



DANOS-Vyatta edition

Disaggregated Network Operating System Version 2009a

OSPFv3 Configuration Guide
October 2020

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Chapter 1. Copyright Statement

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Chapter 2. Preface

Document conventions

The document conventions describe text formatting conventions, command syntax conventions, and important notice formats used in this document.

Notes, cautions, and warnings

Notes, cautions, and warning statements may be used in this document. They are listed in the order of increasing severity of potential hazards.

 **Note:** A Note provides a tip, guidance, or advice, emphasizes important information, or provides a reference to related information.

 **Attention:** An Attention statement indicates a stronger note, for example, to alert you when traffic might be interrupted or the device might reboot.

 **CAUTION:** A Caution statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

 **DANGER:** A Danger statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

Text formatting conventions

Text formatting conventions such as boldface, italic, or Courier font are used to highlight specific words or phrases.

Format	Description
bold text	Identifies command names. Identifies keywords and operands.
<i>italic text</i>	Identifies emphasis. Identifies variables. Identifies document titles.
<code>Courier font</code>	Identifies CLI output. Identifies command syntax examples.

Command syntax conventions

Bold and italic text identify command syntax components. Delimiters and operators define groupings of parameters and their logical relationships.

Convention	Description
bold text	Identifies command names, keywords, and command options.
<i>italic text</i>	Identifies a variable.
[]	Syntax components displayed within square brackets are optional. Default responses to system prompts are enclosed in square brackets.
{ x y z }	A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options.
x y	A vertical bar separates mutually exclusive elements.
< >	Nonprinting characters, for example, passwords, are enclosed in angle brackets.
...	Repeat the previous element, for example, <i>member</i> [<i>member</i> ...].
\	Indicates a “soft” line break in command examples. If a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash.

Chapter 3. About This Guide

This guide describes how to configure OSPFv3 on DANOS-Vyatta edition.

Chapter 4. OSPFv3 Configuration

OSPFv3 overview

Open Shortest Path First Version 3 (OSPFv3) is a link-state Interior Gateway Protocol (IGP) developed by IETF and is based on OSPF Version 2 (OSPFv2), which supports IPv4. For more information about OSPFv2, refer to *OSPF Configuration Guide*. OSPFv3 adds support for IPv6 in the OSPF routing protocol and is described in RFC 5340. OSPFv3 works as in OSPFv2, that is, OSPFv3 router IDs, area IDs, and LSA link-state IDs are 32 bits as in OSPFv2 IPv4. In addition, all optional capabilities of OSPFv2 for IPv4, for example, NSSA, are supported in OSPFv3 for IPv6. Most OSPFv3 capabilities are expanded from OSPFv2 to support the IPv6 address family, but OSPFv3 does not depend on OSPFv2 configurations. OSPFv3 works independently.

However, some significant changes exist in OSPFv3 for IPv6 and these changes include the following:

- Router LSAs and network LSAs no longer carry prefix information. In OSPFv3, these LSAs carry only the topology information.
- New and modified LSAs have been created to handle the flow of IPv6 addresses and prefixes in an OSPFv3 network.
- OSPFv3 runs on a per-link basis, instead of a per-IP-subnet basis. Two nodes can communicate over a link even when they do not share a common IPv6 prefix.
- OSPFv3 supports stub areas.
- IPv6 link-local addresses are used for OSPFv3 neighbor exchanges, except over virtual links. Link-local addresses have local significance only.
- The 32-bit router ID in OSPFv3 always identifies neighboring routers.
- The flooding scope for LSAs is generalized into three categories for OSPFv3:
 - Link-local scope. The OSPFv3 packet is flooded only to the members connected on a link.
 - Area scope. The OSPFv3 packet is flooded to all members of an OSPFv3 area.
 - AS scope. The OSPFv3 packet is flooded to all members of an AS.
- LSPs and traffic engineering are not supported in OSPFv3.
- In OSPFv3, the Options field is available in only Hello packets, DD packets, Router LSAs, Network LSAs, Inter-Area-Router LSAs, and Link LSAs.
- OSPFv3 has two new LSAs: Link LSA and Intra Area Prefix LSA.
- OSPFv3 communicates over IPv6, but can carry routing data for other address families, that is IPv4 and multicast.

OSPFv3 adds support for address families which helps OSPFv3 IPv6 networks to support both IPv6 and IPv4 nodes. For more information on this feature, refer to [Support for OSPFv3 address families](#).

Support for OSPFv3 address families

OSPFv3 communicates with peer routers over IPv6, but can carry routing data for other address families. By default, OSPFv3 supports the IPv6 unicast address family. However, OSPFv3 can support other address families when configured to do so. The router OSPFv3 implementation provides support for carrying IPv4 and IPv6 unicast routing data.

It is important to understand that instance identifiers not only identify a routing instance, but also identify an address family. The following are the instance IDs breakdown:

- Instance ID 0 to 31: IPv6 unicast AF
- Instance ID 32 to 63: IPv6 multicast AF
- Instance ID 64 to 95: IPv4 unicast AF
- Instance ID 96 to 127: IPv4 multicast AF

OSPFv3 supports multiple OSPFv3 processes under default VRF and each process may support one address family.

 **Note:** OSPFv3 supports only one OSPFv3 process under non-default VRF.

Supports one routing instance within each OSPFv3 process.

Supports only IPv4 address family

Default OSPFv3 process does not provide address family support.

Supported standard

DANOS-Vyatta edition OSPFv3 complies with the following standards:

- RFC 5340, OSPF for IPv6
- RFC 5838, Support of Address Families in OSPFv3
- RFC 3101, The OSPF Not-SO-Stubby Area (NSSA) Option
- RFC 5643, Management Information Base for OSPFv3

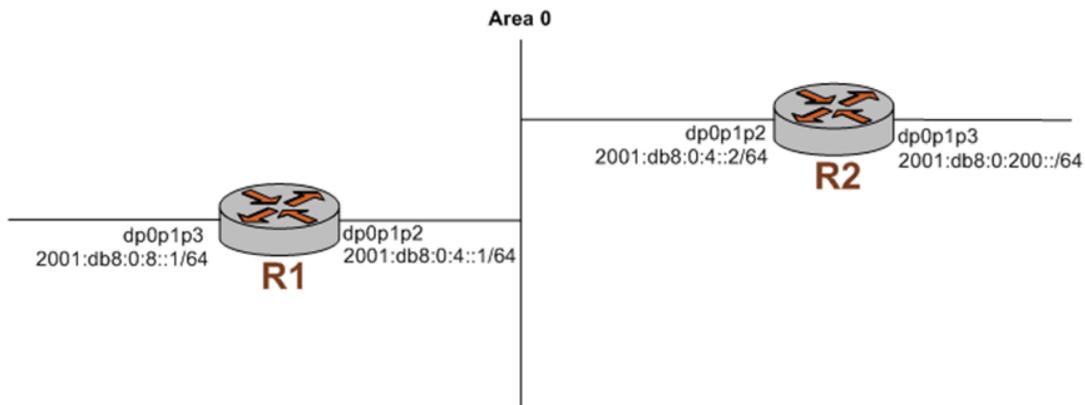
Configuring OSPFv3

This section provides the following topics:

- [Basic OSPFv3 configuration](#)
- [Verifying the OSPFv3 configuration](#)

This section presents a sample configuration for OSPFv3. The configuration example is based on the following reference diagram.

Figure 1. OSPFv3 configuration reference diagram



Basic OSPFv3 configuration

In this section, you configure OSPFv3 on the routers labeled R1 and R2 in the reference network diagram.

To create a basic OSPFv3 configuration, perform the following steps in configuration mode:

Table 1. Basic OSPFv3 configuration

Router	Step	Commands
Configure Interface IP addresses and OSPFv3 Configuration		
R1	Set an IPv6 address on interface dp0p1p2.	<pre>vyatta@R1# set interfaces dataplane dp0p1p2 address 2001:db8:0:4::1/64</pre>
R1	Set an IPv6 address on interface dp0p1p3.	<pre>vyatta@R1# set interfaces dataplane dp0p1p3 address 2001:db8:0:8::1/64</pre>
R1	Set the OSPFv3 area on interface dp0p1p2.	<pre>vyatta@R1# set interfaces dataplane dp0p1p2 ipv6 ospfv3 area 0.0.0.0</pre>
R1	Set the OSPFv3 area on interface dp0p1p3.	<pre>vyatta@R1# set interfaces dataplane dp0p1p3 ipv6 ospfv3 area 0.0.0.0</pre>
R1	Set the OSPFv3 area for a given process ID and instance ID on interface dp0p1p2.	<pre>vyatta@R1# set interfaces dataplane dp0p1p2 ipv6 ospfv3 process labR instance-id 3 area 0.0.0.0</pre>
R1	Set the OSPFv3 area for a given process ID and instance ID on interface dp0p1p3.	<pre>vyatta@R1# set interfaces dataplane dp0p1p3 ipv6 ospfv3 process labR instance-id 3 area 0.0.0.0</pre>
R1	Display the configuration.	<pre>vyatta@R1# show interfaces dataplane dp0p1p2 { address 2001:db8:0:4::1/64 duplex auto hw-id 00:0c:29:09:3e:73 ipv6 { dup-addr-detect-transmits 1 ospfv3 { area 0.0.0.0 process labR { instance-id 3 { area 0.0.0.0 } } } } }</pre>

Verifying OSPFv3 on R1: "show ipv6 route"

```
vyatta@R1:~$ show ipv6 route
IPv6 Routing Table
Codes: K - kernel route, C - connected, S - static, R - RIP, O - OSPF,
      IA - OSPF inter area, E1 - OSPF external type 1,
      E2 - OSPF external type 2, I - IS-IS, B - BGP
      > - selected route, * - FIB route, p - stale info
Timers: Uptime
C  *> ::1/128 is directly connected, lo
O   2001:db8:0:4::/64 [110/1] is directly connected, dp0p1p2, 23:39:41
C  *> 2001:db8:0:4::/64 is directly connected, dp0p1p2
O   2001:db8:0:8::/64 [110/1] is directly connected, dp0p1p3, 23:39:41
C  *> 2001:db8:0:8::/64 is directly connected, dp0p1p3
C  *  fe80::/64 is directly connected, dp0p1p2
C  *  fe80::/64 is directly connected, dp0p1p1
C  *> fe80::/64 is directly connected, dp0p1p3
K  *> ff00::/8 is directly connected, dp0p1p2
K  *  ff00::/8 is directly connected, dp0p1p1
K  *  ff00::/8 is directly connected, dp0p1p3
```

R2: show ipv6 ospfv3 neighbor

The following example shows the output of the `show ipv6 ospfv3 neighbor` command for router R2.

Verifying OSPFv3 on R2: "show ipv6 ospfv3 neighbor"

```
vyatta@R2:~$ show ipv6 ospfv3 neighbor
OSPFv3 Process (labR)
Neighbor ID      Pri   State                Dead Time   Interface   Instance ID
10.10.10.10      1     Full/Backup          00:00:36   dp0p1p2 3
```

R2: show ipv6 route

The following example shows the output of the `show ipv6 route` command for router R2.

Verifying OSPFv3 on R2: "show ipv6 route"

```
vyatta@R2:~$ show ipv6 route
IPv6 Routing Table
Codes: K - kernel route, C - connected, S - static, R - RIP, O - OSPF,
      IA - OSPF inter area, E1 - OSPF external type 1,
      E2 - OSPF external type 2, I - IS-IS, B - BGP
      > - selected route, * - FIB route, p - stale info
Timers: Uptime
```

```

C   * > ::1/128 is directly connected, lo
O   2001:db8:0:4::/64 [110/1] is directly connected, dp0p1p2, 23:44:53
C   * > 2001:db8:0:4::/64 is directly connected, dp0p1p2
O   * > 2001:db8:0:8::/64 [110/2] via fe80::20c:29ff:fe09:3e73, dp0p1p2,
    23:44:02
C   * > 2001:db8:0:200::/64 is directly connected, dp0p1p3
C   * > 2004::/64 is directly connected, lo
C   * fe80::/64 is directly connected, dp0p1p2
C   * fe80::/64 is directly connected, dp0p1p1
C   * > fe80::/64 is directly connected, dp0p1p3
K   * > ff00::/8 is directly connected, dp0p1p2
K   * ff00::/8 is directly connected, dp0p1p1
K   * ff00::/8 is directly connected, dp0p1p3

```

R2: ping 2001:db8:0:8::1

Using the **ping** command from R2, we can verify that we can reach hosts on remote networks. In this case we ping an IP address on R1. This verification is shown in the following example.

