSA type is the inside-domain route.
ADVROUTER	Means to declare the router ID.

Default value

None

Command mode

EXEC

Instruction

The information exported by the command can help to check the database information about the OSPFv3 connection state and to find the reason of the faults.

Example

router#
router#show ipv6 ospf database
Link-LSA (Interface eth0)
Link State ID ADV Router Age Seq# CkSum
Prefix 0.0.0.3 1.2.3.4 104 0x80000004 0x889e 0
0.0.0.5 5.6.7.8 142 0x80000003 0xab70 2
Router-LSA (Area 0.0.0.0)
Link State ID ADV Router Age Seq# CkSum Link
0.0.0.1 1.2.3.4 94 0x80000014 0xeaea 1
0.0.0.1 5.6.7.8 105 0x80000019 0x8a32 1
Network-LSA (Area 0.0.0.0)
Link State ID ADV Router Age Seq# CkSum
0.0.0.5 5.6.7.8 105 0x80000001 0xa441
Intra-Area-Prefix-LSA (Area 0.0.0.0)
Link State ID ADV Router Age Seq# CkSum Prefix Reference
0.0.0.1 5.6.7.8 104 0x80000001 0x8d4f 2 Network-LSA
AS-external-LSA
Link State ID ADV Router Age Seq# CkSum
0.0.0.1 5.6.7.8 1229 0x80000002 0xe92d
0.0.0.2 5.6.7.8 1229 0x80000002 0xef25
0.0.0.3 5.6.7.8 1229 0x80000002 0xf51d
router#

Relative fields are explained in the following table:

Domain	Description
AREA: 1	Current area
Router Link	LSA type

States/Net Link States/Summary Net Link States	
Link ID	LSA ID
ADV Router	Releases the router.
Age	Releases the age.
Seq #	Generates the sequence ID.
Checksum	Means the checksum.

1.1.34 **show** ipv6 ospf interface

To display the information about the OSPFv3 interface, run the following command:

show ipv6 ospf interface [type] [index]

Parameter

Parameter	Description
type	Port type
index	Port number

Default value

None

Command mode

EXEC

Instruction

According to the information displayed by the command, you can check the OSPFv3 configuration and its running state, which helps you to detect the OSPFv3 faults.

Example

router#**show ipv6 ospf interface**
ethernet0/1 is up, line protocol is up
Interface ID 3, Instance ID 0, Area 0.0.0.0
IPv6 Link-Local Address fe80::248:54ff:fec0:f32d/10
Router ID 1.2.3.4, Network Type BROADCAST, Cost:
10 Transmit Delay is 1 sec, State Backup, Priority 1
Designated Router (ID) 5.6.7.8
Interface Address fe80::203:47ff:fe4c:776e

Backup Designated Router (ID) 1.2.3.4
Interface Address fe80::248:54ff:fec0:f32d
Timer interval configured, Hello 10, Dead 40, Wait 40, Retransmit
5 Hello due in 00:00:01
Neighbor Count is 1, Adjacent neighbor count is
1 router#

Relative fields are explained in the following table:

Domain	Description
IPv6 Link-Local Address	Address of port **IPv6 link-local**
Nettype	Network type of the OSPF interface
OSPF process is	ID of the OSPF process
AREA	Current area
Router ID	ID of the router where the process belongs
Cost	Cost of the OSPF interface of the router
Transmit Delay is	Transmission delay
Priority	Priority for the interface of the router
Hello interval	Transmission interval of the Hello packet
Dead timer	Dead time
Retransmit	Retransmission interval
OSPF INTF State is	State of the OSPF port
Designated Router id	ID of the designated router and the IP address of its port
Backup Designated router id	ID of the backup designated router and the IP address of its port
Neighbor Count is	Number of the neighboring routers
Adjacent neighbor count is	Number of neighbors that have established the neighborhood relation
Adjacent with neighbor	Neighbor lists that have established the neighborhood relation

1.1.35 **show** ipv6 ospf neighbor

To display the information about OSPFv3 neighbor, run the following command.

show ipv6 ospf neighbor [interface_type interface_number | router-id | detail]

Parameter

Parameter	Description
interface_type	Port type

interface_number	Port number
router-id	Router ID
detail	Displays the detailed information.

Default value

None

Command mode

EXEC

Instruction

The information displayed by the command can help you to check whether the OSPFv3 neighbor configuration is right and to detect the OSPFv3 faults.

Example

router#**show ipv6 ospf neighbor**

OSPFv3 Process 1

Area 1

Neighbor ID Pri State Dead Time Interface Instance ID

5.6.7.8 1 Full/DR 00:00:38 eth0 0

Relative fields are explained in the following table:

Domain	Description
OSPFv3 process	ID of the OSPF process
AREA	Local area
Neighbor	ID of a neighbor
Pri	Priority of a neighbor
State	Connection state related with the neighbor
DeadTime	Time of neighbor invalidation
Address	IP address of the neighbor
Interface	Interface used by a router to reach its neighbor

1.1.36 **show** ipv6 ospf route

To display the information about the OSPFv3 routing table, run the following command:

show ipv6 ospf route

Parameter

None

Default value

None

Command mode

EXEC

Instruction

The information displayed by the command can help you browse the OSPFv3 routing table and confirm whether the OSPFv3 trouble diagnosis is correctly carried out.