Verifying OSPF on R2: “ping6 2001:db8:0:8::1”

```

vyatta@R2# ping6 2001:db8:0:8::1
PING 2001:db8:0:8::1(2001:db8:0:8::1) 56 data bytes
64 bytes from 2001:db8:0:8::1: icmp_seq=1 ttl=64 time=0.460 ms
64 bytes from 2001:db8:0:8::1: icmp_seq=2 ttl=64 time=0.153 ms
64 bytes from 2001:db8:0:8::1: icmp_seq=3 ttl=64 time=0.209 ms
64 bytes from 2001:db8:0:8::1: icmp_seq=4 ttl=64 time=0.156 ms
64 bytes from 2001:db8:0:8::1: icmp_seq=5 ttl=64 time=0.163 ms
64 bytes from 2001:db8:0:8::1: icmp_seq=6 ttl=64 time=0.159 ms
--- 2001:db8:0:8::1 ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 4997ms
rtt min/avg/max/mdev = 0.153/0.216/0.460/0.111 ms

```

The output confirms that the OSPFv3 configuration is working and that we are able to reach a remote network.

Removing router-id overlap

If the router detects multiple OSPF or OSPFv3 processes that are running in a routing instance have the same router ID, the router sends router-id overlap notifications to syslog. The router also displays router-id overlap notifications in the output of the **show ip ospf** and **show ipv6 ospfv3** commands.

In the following example, the lines that start with the ******* characters indicate an overlap in the router IDs that were allocated by the router.

```

vyatta@vyatta# set protocols ospf
[edit]

```

```

vyatta@vyatta# set protocols ospf process 7
[edit]
vyatta@vyatta# commit
[edit]
vyatta@vyatta# run show ip ospf
  Routing Process "ospf 0" with ID 1.1.1.1
** Allocated Router ID 1.1.1.1 overlaps with one or more ospf processes -
  please reconfigure **
  Process uptime is 4 minutes
  Process bound to routing-instance default
  Conforms to RFC2328, and RFC1583 Compatibility flag is disabled
  Supports only single TOS(TOS0) routes
  Supports opaque LSA
  Does not support Restarting
  SPF schedule delay initial 0 secs 500 msec
  SPF schedule delay min 0 secs 500 msec
  SPF schedule delay max 50 secs 0 msec
  Refresh timer 10 secs
  Number of incoming current DD exchange neighbors 0/64
  Number of outgoing current DD exchange neighbors 0/64
  Initial LSA throttle delay 0 secs 0 msec
  Minimum hold time for LSA throttle 5 secs 0 msec
  Maximum wait time for LSA throttle 5 secs 0 msec
  Minimum LSA arrival 1 secs 0 msec
  Number of external LSA 0. Checksum 0x000000
  Number of opaque AS LSA 0. Checksum 0x000000
  Number of non-default external LSA 0
  External LSA database is unlimited.
  Number of LSA originated 0
  Number of LSA received 0
  Number of areas attached to this router: 0

[edit]
vyatta@vyatta# run show ip ospf process 7
  Routing Process "ospf 7" with ID 1.1.1.1
** Allocated Router ID 1.1.1.1 overlaps with one or more ospf processes -
  please reconfigure **
  Process uptime is 12 minutes
  ...
[edit]

```

The following example shows an overlap between the router ID that the router allocated to process 0 and the router ID that a user configured for process 4.

```

vyatta@vyatta# set protocols ospf process 4 parameters router-id 1.1.1.1
vyatta@vyatta# set protocols ospf
vyatta@vyatta# commit
vyatta@vyatta# run show ip ospf
  Routing Process "ospf 0" with ID 1.1.1.1
** Allocated Router ID 1.1.1.1 overlaps with one or more ospf processes -
  please reconfigure **
  Process uptime is 27 minutes
  ...

```

```
vyatta@vyatta# run show ip ospf process 4
Routing Process "ospf 4" with ID 1.1.1.1
** Configured Router ID 1.1.1.1 overlaps with one or more ospf processes -
please reconfigure **
Process uptime is 6 minutes
...
```

The following example shows overlap in router IDs allocated to OSPFv3 processes by the router.

```
vyatta@vyatta# set protocols ospfv3
[edit]
vyatta@vyatta# set protocols ospfv3 process 1
[edit]
vyatta@vyatta# commit
[edit]
vyatta@vyatta# run show ipv6 ospfv3
Routing Process "OSPFv3 (*null*)" with ID 10.18.170.230
** Allocated Router ID 10.18.170.230 overlaps with one or more processes -
please reconfigure **
Process uptime is 0 minute
Process bound to routing-instance default
SPF schedule delay initial 0.500 secs
SPF schedule delay min 0.500 secs
SPF schedule delay max 50.0 secs
Minimum LSA interval 5 secs, Minimum LSA arrival 1 secs
Number of incoming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 0. Checksum Sum 0x0000
Number of AS-Scoped Unknown LSA 0
Number of LSA originated 0
Number of LSA received 0
Number of areas in this router is 0

[edit]
vyatta@vyatta# run show ipv6 ospfv3 process 1
Routing Process "OSPFv3 (1)" with ID 10.18.170.230
** Allocated Router ID 10.18.170.230 overlaps with one or more processes -
please reconfigure **
Process uptime is 1 minute
...
[edit]
```

The following example shows an overlap between the router ID that the router allocated to OSPFv3 process 3 and the router ID that a user configured for OSPFv3 process 0.

```
vyatta@vyatta# set protocols ospfv3 router-id 1.1.1.1
[edit]
vyatta@vyatta# set protocols ospfv3 process 3
[edit]
vyatta@vyatta# commit
[edit]
vyatta@vyatta# run show ipv6 ospfv3
```

```

Routing Process "OSPFv3 (*null*)" with ID 1.1.1.1
** Configured Router ID 10.18.170.230 overlaps with one or more processes -
please reconfigure **
Process uptime is 0 minute
...
[edit]
vyatta@vyatta# run show ipv6 ospfv3 process 3
Routing Process "OSPFv3 (3)" with ID 1.1.1.1
** Allocated Router ID 1.1.1.1 overlaps with one or more processes - please
reconfigure **
Process uptime is 1 minute
...
[edit]

```

To remove router-id overlap, use the **set protocols ospf parameters router-id** and **set protocols ospfv3 router-id** commands to configure unique router IDs for OSPF and OSPFv3 processes, respectively.

Range cost configuration

This feature lets you assign a fixed cost to IPv4 and IPv6 area summary routes in OSPFv3, including routing instances.

Area Border Routers (ABRs) can advertise a summary route instead of individual routes that originate within an AS. This feature lets you specify a fixed cost to advertise along with the summary route. If a fixed cost is not specified, the cost of the summary route is the maximum cost of all the individual routes that are in the summary route.

This feature applies to inter-AS summary routes configured through the area range command. This feature does not apply to external routes that are redistributed into OSPF.

To use this feature, you override the the calculated routing cost with a fixed cost.

If you do not configure a cost for the summary route, then the cost is calculated automatically as the maximum cost of all the individual routes that are covered by the summary. If you do configure a cost, this overrides that automatic calculation.

Configuring a fixed cost metric for an area summary range is significant only when the range is advertised to peers. For example, if the range is configured as not-advertise or if no path matches the range, it is not advertised.

The range's configuration can include the not-advertise parameter. If not-advertise is specified:

- No prefixes that match the range are advertised.
- The range itself is not advertised.
- Any configured cost for the range is meaningless and is ignored.
- If the not-advertise condition is subsequently removed, any fixed-cost configuration is applied.

Also note the following:

- If no prefixes are matched in the range configuration, the range is not advertised.
- If one or more prefixes do match the range, the whole range is advertised instead of just the matching prefixes (unless the range is configured with not-advertise).

Any change in the cost configuration (adding a cost, removing the cost, or changing the cost value) causes OSPF to send the new cost in an update to its peers.

Example

An ABR has an interface dp0p1s1 in area 0 and interfaces dp0p1s2.100, dp0p1s2.101, and dp0p1s2.102 in area 1. The ABR summarizes the range 10:100::/30 from area 1 into area 0.

This is the configuration:

```
vyatta@vm-yv-3:~# set interfaces dataplane dp0p1s1 address '10:10:3::3/64'
vyatta@vm-yv-3:~# set interfaces dataplane dp0p1s1 ipv6 ospfv3 area '0'
vyatta@vm-yv-3:~# set interfaces dataplane dp0p1s2 vif 100 address
'10:100:4::3/64'
vyatta@vm-yv-3:~# set interfaces dataplane dp0p1s2 vif 100 ipv6 ospfv3 area
'1'
vyatta@vm-yv-3:~# set interfaces dataplane dp0p1s2 vif 100 ipv6 ospfv3 cost
'10'
vyatta@vm-yv-3:~# set interfaces dataplane dp0p1s2 vif 101 address
'10:101:4::3/64'
vyatta@vm-yv-3:~# set interfaces dataplane dp0p1s2 vif 101 ipv6 ospfv3 area
'1'
vyatta@vm-yv-3:~# set interfaces dataplane dp0p1s2 vif 101 ipv6 ospfv3 cost
'11'
vyatta@vm-yv-3:~# set interfaces dataplane dp0p1s2 vif 102 address
'10:102:4::3/64'
vyatta@vm-yv-3:~# set interfaces dataplane dp0p1s2 vif 102 ipv6 ospfv3 area
'1'
vyatta@vm-yv-3:~# set interfaces dataplane dp0p1s2 vif 102 ipv6 ospfv3 cost
'12'
vyatta@vm-yv-3:~# set interfaces loopback lo address '3.3.3.3/32'
vyatta@vm-yv-3:~# set protocols ospfv3 area '0'
vyatta@vm-yv-3:~# set protocols ospfv3 area 1 range '10:100::/30'
vyatta@vm-yv-3:~# commit
vyatta@vm-yv-3:~# exit
```

No explicitly configured metric exists for the range, so the ABR advertises the maximum cost to reach all prefixes that match the range. This cost will be at least 12 and possibly more if the ABR learns of a matching prefix from one of its area 1 peers.

```
vyatta@vm-yv-3:~$ show ipv6 ospfv3 database inter-prefix self-originate
      OSPFv3 Router with ID (3.3.3.3) (Process *null*)
      Routing-instance default)
          Inter-Area-Prefix-LSA (Area 0.0.0.0)
      LS age: 305
      LS Type: Inter-Area-Prefix-LSA
      Link State ID: 0.0.0.3
```

```

Advertising Router: 3.3.3.3
LS Seq Number: 0x80000002
Checksum: 0x1ED1
Length: 32
  Metric: 12
  Prefix: 10:100::/30
  Prefix Options: 02

```

The metric can be set for the range through explicit configuration:

```

vyatta@vm-yv-3:~# set protocols ospfv3 area 1 range 10:100::/30 metric 20
vyatta@vm-yv-3:~# commit
vyatta@vm-yv-3:~# exit
vyatta@vm-yv-3:~$ show ipv6 ospfv3 database inter-prefix self-originate
      OSPFv3 Router with ID (3.3.3.3) (Process *null*
Routing-instance default)
      Inter-Area-Prefix-LSA (Area 0.0.0.0)
LS age: 31
LS Type: Inter-Area-Prefix-LSA
Link State ID: 0.0.0.3
Advertising Router: 3.3.3.3
LS Seq Number: 0x80000003
Checksum: 0x4C9A
  Length: 32
  Metric: 20
  Prefix: 10:100::/30
  Prefix Options: 0

```

Chapter 5. OSPFv3 Commands

monitor protocol ospfv3 disable all

Disables the generation of all debug messages related to OSPFv3.

```
monitor protocol ospfv3 [ process process-id ] disable all
```

OSPFv3 debugging is disabled.

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

all

Disables all debug messages.

Operational mode

Use this command to disable the generation of all debug messages related to OSPFv3.

monitor protocol ospfv3 disable bfd

Disables the generation of debug messages related to OSPFv3 BFD events.

```
monitor protocol ospfv3 [ process process-id ] disable bfd
```

OSPFv3 BFD event debugging is disabled.

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

bfd

Disables debugging of BFD events.

Operational mode

Use this command to disable the generation of debug messages related to OSPFv3 Bidirectional Forwarding Detection (BFD) events.

monitor protocol ospfv3 disable events

Disables the generation of debug messages related to OSPFv3 events.

```
monitor protocol ospfv3 [ process process-id ] disable events [ abr | asbr | nssa | os | router | vlink ]
```

OSPFv3 event debugging is disabled.

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

abr

Disables debugging of Area Border Router (ABR) events.

asbr

Disables debugging of Autonomous System Boundary Router (ASBR) events.

nssa

Disables debugging of not-so-stubby area (NSSA) events.

os

Disables debugging of OS-interaction events.

router

Disables debugging of other router events.

vlink

Disables debugging of virtual-link events.

Operational mode

Use this command to disable the generation of debug messages related to OSPFv3 events.

monitor protocol ospfv3 disable ifsm

Disables the generation of debug messages related to OSPFv3 Interface Finite State Machine (IFSM) events.

```
monitor protocol ospfv3 [ process process-id ] disable ifsm [ events | status | timers ]
```

OSPFv3 IFSM event debugging is disabled.

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

events

Disables debugging of IFSM events.

status

Disables debugging of IFSM status information.

timers

Disables debugging of IFSM timer information.

Operational mode

Use this command to disable the generation of debug messages related to OSPFv3 IFSM events.

monitor protocol ospfv3 disable lsa

Disables the generation of debug messages related to OSPFv3 Link State Advertisements (LSAs).

```
monitor protocol ospfv3 [ process process-id ] disable lsa [ flooding | generate | install | maxage | refresh ]
```

OSPFv3 LSA event debugging is disabled.

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

flooding

Disables debugging of OSPFv3 LSA flood events.

generate

Disables debugging of OSPFv3 LSA generation.

install

Disables debugging of OSPFv3 LSA installation.

maxage

Disables debugging of maximum age processing related OSPFv3 LSA.

refresh

Disables debugging of OSPFv3 LSA refreshes.

Operational mode

Use this command to disable the generation of debug messages related to OSPFv3 LSAs.

monitor protocol ospfv3 disable nfsm

Disables the generation of debug messages related to OSPFv3 Neighbor Finite State Machines (NFSMs).

```
monitor protocol ospfv3 [ process process-id ] disable nfsm [ events | status | timers ]
```

OSPFv3 NFSM debugging is disabled.

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

events

Disables debugging of OSPFv3 NFSM events.

status

Disables debugging of OSPFv3 NFSM status.

timers

Disables debugging of OSPFv3 NFSM timers.

Operational mode

Use this command to disable the generation of debug messages related to OSPFv3 NFSM.

monitor protocol ospfv3 disable nsm

Disables the generation of debug messages related to the OSPFv3 Network Services Module (NSM).

```
monitor protocol ospfv3 [ process process-id ] disable nsm interface
```

OSPFv3 NSM debugging is disabled.

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

interface

Disables debugging of OSPFv3 NSM interface events.

Operational mode

Use this command to disable the generation of debug messages related to the OSPFv3 NSM.

monitor protocol ospfv3 disable packet dd

Disables the generation of debug messages related to OSPFv3 Database Description (DD) packets.

```
monitor protocol ospfv3 [ process process-id ] disable packet dd [ detail | recv [ detail ] | send [ detail ] ]
```

Debug messages are disabled for OSPFv3 DD packets at a medium level of detail.

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

detail

Disables detailed debugging of OSPFv3 DD packets, both sent and received.

recv

Disables debugging of received OSPFv3 DD packets.

detail

Disables detailed debugging of received OSPFv3 DD packets.

send

Disables debugging of transmitted OSPFv3 DD packets.

detail

Disables detailed debugging of transmitted OSPFv3 DD packets.

Operational mode

Use this command to disable the generation of debug messages related to OSPFv3 DD packets.

monitor protocol ospfv3 disable packet detail

Disables the generation of debug messages related to OSPFv3 detailed packets.

```
monitor protocol ospfv3 [ process process-id ] disable packet detail
```

Debug messages are disabled for OSPFv3 detailed packets.

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

Operational mode

Use this command to disable the generation of debug messages related to OSPFv3 detailed packets.

monitor protocol ospfv3 disable packet hello

Disables the generation of debug messages related to OSPFv3 Hello packets.

```
monitor protocol ospfv3 [ process process-id ] disable packet hello [ [ detail | recv [ detail ] | send [ detail ] ] ]
```

Debug messages are disabled for OSPFv3 Hello packets at a medium level of detail.

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

detail

Disables detailed debugging of OSPFv3 Hello packets, both sent and received.

recv

Disables debugging of received OSPFv3 Hello packets.

detail

Disables detailed debugging of received OSPFv3 Hello packets.

send

Disables debugging of transmitted OSPFv3 Hello packets.

detail

Disables detailed debugging of transmitted OSPFv3 Hello packets.

Operational mode

Use this command to disable the generation of debug messages related to OSPFv3 Hello packets.

monitor protocol ospfv3 disable packet ls-ack

Disables the generation of debug messages related to OSPFv3 link-state acknowledgment (LS Ack) packets.

```
monitor protocol ospfv3 [ process process-id ] disable packet ls-ack [ detail |
recv [ detail ] | send [ detail ] ]
```

Debug messages are disabled for OSPFv3 LS Ack packets at a medium level of detail.

[process process-id] enable lsa [detail

Disables detailed debugging of OSPFv3 LS Ack packets, both sent and received.

recv

Disables debugging of received OSPFv3 LS Ack packets.

detail

Disables detailed debugging of received OSPFv3 LS Ack packets.

send

Disables debugging of transmitted OSPFv3 LS Ack packets.

detail

Disables detailed debugging of transmitted OSPFv3 LS Ack packets.

Operational mode

Use this command to disable the generation of debug messages related to OSPFv3 LS Ack packets.

monitor protocol ospfv3 disable packet ls-request

Disables the generation of debug messages related to OSPFv3 link-state request (LSR) packets.

```
monitor protocol ospfv3 [ process process-id ] disable packet ls-request [ [
detail | recv [ detail ] | send [ detail ] ]
```

Debug messages are disabled for OSPFv3 LSR packets at a medium level of detail.

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

detail

Disables detailed debugging of OSPFv3 LSR packets, both sent and received.

recv

Disables debugging of received OSPFv3 LSR packets.

detail

Disables detailed debugging of received OSPFv3 LSR packets.

send

Disables debugging of transmitted OSPFv3 LSR packets.

detail

Disables detailed debugging of transmitted OSPFv3 LSR packets.

Operational mode

Use this command to disable the generation of debug messages related to OSPFv3 LSR packets.

monitor protocol ospfv3 disable packet ls-update

Disables the generation of debug messages related to OSPFv3 link-state update (LSU) packets.

```
monitor protocol ospfv3 [ process process-id ] disable packet ls-update [ detail
| recv [ detail ] | send [ detail ] ]
```

Debug messages are disabled for OSPFv3 LSU packets at a medium level of detail.

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

detail

Disables detailed debugging of OSPFv3 LSU packets, both sent and received.

recv

Disables debugging of received OSPFv3 LSU packets.

detail

Disables detailed debugging of received OSPFv3 LSU packets.

send

Disables debugging of transmitted OSPFv3 LSU packets.

detail

Disables detailed debugging of transmitted OSPFv3 LSU packets.

Operational mode

Use this command to disable the generation of debug messages related to OSPFv3 LSU packets.

monitor protocol ospfv3 disable packet recv

Disables the generation of debug messages related to OSPFv3 received packets.

```
monitor protocol ospfv3 [ process process-id ] disable packet recv
```

Debug messages are disabled for OSPFv3 received packets.

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

Operational mode

Use this command to disable the generation of debug messages related to OSPFv3 received packets.

monitor protocol ospfv3 disable packet send

Disables the generation of debug messages related to OSPFv3 sent packets.

```
monitor protocol ospfv3 [ process process-id ] disable packet send
```

Debug messages are disabled for OSPFv3 sent packets.

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

Operational mode

Use this command to disable the generation of debug messages related to OSPFv3 sent packets.

monitor protocol ospfv3 disable retransmission

Disables the generation of debug messages related to OSPFv3 retransmission debugs.

```
monitor protocol ospfv3 [ process process-id ] disable retransmission
```

Debug messages are disabled for OSPFv3 retransmissions.

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

retransmission

Disables retransmission debugging messages related to OSPFv3.

Operational mode

Use this command to disable the generation of debug messages related to OSPFv3 retransmission debugs.

monitor protocol ospfv3 disable rib

Disables the generation of debug messages related to OSPFv3 RIB.

```
monitor protocol ospfv3 [ process process-id ] disable rib [ interface | redistribute ]
```

Debug messages are disabled for OSPFv3 RIB events.

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

rib

Disables OSPFv3 RIB debugging messages.

interface

Disables only OSPFv3 RIB interface debugging messages.

redistribute

Disables only OSPFv3 RIB redistribute debugging messages.

Operational mode

Use this command to disable the generation of debug messages related to OSPFv3 Routing Information Base (RIB).

monitor protocol ospfv3 disable route

Disables the generation of debug messages related to OSPFv3 route calculations.

```
monitor protocol ospfv3 [ process process-id ] disable route [ ase | ia | install | spf ]
```

Debug messages are disabled for OSPFv3 route calculations.

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

ase

Disables detailed debugging of OSPFv3 external route calculations.

ia

Disables detailed debugging of OSPFv3 inter-area route calculations.

install

Disables detailed debugging of OSPFv3 route installation.

spf

Disables detailed debugging of OSPFv3 Shortest Path First (SPF) calculation.

Operational mode

Use this command to disable the generation of debug messages related to OSPFv3 route calculations.

monitor protocol ospfv3 enable all

Enables the generation of all debug messages related to OSPFv3.

```
monitor protocol ospfv3 [ process process-id ] enable all
```

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

all

Enables all debug messages.

Operational mode

Use this command to enable the generation of all debug messages related to OSPFv3.

monitor protocol ospfv3 enable bfd

Enables the generation of debug messages related to OSPFv3 BFD events.

```
monitor protocol ospfv3 [ process process-id ] enable bfd
```

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

bfd

Enables debugging of BFD events.

Operational mode

Use this command to enable the generation of debug messages related to OSPFv3 Bidirectional Forwarding Detection (BFD) events.

monitor protocol ospfv3 enable events

Enables the generation of debug messages related to OSPFv3 events.

```
monitor protocol ospfv3 [ process process-id ] enable events [ abr | asbr | nssa
| os | router | vlink ]
```

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

abr

Enables debugging of Area Border Router (ABR) events.

asbr

Enables debugging of Autonomous System Boundary Router (ASBR) events.

nssa

Enables debugging of not-so-stubby area (NSSA) events.

os

Enables debugging of OS-interaction events.

router

Enables debugging of other router events.

vlink

Enables debugging of virtual-link events.

Operational mode

Use this command to enable the generation of debug messages related to OSPFv3 events.

monitor protocol ospfv3 enable ifsm

Enables the generation of debug messages related to OSPFv3 Interface Finite State Machine (IFSM) events.

```
monitor protocol ospfv3 [ process process-id ] enable ifsm [ events | status |
timers ]
```

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

events

Enables debugging of IFSM events.

status

Enables debugging of IFSM status information.

timers

Enables debugging of IFSM timer information.

Operational mode

Use this command to enable the generation of debug messages related to OSPFv3 IFSM events.

monitor protocol ospfv3 enable lsa

Enables the generation of debug messages related to OSPFv3 Link State Advertisements (LSAs).

```
monitor protocol ospfv3 [ process process-id ] enable lsa [ flooding | generate | install | maxage | refresh ]
```

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

flooding

Enables debugging of OSPFv3 LSA flood events.

generate

Enables debugging of OSPFv3 LSA generation.

install

Enables debugging of OSPFv3 LSA installation.

maxage

Enables debugging of maximum age processing related OSPFv3 LSA.

refresh

Enables debugging of OSPFv3 LSA refreshes.