Example

router#**show ipv6 ospf route**
Destination Metric
Next-hop Interface
3ffe:1:1::/48 10
-- eth0
3ffe:2:1::/48 10
-- eth0
3ffe:2:2::/48 10
-- eth0
3ffe:3:1::/48 10
-- eth0
3ffe:3:2::/48 10
-- eth0
3ffe:3:3::/48 10
-- eth0
E2 3ffe:100:1::1/128 10/20
fe80::203:47ff:fe4c:776e eth0
E2 3ffe:100:2::1/128 10/20
fe80::203:47ff:fe4c:776e eth0
E2 3ffe:100:3::1/128 10/20
fe80::203:47ff:fe4c:776e eth0
IA 3ffe:101:1::/48 20
fe80::203:47ff:fe4c:776e eth0
IA 3ffe:101:2::/48 20
fe80::203:47ff:fe4c:776e eth0
IA 3ffe:101:3::/48 20
fe80::203:47ff:fe4c:776e eth0

Relative fields are explained in the following table:

Domain	Description
Destination	Destination network segment
Metric	Cost of a route
Next-hop	Address of the next hop
Interface	Interface of the next hop

1.1.37 show ipv6 ospf virtual-link

To display the information about the OSPFv3 virtual link, run the following command:

show ipv6 ospf virtual-link

Parameter

None

Default value

None

Command mode

EXEC

Instruction

According to the information exported by the command, you can check the state of the OSPFv3 virtual link.

You can run **show ipv6 ospf neighbor** to check the detailed information about the adjacent neighbor.

Example

router#show ipv6 ospf virtual-link

Virtual Link VLINK1 to router 5.6.7.8 is up

Transit area 0.0.0.1 via interface eth0, instance ID 0

Local address 3ffe:1234:1::1/128

Remote address 3ffe:5678:3::1/128

Transmit Delay is 1 sec, State Point-To-Point,

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

Hello due in 00:00:01

Adjacency state Up

Relative fields are explained in the following table:

Domain	Description
neibhbor ID	Neighbor ID of the peer
TransArea	Transmission area
cost	Minimum cost for reaching the peer in the transmission area If the value of the cost is 0, it means that the peer is unreachable.
Hello Interval	Current transmission interval for the Hello packet
DeadTime	Time of neighbor invalidation
Retrans	Retransmission interval
Adjacency state	State of the virtual link interface

Related command

area vritual-link

show ipv6 ospf neighbor

1.1.38 summary-prefix

To configure the address for OSPFv3 to create the route aggregation, run **summary-prefix**. To cancel the address of route aggregation, run **no summary-prefix**.

summary-prefix *ipv6-prefix /prefix-length*

no summary-prefix *ipv6-prefix /prefix-length*

Parameter

Parameter	Description
ipv6-prefix	Aggregation address with the designated address range
prefix-length	Subnet mask of the aggregation route

Default value

None

Command mode

Routing configuration mode

Instruction

Multiple groups of addresses are summarized. Routes learned from other routing protocols can also be summarized. After the aggregation, all covered networks cannot be transmitted to other routing fields. The cost of the summary route is the minimum value among the cost values of all summary routes. The command cannot be used to reduce the size of the routing table.

The command is used by OSPFv3 to enable the ASBR to notify an external route of being an aggregation route to replace all external routes. The command is only used to aggregate the OSPFv3 routes of other routing protocols. You can run **area range** in OSPFv3 to summarize the routes.

Example

In the following example, the summary address 2001::/64 stands for addresses such as 2001::/80, 2001::1/64 and so on, and only address 2001::/64 is broadcasted.

summary-address 2001::/64

Related command

area range

1.1.39 **timers** delay

To designate a delay interval between OSPF receiving a topology change and starting a shortest path priority calculation, run **timers delay *spf-delay***. To resume the default settings, run **no timers delay**.

timers delay *spf-delay*

no timers delay

Parameter

Parameter	Description
spf-delay	Delay between the topology change and calculation start Its default value is 5 seconds. If the value is 0, there is no delay. That is, the calculation will be promptly started if changes occur.

Default value

spf-delay: 5 seconds

Command mode

Routing configuration mode

Instruction

The smaller value the delay is set to, the faster the network change is reflected. However, it will take the processor more time.

Example

The following example shows how to set the time for OSPF to start calculating the delay is 10 seconds.

timers delay 10

1.1.40 **timers** hold

To set the interval between two continuous SPF calculations, run **timers hold**. To resume the default settings, run **no timers hold**.

timers hold *spf-holdtime*

no timers hold

Parameter

Parameter	Description
spf-holdtime	Minimum value between two continuous calculations It ranges between 0 to 65535 seconds. Its default value is 10 seconds; when it is 0, there is no interval between the two continuous calculations.

Default value

spf-holdtime: 10 seconds

Command mode

Routing configuration mode

Instruction

The smaller value the delay is set to, the faster the network change is reflected. However, it will take the processor more time.

Example

The following example shows how to set the interval between two successive SPF calculations to 20 seconds:

timers hold 20