Operational mode

Use this command to enable the generation of debug messages related to OSPFv3 LSAs.

monitor protocol ospfv3 enable nfsm

Enables the generation of debug messages related to OSPFv3 Neighbor Finite State Machines (NFSMs).

```
monitor protocol ospfv3 [ process process-id ] enable nfsm [ events | status | timers ]
```

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

events

Enables debugging of OSPFv3 NFSM events.

status

Enables debugging of OSPFv3 NFSM status.

timers

Enables debugging of OSPFv3 NFSM timers.

Operational mode

Use this command to enable the generation of debug messages related to OSPFv3 NFSM.

monitor protocol ospfv3 enable nsm

Enables the generation of debug messages related to OSPFv3 Network Services Module (NSM).

```
monitor protocol ospfv3 [ process process-id ] enable nsm interface
```

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

interface

Enables debugging of OSPFv3 NSM interface events.

Operational mode

Use this command to enable the generation of debug messages related to OSPFv3 NSM.

monitor protocol ospfv3 enable packet dd

Enables the generation of debug messages related to OSPFv3 Database Description (DD) packets.

```
monitor protocol ospfv3 [ process process-id ] enable packet dd [ detail | recv
[ detail ] | send [ detail ] ]
```

Debug messages are generated for OSPF DD packets at a medium level of detail.

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

detail

Enables detailed debugging of OSPFv3 DD packets, both sent and received.

recv

Enables debugging of received OSPFv3 DD packets.

detail

Enables detailed debugging of received OSPFv3 DD packets.

send

Enables debugging of transmitted OSPFv3 DD packets.

detail

Enables detailed debugging of transmitted OSPFv3 DD packets.

Operational mode

Use this command to enable the generation of debug messages related to OSPFv3 DD packets.

monitor protocol ospfv3 enable packet detail

Enables the generation of debug messages related to OSPFv3 detailed packets.

```
monitor protocol ospfv3 [ process process-id ] enable packet detail
```

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

Operational mode

Use this command to enable the generation of debug messages related to OSPFv3 detailed packets.

monitor protocol ospfv3 enable packet hello

Enables the generation of debug messages related to OSPFv3 Hello packets.

```
monitor protocol ospfv3 [ process process-id ] enable packet hello [ detail | recv [ detail ] | send [ detail ] ]
```

Debug messages are generated for OSPFv3 Hello packets at a medium level of detail.

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

detail

Enables detailed debugging of OSPFv3 Hello packets, both sent and received.

recv

Enables detailed debugging of received OSPFv3 Hello packets.

detail

Enables detailed debugging of received OSPFv3 Hello packets.

send

Enables debugging of transmitted OSPFv3 Hello packets.

detail

Enables detailed debugging of transmitted OSPFv3 Hello packets.

Operational mode

Use this command to enable the generation of debug messages related to OSPFv3 Hello packets.

monitor protocol ospfv3 enable packet ls-ack

Enables the generation of debug messages related to OSPFv3 link-state acknowledgment (LS Ack) packets.

```
monitor protocol ospfv3 [ process process-id ] enable packet ls-ack [ detail |
recv [ detail ] | send [ detail ] ]
```

Debug messages are generated for OSPFv3 LS Ack packets at a medium level of detail.

process process-id

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

detail

Enables detailed debugging of OSPFv3 LS Ack packets, both sent and received.

recv

Enables debugging of received OSPFv3 LS Ack packets.

detail

Enables detailed debugging of received OSPFv3 LS Ack packets.

send

Enables debugging of transmitted OSPFv3 LS Ack packets.

detail

Enables detailed debugging of transmitted OSPFv3 LS Ack packets.

Operational mode

Use this command to enable the generation of debug messages related to OSPFv3 LS Ack packets.

monitor protocol ospfv3 enable packet ls-request

Enables the generation of debug messages related to OSPFv3 link-state request (LSR) packets.

```
monitor protocol ospfv3 [ process process-id ] enable packet ls-request [ detail
| recv [ detail ] | send [ detail ] ]
```

Debug messages are generated for OSPFv3 LSR packets at a medium level of detail.

process process-id

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

detail

Enables detailed debugging of OSPFv3 LSR packets, both sent and received.

recv

Enables debugging of received OSPFv3 LSR packets.

detail

Enables detailed debugging of received OSPFv3 LSR packets.

send

Enables debugging of transmitted OSPFv3 LSR packets.

detail

Enables detailed debugging of transmitted OSPFv3 LSR packets.

Operational mode

Use this command to enable the generation of debug messages related to OSPFv3 LSR packets.

monitor protocol ospfv3 enable packet ls-update

Enables the generation of debug messages related to OSPFv3 link-state update (LSU) packets.

```
monitor protocol ospfv3 [ process process-id ] enable packet ls-update [ detail
| recv [ detail ] | send [ detail ] ]
```

Debug messages are generated for OSPFv3 LSU packets at a medium level of detail.

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

detail

Enables detailed debugging of OSPFv3 LSU packets, both sent and received.

recv

Enables debugging of received OSPFv3 LSU packets.

detail

Enables detailed debugging of received OSPFv3 LSU packets.

send

Enables debugging of transmitted OSPFv3 LSU packets.

detail

Enables detailed debugging of transmitted OSPFv3 LSU packets.

Operational mode

Use this command to enable the generation of debug messages related to OSPFv3 LSU packets.

monitor protocol ospfv3 enable packet recv

Enables the generation of debug messages related to OSPFv3 received packets.

```
monitor protocol ospfv3 [ process process-id ] enable packet recv
```

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

Operational mode

Use this command to enable the generation of debug messages related to OSPFv3 received packets.

monitor protocol ospfv3 enable packet send

Enables the generation of debug messages related to OSPFv3 sent packets.

```
monitor protocol ospfv3 [ process process-id ] enable packet send
```

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

Operational mode

Use this command to enable the generation of debug messages related to OSPFv3 sent packets.

monitor protocol ospfv3 enable retransmission

Enables the generation of debug messages related to OSPFv3 retransmission debugs.

```
monitor protocol ospfv3 [ process process-id ] enable retransmission
```

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

retransmission

Enables retransmission debugging messages related to OSPFv3.

Operational mode

Use this command to enable the generation of debug messages related to OSPFv3 retransmission debugs.

monitor protocol ospfv3 enable rib

Enables the generation of debug messages related to OSPFv3 RIB.

```
monitor protocol ospfv3 [ process process-id ] enable rib [ interface | redistribute ]
```

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

rib

Enables OSPFv3 RIB debugging messages.

interface

Enables only OSPFv3 RIB interface debugging messages.

redistribute

Enables only OSPFv3 RIB redistribute debugging messages.

Operational mode

Use this command to enable the generation of debug messages related to OSPFv3 Routing Information Base (RIB).

monitor protocol ospfv3 enable route

Enables the generation of debug messages related to OSPFv3 route calculations.

```
monitor protocol ospfv3 [ process process-id ] enable route [ ase | ia | install | spf ]
```

process *process-id*

Specifies the ID, which is a string of alphanumeric characters, of an OSPFv3 process.

ase

Enables detailed debugging of OSPFv3 external route calculations.

ia

Enables detailed debugging of OSPFv3 inter-area route calculations.

install

Enables detailed debugging of OSPFv3 route installation.

spf

Enables detailed debugging of OSPFv3 Shortest Path First (SPF) calculation.

Operational mode

Use this command to enable the generation of debug messages related to OSPFv3 route calculations.

protocols ospfv3 auto-cost reference-bandwidth

Sets the reference bandwidth method for calculating administrative cost.

```
set protocols ospfv3 [ process process-id ] auto-cost reference-bandwidth
bandwidth

delete protocols ospfv3 [ process process-id ] auto-cost reference-bandwidth

show protocols ospfv3 [ process process-id ] auto-cost reference-bandwidth
```

The default reference bandwidth is 100 Mbps.

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

bandwidth

The reference bandwidth rate in Mbps. The bandwidth ranges from 1 to 4294967.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      auto-cost
      {
        reference-bandwidth bandwidth
      }
    }
  }
}
```

Use this command to set a reference bandwidth for calculating OSPFv3 administrative cost. The OSPFv3 metric is calculated as the reference bandwidth divided by the actual bandwidth.

An explicitly set cost for an area overrides automatically calculated values.

Use the **set** form of this command to set the reference bandwidth method for calculating OSPFv3 administrative cost.

Use the **delete** form of this command to restore the default reference bandwidth.

Use the **show** form of this command to display the OSPFv3 auto-cost configuration.

protocols ospfv3 default-information originate

Generates a default external route into an OSPFv3 routing area.

```
set protocols ospfv3 [ process process-id ] default-information originate [
metric metric | metric-type type ]
```

```
delete protocols ospfv3 [ process process-id ] default-information originate [
metric | metric-type ]
```

```
show protocols ospfv3 [ process process-id ] default-information originate [
metric | metric-type ]
```

By default, the system does not generate a default external route into an OSPFv3 routing area. When enabled to do so, the default depends on the type of area into which the default route is being advertised:

- In stub areas, a Type 3 LSA is generated with a metric of 1 and the metric type is ignored.
- In not-so-stubby areas (NSSAs) configured to import summary advertisements, a Type 7 LSA with a metric of 1 and a metric type of 2 is generated.
- In NSSAs configured not to import summary advertisements, a Type 3 LSA with a metric of 1 and the metric type is ignored.

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

metric

The metric to be applied to the default route. The range is 0 to 16777214. The default is 1.

type

The external route metric type to be associated with the Type 5 default link-state advertisement (LSA). Supported values are as follows:

- 1:** Type 1 external route.
- 2:** Type 2 external route.

The default is 2.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      default-information {
        originate
        {
          metric metric
          metric-type type
        }
      }
    }
  }
}
```

Use this command to generate a default external route into an OSPFv3 routing area. The default route is redistributed into an OSPFv3 routing area.

If you redistribute routes in this way, the router automatically becomes an Autonomous System Boundary Router (ASBR). The router must have a default route configured before it can generate one, unless the **always** keyword is specified.

Use the `set` form of this command to generate a default external route into an OSPFv3 routing area.

Use the `delete` form of this command to disable the generation of a default external route into the OSPFv3 routing area or to restore default parameter values.

Use the `show` form of this command to display default route distribution configuration.

Note:

When extended IPv4 ACLs are used in a route map, the route must be specified in the source field of the ACL and the net mask of the route must be specified in the destination field of the ACL.

The inverse mask for the source field is applied to the prefix before the comparison with the source. The inverse mask for the destination field is applied to the net mask of the prefix before the comparison with the net mask as specified in the destination field.

Effectively, the prefix must match the source to the application of the inverse mask of the source field. And the net mask for the prefix must match the destination to the application of the inverse mask of the destination field.

protocols ospfv3 default-metric

Sets the default metric to be applied to routes from other protocols being redistributed into OSPFv3.

```
set protocols ospfv3 [ process process-id ] default-metric metric
```

```
delete protocols ospfv3 [ process process-id ] default-metric
```

```
show protocols ospfv3 [ process process-id ] default-metric
```

Built-in, automatic metric translations, as appropriate for each routing protocol.

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

metric

The metric to be applied to routes from other protocols being redistributed into OSPFv3. The metric ranges from 0 to 16777214.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
```

```

    default-metric metric
  }
}

```

Use this command to set the default metric to be applied to routes from other protocols being redistributed into OSPFv3.

Use the `set` form of this command to set the default OSPFv3 metric.

Use the `delete` form of this command to restore the default metric.

Use the `show` form of this command to display the OSPFv3 default metric configuration.

protocols ospfv3 distance

Sets the administrative distance for OSPFv3 routes.

```

set protocols ospfv3 [ process process-id ] distance [ global global | ospfv3 [
external external | inter-area inter | intra-area intra ] ]

```

```

delete protocols ospfv3 [ process process-id ] distance [ global global | ospfv3
[ external | inter-area | intra-area ] ]

```

```

show protocols ospfv3 [ process process-id ] distance [ global global | ospfv3 [
global global | ospfv3 [ external | inter-area | intra-area ] ]

```

The default administrative distance for OSPFv3 routes is 110.

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

global

The administrative distance for all routes. The distance ranges from 1 to 254.

external

The OSPFv3 administrative distance for external routes (routes learned from another protocol by redistribution). The distance ranges from 1 to 254. The default is 110.

inter

The OSPFv3 administrative distance for inter-area routes (routes to another area). The distance ranges from 1 to 254. The default distance is 110.

intra

The OSPFv3 administrative distance for intra-area routes (routes within an area). The distance ranges from 1 to 254. The default distance is 110.

Configuration mode

```

protocols {
  ospfv3 {

```

```

process process-id {
distance {
  global global
  ospfv3 {
    external external
    inter-area inter
    intra-area intra
  }
}
}
}
}

```

Use this command to set the administrative distance for OSPFv3 routes.

The administrative distance indicates the trustworthiness of a router or group of routers as a source of routing information. In general, the higher the distance, the less trusted the entity. An administrative distance of 1 usually represents a directly connected network, and an administrative distance of 255 means the routing source is unreliable or unknown. The administrative distance conventionally applied to OSPFv3 is 110.

Use the `set` form of this command to set the administrative distance for OSPFv3 routes.

Use the `delete` form of this command to restore the default administrative distance.

Use the `show` form of this command to display the administrative distance configuration.

protocols ospfv3 distribute-list

Specifies the OSPFv3 access list used to filter networks in routing updates.

```

set protocols ospfv3 distribute-list name [ export type | import ]
delete protocols ospfv3 distribute-list name [ export type | import ]
show protocols ospfv3 distribute-list name

```

name

The name of the access list that is used to filter networks in routing updates.

export type

The type of export routes to filter. Possible values include: `bgp`, `connected`, `kernel`, `rip`, or `static`. Multiple types can be specified by creating additional `export` configuration nodes.

import

The filter for incoming routing updates.

Configuration mode

```

protocols {

```

```
ospfv3 {
  distribute-list name{
    export type
    import
  }
}
}
```

Use this command to specify an access list to filter networks in routing updates.

Use the `set` form of this command to specify an access list.

Use the `delete` form of this command to remove an access list.

Use the `show` form of this command to display the configuration.

protocols ospfv3 log

Enables OSPFv3 protocol logs.

```
set protocols ospfv3 log { all | bfd | events | ifsm | lsa | nfsm | nsm | packet
| retransmission | rib | route }
```

```
delete protocols ospfv3 log { all | bfd | events | ifsm | lsa | nfsm | nsm |
packet | retransmission | rib | route }
```

```
show protocols ospfv3 log { all | bfd | events | ifsm | lsa | nfsm | nsm |
packet | retransmission | rib | route }
```

None

all

Enables all OSPFv3 logs.

bfd

Enables only OSPFv3 BFD logs

events

Enables only OSPFv3 event logs.

ifsm

Enables only OSPFv3 IFSM logs.

lsa

Enables only OSPFv3 LSA logs.

nfsm

Enables only OSPFv3 NFSM logs.

nsm

Enables only OSPFv3 NSM logs.

packet

Enables only OSPFv3 packet logs.

retransmission

Enables only OSPFv3 retransmission logs.

rib

Enables only OSPFv3 RIB logs.

route

Enables only OSPFv3 route logs.

Configuration mode

```

protocols {
  ospfv3 {
    log {
      all
      bfd
      events
      ifsm
      lsa
      nfsm
      nsm
      packet
      retransmission
      rib
      route
    }
  }
}

```

Use the `set` form of this command to enable Open Shortest Path First (OSPF)v3 logs.

Use the `delete` form of this command to remove OSPFv3 logs.

Use the `show` form of this command to view OSPFv3 logs.

.

protocols ospfv3 log events

Enables OSPFv3 event logs.

```

set protocols ospfv3 log events { abr | all | asbr | lsa | nssa | os | router |
vlink }

```

```

delete protocols ospfv3 log events { abr | all | asbr | lsa | nssa | os | router
| vlink }

```

```

show protocols ospfv3 log events { abr | all | asbr | lsa | nssa | os | router |
vlink }

```

None

abr

Enables OSPFv3 event ABR logs.

all

Enables all OSPFv3 event logs

asbr

Enables only OSPFv3 event ASBR logs.

lsa

Enables only OSPFv3 event LSA logs.

nssa

Enables only OSPFv3 event NSSA logs.

os

Enables only OSPFv3 event OS logs.

router

Enables only OSPFv3 event router logs.

vlink

Enables only OSPFv3 event vlink logs.

Configuration mode

```

protocols {
  ospfv3 {
    log {
      events {
        abr
        all
        asbr
        lsa
        nssa
        os
        router
        vlink
      }
    }
  }
}

```

Use the `set` form of this command to enable Open Shortest Path First (OSPF) event logs.

Use the `delete` form of this command to remove OSPFv3 event logs.

Use the `show` form of this command to view OSPFv3 event logs.

protocols ospfv3 log ifsm

Enables OSPFv3 IFSM logs.

```
set protocols ospfv3 log ifsm { all | events | staus | timers }
delete protocols ospfv3 log ifsm { all | events | staus | timers }
show protocols ospfv3 log ifsm { all | events | staus | timers }
```

None

all

Enables all OSPFv3 IFSM logs.

events

Enables only OSPFv3 IFSM event logs.

status

Enables only OSPFv3 IFSM status logs.

timers

Enables only OSPFv3 IFSM timer logs.

Configuration mode

```
protocols {
  ospfv3 {
    log {
      ifsm {
        all
        events
        status
        timers
      }
    }
  }
}
```

Use the `set` form of this command to enable Open Shortest Path First (OSPF) interface finite-state machine (IFSM) logs.

Use the `delete` form of this command to remove OSPFv3 IFSM logs.

Use the `show` form of this command to view OSPFv3 IFSM logs.

protocols ospfv3 log lsa

Enables OSPFv3 LSA logs.

```
set protocols ospfv3 log lsa { all | flooding | generate | install | maxage |
refresh }
```

```
delete protocols ospfv3 log lsa { all | flooding | generate | install | maxage |
refresh }
```

```
show protocols ospfv3 log lsa { all | flooding | generate | install | maxage |
refresh }
```

None

all

Enables all OSPFv3 LSA logs.

flooding

Enables only OSPFv3 LSA flooding logs.

generate

Enables only OSPFv3 LSA generation logs.

install

Enables only OSPFv3 LSA installation logs.

maxage

Enables only OSPFv3 LSA maximum age logs.

refresh

Enables only OSPFv3 LSA refresh logs.

Configuration mode

```
protocols {
  ospfv3 {
    log {
      lsa {
        all
        flooding
        generate
        install
        maxage
        refresh
      }
    }
  }
}
```

Use the `set` form of this command to enable Open Shortest Path First (OSPF)v3 LSA logs.

Use the `delete` form of this command to remove OSPFv3 LSA logs.

Use the `show` form of this command to view OSPFv3 LSA logs.

protocols ospfv3 log nfsm

Enables OSPFv3 NFSM logs.

```
set protocols ospfv3 log nfsm { all | events | status | timers }
delete protocols ospfv3 log nfsm { all | events | status | timers }
show protocols ospfv3 log nfsm { all | events | status | timers }
```

None

all

Enables all OSPFv3 NFSM logs.

events

Enables only OSPFv3 NFSM event logs.

status

Enables only OSPFv3 NFSM status logs.

timers

Enables only OSPFv3 NFSM timers logs.

Configuration mode

```
protocols {
  ospfv3 {
    log {
      nfsm {
        all
        events
        status
        timers
      }
    }
  }
}
```

Use the `set` form of this command to enable Open Shortest Path First (OSPF)v3 neighbor FSM (NFSM) logs.

Use the `delete` form of this command to remove OSPFv3 NFSM logs.

Use the `show` form of this command to view OSPFv3 NFSM logs.

protocols ospfv3 log nsm

Enables OSPFv3 NSM logs.

```

set protocols ospfv3 nsm { all | interface | redistribute }
delete protocols ospfv3 nsm { all | interface | redistribute }
show protocols ospfv3 nsm { all | interface | redistribute }

```

None

all

Enables all OSPF NSM logs.

interface

Enables only OSPF interface logs.

redistribute

Enables only OSPF redistribute logs.

Configuration mode

```

protocols {
  ospfv3 {
    log {
      nsm {
        all
        interface
        redistribute
      }
    }
  }
}

```

Use the `set` form of this command to enable Open Shortest Path First v3 (OSPFv3) network services module (NSM) log.

Use the `delete` form of this command to remove an OSPFv3 NSM log.

Use the `show` form of this command to remove an OSPFv3 NSM log.

protocols ospfv3 log packet

Enables OSPFv3 packet logs.

```

set protocols ospfv3 log packet { all | dd | detail | hello | ls-ack | ls-request
| ls-update | rcv | send }

delete protocols ospfv3 log packet { all | dd | detail | hello | ls-ack | ls-
request | ls-update | rcv | send }

show protocols ospfv3 log packet { all | dd | detail | hello | ls-ack | ls-
request | ls-update | rcv | send }

```

NOne

all

Enables all OSPFv3 packet logs.

dd

Enables only OSPFv3 packet DD logs.

detail

Enables only OSPFv3 packet detail logs.

hello

Enables only OSPFv3 packet hello logs.

ls-ack

Enables only OSPFv3 packet ls-ack logs.

ls-request

Enables only OSPFv3 packet ls-request logs.

ls-update

Enables only OSPFv3 packet ls-update logs.

recv

Enables only OSPFv3 packet receive logs.

send

Enables only OSPFv3 packet send logs.

Configuration mode

```

protocols {
  ospfv3 {
    log {
      packet {
        all
        dd
        detail
        hello
        ls-ack
        ls-request
        ls-update
        recv
        send
      }
    }
  }
}

```

Use the `set` form of this command to enable Open Shortest Path First (OSPF)v3 packet logs.

Use the `delete` form of this command to remove OSPFv3 packet logs.

Use the `show` form of this command to view OSPFv3 packet logs.

protocols ospfv3 log rib

Enables OSPFv3 RIB logs.

```
set protocols ospfv3 log rib { all | interface | redistribute }
delete protocols ospfv3 log rib { all | interface | redistribute }
show protocols ospfv3 log rib { all | interface | redistribute }
```

None

all

Enables all OSPFv3 RIB logs.

interface

Enables only OSPFv3 RIB interface logs.

redistribute

Enables only OSPFv3 RIB redistribute logs.

Configuration mode

```
protocols {
  ospfv3 {
    log {
      rib {
        all
        interface
        redistribute
      }
    }
  }
}
```

Use the `set` form of this command to enable OSPFv3 RIB logs.

Use the `delete` form of this command to remove OSPFv3 RIB logs.

Use the `show` form of this command to view OSPFv3 RIB logs.

protocols ospfv3 log route

Enables OSPFv3 route logs.

```
set protocols ospfv3 log route { all | ase | ia | install | spf }
```

```
delete protocols ospfv3 log route { all | ase | ia | install | spf }
show protocols ospfv3 log route { all | ase | ia | install | spf }
```

None

all

Enables all OSPFv3 route all logs.

ase

Enables only OSPFv3 route ASE logs.

ia

Enables only OSPFv3 route IA logs.

install

Enables only OSPFv3 route install logs.

SPF

Enables only OSPFv3 route SPF logs.

Configuration mode

```
protocols {
  ospf {
    log {
      route {
        all
        ase
        ia
        install
        spf
      }
    }
  }
}
```

Use the `set` form of this command to enable OSPFv3 route logs.

Use the `delete` form of this command to remove OSPFv3 route logs.

Use the `show` form of this command to view OSPFv3 route logs.

protocols ospfv3 passive-interface

Suppresses routing updates on an interface.

Use this command to specify suppression for OSPFv3 routing updates on all interfaces (using default) or a specific interface. OSPFv3 traffic can be received on the interface but it will not be sent on it.

```

set protocols ospfv3 [ process process-id ] passive-interface { default |
interface }

delete protocols ospfv3 [ process process-id ] passive-interface { default |
interface }

show protocols ospfv3 [ process process-id ] passive-interface

```

Routing updates are not suppressed.

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

default

Routing updates are to be suppressed on all interfaces by default.

interface

The identifier of an interface. Supported interface types are:

- Data plane
- Loopback

For more information about these interface types, refer to [Supported Interface Types](#).

You may suppress routing updates on a per-interface basis.

Configuration mode

```

protocols {
  ospfv3 {
    process process-id {
      passive-interface [default | interface]
    }
  }
}

```

Use the `set` form of this command to suppress routing updates for an interface.

Use the `delete` form of this command to remove routing update suppression.

Use the `show` form of this command to display routing update suppression configuration.

protocols ospfv3 passive-interface-exclude

Excludes the suppression of the OSPFv3 routing updates on an interface.

```

set protocols ospf passive-interface-exclude interface

delete protocols ospf passive-interface-exclude interface

show protocols ospf passive-interface-exclude

```

Routing updates are not suppressed and `passive-interface` is configured.

```
protocols {
  ospfv3 {
    passive-interface-exclude interface
  }
}
```

interface

The identifier of an interface. Supported interface types are:

- Data plane
- Loopback

For more information about these interface types, refer to [Supported Interface Types](#).

You can exclude the suppression of routing updates on multiple interfaces by creating multiple **passive-interface-exclude** configuration nodes.

Configuration mode

Use this command to exclude the suppression of OSPFv3 routing updates on an interface. OSPFv3 traffic can be neither received on the interface nor sent through the interface.

Use the `set` form of this command to exclude the suppression of OSPFv3 routing updates on an interface.

Use the `delete` form of this command to restore the default behavior, that is, routing updates are not suppressed.

Use the `show` form of this command to display the suppression configuration of OSPFv3 routing updates.

The following example shows how to exclude the suppression of OSPF routing update on the 10.11.121.134 interface.

```
vyatta@Rn# set protocols ospf passive-interface-exclude 10.11.121.134
vyatta@R6# show protocols ospfv3
ospf {
  passive-interface-exclude 10.11.121.134
}
```

protocols ospfv3 process address-family ipv4 unicast

Configures IPv4 unicast addresses for OSPFv3 per address-family mode.

```
set protocols ospfv3 process process-id address-family ipv4 unicast
```

```
delete protocols ospfv3 process process-id address-family ipv4 unicast
```

```
show protocols ospfv3 process process-id address-family ipv4 unicast
```

process-id

An OSPFv3 process ID.

Configuration mode

```
protocols {
  ospfv3 {
    process-id process-id {
      address-family {
        ipv4 {
          unicast {
          }
        }
      }
    }
  }
}
```

This command allows you to enter address family mode in which you can configure IPv4 unicast addresses for OSPFv3, which includes the following tasks:

- Summarize intra-area IPv4 routes (see [protocols ospfv3 process address-family ipv4 unicast area range](#)).
- Create a default external route (see [protocols ospfv3 process address-family ipv4 unicast default-information originate](#)).
- Redistribute IPv4 routes (see [protocols ospfv3 process address-family ipv4 unicast redistribute](#)).
- Summarize IPv4 external routes (see [protocols ospfv3 process address-family ipv4 unicast summary-address](#)).

RFC 5838 defines the range of the following instance IDs to use for each address family in OSPFv3.

Table 2.

Instance ID#	Address Family
0 - 31	IPv6 unicast
64 - 95	IPv4 unicast

Multiple router processes can be configured on each interface. Each instance ID creates a separate OSPFv3 instance with its own neighbor adjacencies, link state database, and SPF computation. You must configure at least two instances: one base and one named instance, of which each must be configured with a different address family.

 **Note:** The router does not support running a single IPv4 or IPv6 OSPFv3 process on multiple instances on the same interface.

Use the `set` form of this command to enter address family mode in which you can configure IPv4 unicast addresses for OSPFv3.

Use the `delete` form of this command to remove the IPv4 address family configuration for OSPFv3.

Use the `show` form of this command to display the IPv4 unicast addresses for OSPFv3.

protocols ospfv3 process address-family ipv4 unicast area range

Configures a range of OSPFv3 addresses.

```
set protocols ospfv3 process process-id address-family ipv4 unicast area area-id range { ipv4net | ipv6net } [ advertise | not-advertise ]
```

```
delete protocols ospfv3 process process-id address-family ipv4 unicast area area-id range { ipv4net | ipv6net } [ advertise | not-advertise ]
```

```
show protocols ospfv3 process process-id address-family ipv4 unicast area area-id range { ipv4net | ipv6net } [ advertise | not-advertise ]
```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

area-id

The ID of an OSPFv3 area being configured, expressed as an IP address or a decimal value. The decimal value ranges from 0 to 4294967295.

ipv4net

A range to be summarized, expressed as an IPv4 network in the format *ipv4-address/prefix*.

ipv6net

A range to be summarized, expressed as an IPv6 network in the format *ipv6-address/prefix*.

advertise

Advertises this range.

not-advertise

Does not advertise this range. Directs the router not to advertise routes in this range.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      address-family {
        ipv4 {
```



```
delete protocols ospfv3 [ process pid ] address-family ipv4 unicast area area-id
range ipv6net metric 0..16777214
```

```
show protocols ospfv3 [ process pid ] address-family ipv4 unicast area area-id
range ipv6net metric
```

process pid

The PID of an IPv6 OSPF process.

area-id

The ID of the OSPF area being configured, expressed as an IP address or a decimal value.

ipv6net

A range to summarize, expressed as an IPv6 network in the format *ipv4-address/prefix*.

0..16777214

A fixed cost to advertise along with the summary route.

Configuration mode

```
protocols {
  ospfv3 {
    process pid {
      address-family {
        ipv4 {
          unicast {
            area area-id {
              area-type {
                range {
                  metric
                }
              }
            }
          }
        }
      }
    }
  }
}
```

Use the `set` form of this command to set the metric.

Use the `delete` form of this command to remove the metric.

Use the `show` form of this command to display the metric.

protocols ospfv3 process address-family ipv4 unicast default-information originate

Generates a default external route into an OSPFv3 routing area.

```
set protocols ospfv3 process process-id address-family ipv4 unicast default-
information originate [ always | metric metric | metric-type type | route-map
map-name ]
```

```
delete protocols ospfv3 process process-id address-family ipv4 unicast default-
information originate [ always | metric | metric-type | route-map ]
```

```
show protocols ospfv3 process process-id address-family ipv4 unicast default-
information originate [ always | metric | metric-type | route-map ]
```

By default, the system does not generate a default external route into an OSPFv3 routing area.

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

always

Advertises the default route regardless of whether there is a default route.

metric

The OSPFv3 address-family metric to be applied to the default route. The range is 0 to 16777214. The default is 1.

type

The OSPFv3 metric type for address-family default routes. Supported values are as follows:

1: Type 1 external route.

2: Type 2 external route.

The default is 2.

map-name

A route map for which routes are redistributed.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      address-family {
        ipv4 unicast {
          default-information {
            originate {
              always
              metric metric
              metric-type type
              route-map map-name
            }
          }
        }
      }
    }
  }
}
```



```
delete protocols ospfv3 process process-id address-family ipv4 unicast
redistribute [ bgp | connected | kernel | rip | static ] [ metric metric |
metric-type type route-map map-name ]
```

```
show protocols ospfv3 process process-id address-family ipv4 unicast
redistribute [ bgp | connected | kernel | rip | static ] [ metric metric |
metric-type type route-map map-name ]
```

By default, only the IPv6 unicast address family is supported. Support for IPv4 unicast may be configured using this command.

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

bgp

Specifies BGP routes.

connected

Specifies connected routes.

kernel

Specifies kernel routes.

static

Specifies static routes.

rip

Specifies Routing Information Protocol (RIP) routes.

metric

The OSPFv3 address-family metric to be applied to the default route. The range is 0 to 16777214. The default is 1.

type

The OSPFv3 metric type for address-family default routes. Supported values are as follows:

1: Type 1 external route.

2: Type 2 external route.

The default is 2.

map-name

A route map for which routes are redistributed.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      address-family {
        ipv4 unicast {
          redistribute {
            bgp {
```



```
set protocols ospfv3 process process-id address-family ipv4 unicast redistribute
bgp [ metric metric | metric-type type | route-map map-name ]
```

```
delete protocols ospfv3 process process-id address-family ipv4 unicast
redistribute bgp [ metric metric | metric-type type | route-map map-name ]
```

```
show protocols ospfv3 process process-id address-family ipv4 unicast
redistribute bgp [ metric metric | metric-type type | route-map map-name ]
```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

metric

The OSPFv3 address-family metric to be applied to the default route. The range is 0 to 16777214. The default is 1.

type

The OSPFv3 metric type for address-family default routes. Supported values are as follows:

1: Type 1 external route.

2: Type 2 external route.

The default is 2.

map-name

A route map for which routes are redistributed.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      address-family {
        ipv4 unicast {
          redistribute {
            bgp {
              metric metric
              metric-type type
              route-map map-name
            }
          }
        }
      }
    }
  }
}
```

Use this command to define the parameters for redistribution of BGP routes into OSPFv3.

 **Note:** This command applies to IPv4 unicast routes only.

Use the `set` form of this command to set BGP route redistribution parameters.

Use the `delete` form of this command to remove BGP route redistribution parameters.
Use the `show` form of this command to display BGP route redistribution configuration.

Note:

When extended IPv4 ACLs are used in a route map, the route must be specified in the source field of the ACL and the net mask of the route must be specified in the destination field of the ACL.

The inverse mask for the source field is applied to the prefix before the comparison with the source. The inverse mask for the destination field is applied to the net mask of the prefix before the comparison with the net mask as specified in the destination field.

Effectively, the prefix must match the source to the application of the inverse mask of the source field. And the net mask for the prefix must match the destination to the application of the inverse mask of the destination field.

protocols ospfv3 process address-family ipv4 unicast redistribute connected

Sets the parameters for redistribution of connected routes into OSPFv3.

```
set protocols ospfv3 process process-id address-family ipv4 unicast redistribute
connected [ metric metric | metric-type type | route-map map-name ]

delete protocols ospfv3 process process-id address-family ipv4 unicast
redistribute connected [ metric | metric-type | route-map ]

show protocols ospfv3 process process-id address-family ipv4 unicast
redistribute connected [ metric metric | metric-type type | route-map map-name
]
```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

metric

The OSPFv3 address-family metric to be applied to the default route. The range is 0 to 16777214. The default is 1.

type

The OSPFv3 metric type for address-family default routes. Supported values are as follows:

1: Type 1 external route.

2: Type 2 external route.

The default is 2.

map-name

A route map for which routes are redistributed.

Configuration mode

```

protocols {
  ospfv3 {
    process process-id {
      address-family {
        ipv4 unicast {
          redistribute {
            connected {
              metric metric
              metric-type type
              route-map map-name
            }
          }
        }
      }
    }
  }
}

```

Use this command to specify the parameters for redistribution of connected routes into OSPFv3.

 **Note:** This command applies to IPv4 unicast routes only.

Use the **set** form of this command to set connected route redistribution parameters.

Use the **delete** form of this command to remove connected route redistribution parameters.

Use the **show** form of this command to display connected route redistribution configuration.

 **Note:**

When extended IPv4 ACLs are used in a route map, the route must be specified in the source field of the ACL and the net mask of the route must be specified in the destination field of the ACL.

The inverse mask for the source field is applied to the prefix before the comparison with the source. The inverse mask for the destination field is applied to the net mask of the prefix before the comparison with the net mask as specified in the destination field.

Effectively, the prefix must match the source to the application of the inverse mask of the source field. And the net mask for the prefix must match the destination to the application of the inverse mask of the destination field.

protocols ospfv3 process address-family ipv4 unicast redistribute kernel

Sets the parameters for redistribution of kernel routes into OSPFv3.

```

set protocols ospfv3 process process-id address-family ipv4 unicast redistribute
kernel [ metric metric | metric-type type | route-map map-name ]

```

```

delete protocols ospfv3 process process-id address-family ipv4 unicast
redistribute kernel [ metric metric | metric-type type | route-map map-name ]

show protocols ospfv3 process process-id address-family ipv4 unicast
redistribute kernel [ metric metric | metric-type type | route-map map-name ]

```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

metric

The OSPFv3 address-family metric to be applied to the default route. The range is 0 to 16777214. The default is 1.

type

The OSPFv3 metric type for address-family default routes. Supported values are as follows:

- 1: Type 1 external route.
- 2: Type 2 external route.

The default is 2.

map-name

A route map for which routes are redistributed.

Configuration mode

```

protocols {
  ospfv3 {
    process process-id {
      address-family {
        ipv4 unicast {
          redistribute {
            kernel {
              metric metric
              metric-type type
              route-map map-name
            }
          }
        }
      }
    }
  }
}

```

Use this command to specify the parameters for redistribution of kernel routes into OSPFv3.

 **Note:** This command applies to IPv4 unicast routes only.

Use the `set` form of this command to set kernel route redistribution parameters.

Use the `delete` form of this command to remove kernel route redistribution parameters.

Use the `show` form of this command to display kernel route redistribution configuration.

Note:

When extended IPv4 ACLs are used in a route map, the route must be specified in the source field of the ACL and the net mask of the route must be specified in the destination field of the ACL.

The inverse mask for the source field is applied to the prefix before the comparison with the source. The inverse mask for the destination field is applied to the net mask of the prefix before the comparison with the net mask as specified in the destination field.

Effectively, the prefix must match the source to the application of the inverse mask of the source field. And the net mask for the prefix must match the destination to the application of the inverse mask of the destination field.

protocols ospfv3 process address-family ipv4 unicast redistribute rip

Sets the parameters for redistribution of Routing Information Protocol (RIP) routes into OSPFv3.

```
set protocols ospfv3 process process-id address-family ipv4 unicast redistribute
rip [ metric metric | metric-type type | route-map map-name ]
```

```
delete protocols ospfv3 process process-id address-family ipv4 unicast
redistribute rip [ metric | metric-type | route-map ]
```

```
show protocols ospfv3 process process-id address-family ipv4 unicast
redistribute rip [ metric | metric-type | route-map ]
```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

ipv4net

A range to be summarized, expressed as an IPv4 network in the format *ipv4-address/prefix*.

metric

The OSPFv3 address-family metric to be applied to the default route. The range is 0 to 16777214. The default is 1.

type

The OSPFv3 metric type for address-family default routes. Supported values are as follows:

1: Type 1 external route.

2: Type 2 external route.

The default is 2.

map-name

A route map for which routes are redistributed.

Configuration mode

```

protocols {
  ospfv3 {
    process process-id {
      address-family {
        ipv4 unicast {
          redistribute {
            rip {
              metric metric
              metric-type type
              route-map map-name
            }
          }
        }
      }
    }
  }
}

```

Use this command to specify the parameters for redistribution of RIP routes into OSPFv3.

 **Note:** This command applies to IPv4 unicast routes only.

Use the `set` form of this command to set the RIP route redistribution parameters.

Use the `delete` form of this command to remove RIP route redistribution parameters.

Use the `show` form of this command to display RIP route redistribution configuration.

 **Note:**

When extended IPv4 ACLs are used in a route map, the route must be specified in the source field of the ACL and the net mask of the route must be specified in the destination field of the ACL.

The inverse mask for the source field is applied to the prefix before the comparison with the source. The inverse mask for the destination field is applied to the net mask of the prefix before the comparison with the net mask as specified in the destination field.

Effectively, the prefix must match the source to the application of the inverse mask of the source field. And the net mask for the prefix must match the destination to the application of the inverse mask of the destination field.

protocols ospfv3 process address-family ipv4 unicast redistribute static

Sets the parameters for redistribution of static routes into OSPFv3.

```

set protocols ospfv3 process process-id address-family ipv4 unicast redistribute
static [ metric metric | metric-type type | route-map map-name ]

```

```

delete protocols ospfv3 process process-id address-family ipv4 unicast
redistribute static [ metric metric | metric-type type | route-map map-name ]

show protocols ospfv3 process process-id address-family ipv4 unicast
redistribute static [ metric metric | metric-type type | route-map map-name ]

```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

metric

The OSPFv3 address-family metric to be applied to the default route. The range is 0 to 16777214. The default is 1.

type

The OSPFv3 metric type for address-family default routes. Supported values are as follows:

- 1: Type 1 external route.
- 2: Type 2 external route.

The default is 2.

map-name

A route map for which routes are redistributed.

Configuration mode

```

protocols {
  ospfv3 {
    process process-id {
      address-family {
        ipv4 unicast {
          redistribute {
            static {
              metric metric
              metric-type type
              route-map map-name
            }
          }
        }
      }
    }
  }
}

```

Use this command to specify the parameters for redistribution of static routes into OSPFv3.

 **Note:** This command applies to IPv4 unicast routes only.

Use the `set` form of this command to set the static route redistribution parameters.

Use the `delete` form of this command to remove the static route redistribution parameters.

Use the `show` form of this command to display the configuration of the static route redistribution.

Note:

When extended IPv4 ACLs are used in a route map, the route must be specified in the source field of the ACL and the net mask of the route must be specified in the destination field of the ACL.

The inverse mask for the source field is applied to the prefix before the comparison with the source. The inverse mask for the destination field is applied to the net mask of the prefix before the comparison with the net mask as specified in the destination field.

Effectively, the prefix must match the source to the application of the inverse mask of the source field. And the net mask for the prefix must match the destination to the application of the inverse mask of the destination field.

protocols ospfv3 process address-family ipv4 unicast summary-address

Summarizes or suppresses external routes with a specified address range.

```
set protocols ospfv3 process process-id address-family ipv4 unicast summary-address { ipv6net | ipv4net } [ non-advertise | tag tag-value ]
```

```
delete protocols ospfv3 process process-id address-family ipv4 unicast summary-address { ipv6net | ipv4net }
```

```
show protocols ospfv3 process process-id address-family ipv4 unicast summary-address { ipv6net | ipv4net }
```

Routing updates are not suppressed.

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

ipv6net

A range to be summarized, expressed as an IPv6 network in the format *ipv6-address/prefix*.

not-advertise

Suppresses routes that match a range.

tag-value

Tag value to use as a “match” value for controlling redistribution via route maps. Set a tag value. The tag value ranges from 0 to 4294967295. The default is 0.

Configuration mode

```
protocols {
  ospfv3 {
```

```

process process-id {
  address-family {
    ipv4 {
      unicast {
        summary-address {
          ipv4net {
            non-advertise
            tag tag-value}
          ipv6net {
            non-advertise
            tag tag-value}
        }
      }
    }
  }
}

```

Use this command to summarize or suppress external routes with a specified address range.

 **Note:** This command applies to IPv4 unicast routes only.

Use the **set** form of this command to summarize or suppress external routes with a specified address range.

Use the **delete** form of this command to remove summary addresses.

Use the **show** form of this command to display summary-addresses configuration.

protocols ospfv3 process passive-interface-exclude

Excludes the suppression of OSPFv3 routing updates on an interface that belongs to the OSPF process.

```
set protocols ospfv3 process [ process process-id ] passive-interface-exclude
interface
```

```
delete protocols ospfv3 process [ process process-id ] passive-interface-exclude
interface
```

```
show protocols ospfv3 process [ process process-id ] passive-interface-exclude
```

Routing updates are not suppressed and `passive-interface` is configured.

interface

The identifier of an interface. Supported interface types are:

- Data plane
- Loopback

For more information about these interface types, refer to [Supported Interface Types](#).

You can exclude the suppression of routing updates on multiple interfaces by creating multiple **passive-interface-exclude** configuration nodes.

Configuration Mode

```
protocols {
  ospfv3 {
    process process-id {
      passive-interface-exclude interface
    }
  }
}
```

Use this command to exclude the suppression of OSPFv3 routing updates on an interface that belongs to the OSPFv3 process. OSPFv3 traffic can be neither received on the interface nor sent through the interface that belongs to the OSPFv3 process.

Use the `set` form of this command to exclude the suppression of OSPFv3 routing updates on an interface that belongs to the OSPFv3 process.

Use the `delete` form of this command to restore the default behavior, that is, routing updates are not suppressed..

Use the `show` form of this command to display the suppression configuration of OSPFv3 routing updates.

The following example shows how to exclude the OSPFv3 routing update suppression on 10.11.121.134 interface.

```
vyatta@Rn# set protocols ospf passive-interface-exclude 10.11.121.134 that
  belong to an OSPF process with process ID as 12.
vyatta@R6# show protocols ospfv3 process 12
ospf {
  process 12
  {
    passive-interface-exclude 10.11.121.134
  }
}
```

protocols ospfv3 redistribute bgp

Sets the parameters for redistribution of Border Gateway Protocol (BGP) routes into OSPFv3.

```
set protocols ospfv3 [ process process-id ] redistribute bgp [ metric metric |
metric-type type | route-map map-name | tag tag-value ]
```

```
delete protocols ospfv3 [ process process-id ] redistribute bgp [ metric |
metric-type | route-map | tag ]
```

```
show protocols ospfv3 [ process process-id ] redistribute bgp [ metric | metric-
type | route-map | tag ]
```

Connected routes being redistributed into OSPFv3 are assigned a routing metric of 1 and a metric-type of 2. By default, no route map is applied to redistributed connected routes. The default tag value is 0.

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

metric

The specified metric to connected routes being redistributed into OSPFv3. The range is 1 to 16. The default is 1.

type

The type of calculated cost. Supported values are 1 (internal cost is added to external cost) and 2 (only external cost is used). The default is 2.

map-name

A route map for which routes are redistributed.

tag-value

Tag value to use as a “match” value for controlling redistribution via route maps. Set a tag value. The tag value ranges from 0 to 2147483647. The default is 0.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      redistribute {
        bgp {
          metric metric
          metric-type type
          route-map map-name
          tag tag-value
        }
      }
    }
  }
}
```

Use this command to define the parameters for redistribution of BGP routes into OSPFv3.

Use the `set` form of this command to set BGP route redistribution parameters.

Use the `delete` form of this command to remove BGP route redistribution parameters.

Use the `show` form of this command to display BGP route redistribution configuration.

protocols ospfv3 redistribute connected

Sets the parameters for redistribution of connected routes into OSPFv3.

```
set protocols ospfv3 [ process process-id ] redistribute connected [ metric
metric | metric-type type | route-map map-name ]
```

```
delete protocols ospfv3 [ process process-id ] redistribute connected [ metric |
metric-type | route-map ]
```

```
show protocols ospfv3 [ process process-id ] redistribute connected [ metric |
metric-type | route-map ]
```

Connected routes being redistributed into OSPFv3 are assigned a routing metric of 1 and a metric-type of 2. By default, no route map is applied to redistributed connected routes.

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

metric

The specified metric to connected routes being redistributed into OSPFv3. The range is 1 to 16. The default is 1.

type

The type of calculated cost. Supported values are 1 (internal cost is added to external cost) and 2 (only external cost is used). The default is 2.

map-name

A route map for which routes are redistributed.

Configuration mode

```
protocols {
  ospfv3 {
    process {
      redistribute {
        connected {
          metric
          metric-type
          route-map map
        }
      }
    }
  }
}
```

Use the `set` form of this command to set connected route redistribution parameters.

Use the `delete` form of this command to remove connected route redistribution parameters.

Use the `show` form of this command to display connected route redistribution configuration.

protocols ospfv3 redistribute kernel

Sets the parameter for redistribution of kernel routes into OSPFv3.

```
set protocols ospfv3 [ process process-id ] redistribute kernel [ metric metric
| metric-type type | route-map map-name ]
```

```
delete protocols ospfv3 [ process process-id ] redistribute kernel [ metric |
metric-type | route-map ]
```

```
show protocols ospfv3 [ process process-id ] redistribute kernel [ metric |
metric-type | route-map ]
```

By default, no route map is applied to redistributed kernel routes.

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

metric

The specified metric to connected routes being redistributed into OSPFv3. The range is 1 to 16. The default is 1.

type

The type of calculated cost. Supported values are 1 (internal cost is added to external cost) and 2 (only external cost is used). The default is 2.

map-name

A route map for which routes are redistributed.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      redistribute {
        kernel {
          metric metric
          metric-type type
          route-map map-name
        }
      }
    }
  }
}
```

Use this command to specify the parameter for redistribution of kernel routes into OSPFv3.

Use the **set** form of this command to set kernel route redistribution parameters.

Use the **delete** form of this command to remove kernel route redistribution parameters.

Use the **show** form of this command to display kernel route redistribution configuration.

protocols ospfv3 redistribute rip

Sets the parameters for redistribution of RIP next generation (RIPng) routes into OSPFv3.

```
set protocols ospfv3 [ process process-id ] redistribute rip [ metric metric |
metric-type type | route-map map-name ]
```

```
delete protocols ospfv3 [ process process-id ] redistribute rip [ metric |
metric-type | route-map ]
```

```
show protocols ospfv3 [ process process-id ] redistribute rip [ metric | metric-
type | route-map ]
```

RIP routes being redistributed into OSPFv3 are assigned a routing metric of 1 and a metric-type of 2. By default, no route map is applied to redistributed RIP routes.

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

metric

The specified metric to connected routes being redistributed into OSPFv3. The range is 1 to 16. The default is 1.

type

The type of calculated cost. Supported values are 1 (internal cost is added to external cost) and 2 (only external cost is used). The default is 2.

map-name

A route map for which routes are redistributed.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      redistribute {
        rip {
          metric metric
          metric-type type
          route-map map-name
        }
      }
    }
  }
}
```

Use this command to specify the parameter for redistribution of RIPng routes into OSPFv3.

Use the **set** form of this command to set the RIPng route redistribution parameters.

Use the **delete** form of this command to remove RIPng route redistribution parameters.

Use the **show** form of this command to display RIPng route redistribution configuration.

protocols ospfv3 redistribute static

Specifies the parameters for redistribution of static routes into OSPFv3.

```
set protocols ospfv3 [ process process-id ] redistribute static [ metric metric
| metric-type type | route-map map-name ]
```

```
delete protocols ospfv3 [ process process-id ] redistribute static [ metric |
metric-type | route-map ]
```

```
show protocols ospfv3 [ process process-id ] redistribute static [ metric |
metric-type | route-map ]
```

Static routes being redistributed into OSPFv3 are assigned a routing metric of 1 and a metric-type of 2. By default, no route map is applied to redistributed static routes.

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

metric

The specified metric to connected routes being redistributed into OSPFv3. The range is 1 to 16. The default is 1.

type

The type of calculated cost. Supported values are 1 (internal cost is added to external cost) and 2 (only external cost is used). The default is 2.

map-name

Redistributes routes that satisfy the specified route map.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      redistribute {
        static
        {
          metric metric
          metric-type type
          route-map map-name
        }
      }
    }
  }
}
```

Use this command to specify the parameters for redistribution of static routes into OSPFv3.

Use the **set** form of this command to set the static route redistribution parameters.

Use the **delete** form of this command to remove static route redistribution parameters.

Use the **show** form of this command to display static route redistribution configuration.

protocols ospfv3 router-id

Specifies a router identifier (ID) for an OSPFv3 process.

If no router ID is explicitly configured, the OSPF3 process calculates an ID for the router by using the following algorithm:

1. Use the IP address of the loopback interface.
2. Use the highest IP address of the addresses on router interfaces.
3. If no interfaces are defined, use 0.0.0.0.

Configure each router with a unique router-id. In an OSPFv3 router process that has active neighbors, a new router-id is used at the next reload or when you start the OSPFv3 manually.

 **Note:** The minimal requirement for a functioning OSPFv3 setup is to configure both the **protocols ospfv3 router-id** <router-id> command and the **protocols ospfv3 area** <area-id> command. Thereafter, you must commit the configuration.

```
set protocols ospfv3 [ process process-id ] router-id router-id
```

```
delete protocols ospfv3 [ process process-id ] router-id router-id
```

```
show protocols ospfv3 [ process process-id ] router-id router-id
```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

router-id

The router ID for an OSPFv3 process. This ID overrides the router ID calculated by the OSPFv3 process. The format is an IPv4 address.

CAUTION:

Modifying the router ID causes the router to restart.

Configuration mode

```
protocols {
  ospfv3 {
    process {
      router-id
    }
  }
}
```

Use the **set** form of this command to specify a router ID for an OSPFv3 process.

Use the **delete** form of this command to restore defaults for the router ID.

Use the **show** form of this command to display the router ID for an OSPFv3 process.

protocols ospfv3 summary-address

Summarizes or suppresses external routes with a specified address range.

```
set protocols ospfv3 [ process process-id ] summary-address { ipv6net | ipv4net
} [ not-advertise | advertise tag tag-value ]
```

```
delete protocols ospfv3 [ process process-id ] summary-address { ipv6net |
ipv4net } [ not-advertise | advertise tag tag-value ]
```

```
show protocols ospfv3 [ process process-id ] summary-address { ipv6net | ipv4net
} [ not-advertise | advertise tag tag-value ]
```

Routing updates are not suppressed.

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

ipv6net

A range of addresses given as IPv6 starting address and a mask.

ipv4net

A range of addresses given as IPv4 starting address and a mask.

not-advertise

Suppresses routes that match a range.

tag-value

Tag value to use as a “match” value for controlling redistribution via route maps. Set a tag value. The tag value ranges from 0 to 4294967295. The default is 0.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      summary-address
      ipv4net {
        not-advertise
        advertise tag tag-value}
      ipv6net {
        not-advertise
        advertise tag tag-value}
    }
  }
}
```

Use this command to summarize or suppress external routes with a specified address range.

An address range is a pairing of a starting address and a mask that is almost the same as IP network number. For example:

- If the specified IPV6 address range is 2020:100:100:2000::/53, it matches 2020:100:100:2222::/64, 2020:100:100:2666::/64 and so on.
- If the specified IPV4 address range is 192.168.0.0/255.255.240.0, it matches 192.168.1.0/24, 192.168.4.0/22, 192.168.8.128/25 and so on.

Redistributing routes from other protocols into OSPFv3 requires the router to advertise each route individually in an external LSA. Use this command to advertise one summary route for all redistributed routes covered by a specified network address and mask. This minimizes the size of the OSPFv3 link state database.

Use the **set** form of this command to summarize or suppress external routes with a specified address range.

Use the **delete** form of this command to remove summary addresses.

Use the **show** form of this command to display summary-addresses configuration.

show ipv6 ospfv3

Displays high-level information about OSPFv3 configuration.

```
show ipv6 ospfv3 [ process-id ]
```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

Operational mode

Use this command to display high-level information about OSPFv3 configuration.

show ipv6 ospfv3 database

Displays OSPFv3 database information.

```
show ipv6 ospfv3 [ process-id ] database [ adv-router | external | inter-prefix  
| inter-router | intra-prefix | link | max-age | network | nssa-external |  
router | self-originate ] [ ipv4 | [ adv-router ipv4 | self-originate ]
```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

external

Displays information for the Autonomous System (AS) external LSAs within the OSPFv3 Link State database. For more information, see [show ipv6 ospfv3 database external](#).

inter-prefix

Displays information for the Inter-Prefix LSAs within the OSPFv3 Link State database. For more information, see [show ipv6 ospfv3 database inter-prefix](#).

inter-router

Displays information for the Inter-Router LSAs within the OSPFv3 Link State database. For more information, see [show ipv6 ospfv3 database inter-router](#).

intra-prefix

Displays information for the Intra-Prefix LSAs within the OSPFv3 Link State database. For more information, see [show ipv6 ospfv3 database intra-prefix](#).

link

Displays information for the Link LSAs within the OSPFv3 Link State database. For more information, see [show ipv6 ospfv3 database link](#).

max-age

Displays information for the MaxAge LSAs within the OSPFv3 Link State database. For more information, see [show ipv6 ospfv3 database max-age](#).

network

Displays information for the Network LSAs within the OSPFv3 Link State database. For more information, see [show ipv6 ospfv3 database network](#).

nssa-external

Displays information for the not-so-stubby-area (NSSA) LSAs within the OSPFv3 Link State database. For more information, see [show ipv6 ospfv3 database nssa-external](#).

router

Displays information for the Router LSAs within the OSPFv3 Link State database. For more information, see [show ipv6 ospfv3 database router](#).

ipv4

Display the OSPFv3 database for a given address.

adv-router *ipv4*

Display the OSPFv3 database for a given address of the advertised router specified.

self-originate

Displays information for the self-originated link states within the OSPFv3 Link State database. For more information, see [show ipv6 ospfv3 database self-originate](#).

Operational mode

Use this command to display the OSPFv3 database information.

show ipv6 ospfv3 database adv-router

Displays information for the advertising router within the OSPFv3 Link State database.

```
show ipv6 ospfv3 [ process-id ] database adv-router ipv4
```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

ipv4

The Router ID of the advertising router. Specify an IP address.

Operational mode

Use this command to display information relating to the advertising router in the OSPFv3 Link State database.

show ipv6 ospfv3 database external

Displays information for the Autonomous System (AS) external LSAs within the OSPFv3 Link State database.

```
show ipv6 ospfv3 [ process-id ] database external [ ipv4 [ [ adv-router ipv4 ] | [ self-originate ] ] | adv-router ipv4 | self-originate ]
```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

ipv4

The Link State ID. Display the OSPFv3 database for a given address.

adv-router ipv4

Display the OSPFv3 database for a given address of the specified advertised router.

self-originate

Display the self-originate OSPFv3 database for a given address.

Operational mode

Use this command to display information for the Autonomous System (AS) external LSAs within the OSPFv3 Link State database.

show ipv6 ospfv3 database inter-prefix

Displays information for the Inter-Prefix LSAs within the OSPFv3 Link State database.

```
show ipv6 ospfv3 [ process-id ] database inter-prefix [ ipv4 [ [ adv-router ipv4 ] | [ self-originate ] ] | adv-router ipv4 | self-originate ]
```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

ipv4

The Link State ID. Display the OSPFv3 database for a given address.

adv-router *ipv4*

Display the OSPFv3 database for a given address of the specified advertised router.

self-originate

Display the self-originate OSPFv3 database for a given address.

Operational mode

Use this command to display information for Inter-Prefix LSAs within the OSPFv3 Link State database.

show ipv6 ospfv3 database inter-router

Displays information for the Inter-Router LSAs within the OSPFv3 Link State database.

```
show ipv6 ospfv3 [ process-id ] database inter-router [ ipv4 [ [ adv-router
ipv4 ] | [ self-originate ] ] | adv-router ipv4 | self-originate ]
```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

ipv4

The Link State ID. Display the OSPFv3 database for a given address.

adv-router *ipv4*

Display the OSPFv3 database for a given address of the specified advertised router.

self-originate

Display the self-originate OSPFv3 database for a given address.

Operational mode

Use this command to display information for Inter-Router LSAs within the OSPFv3 Link State database.

show ipv6 ospfv3 database intra-prefix

Displays information for the Intra-Prefix LSAs within the OSPFv3 Link State database.

```
show ipv6 ospfv3 [ process-id ] database intra-prefix [ ipv4 [ [ adv-router
ipv4 ] | [ self-originate ] ] | adv-router ipv4 | self-originate ]
```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

ipv4

The Link State ID. Display the OSPFv3 database for a given address.

adv-router *ipv4*

Display the OSPFv3 database for a given address of the specified advertised router.

self-originate

Display the self-originate OSPFv3 database for a given address.

Operational mode

Use this command to display information for Intra-Prefix LSAs within the OSPFv3 Link State database.

show ipv6 ospfv3 database link

Displays information for the Link LSAs within the OSPFv3 Link State database.

```
show ipv6 ospfv3 [ process-id ] database link [ ipv4 [ [ adv-router ipv4 ] | [ self-originate ] ] | adv-router ipv4 | self-originate ]
```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

ipv4

The Link State ID. Display the OSPFv3 database for a given address.

adv-router *ipv4*

Display the OSPFv3 database for a given address of the specified advertised router.

self-originate

Display the self-originate OSPFv3 database for a given address.

Operational mode

Use this command to display information for Link LSAs within the OSPFv3 Link State database.

show ipv6 ospfv3 database max-age

Displays information for the MaxAge LSAs within the OSPFv3 Link State database.

```
show ipv6 ospfv3 [ process-id ] database max-age
```

Operational mode

Use this command to display information for MaxAge LSAs within the OSPFv3 Link State database.

show ipv6 ospfv3 database network

Displays information for the Network LSAs within the OSPFv3 Link State database.

```
show ipv6 ospfv3 [ process-id ] database network [ ipv4 [ [ adv-router ipv4 ] |
[ self-originate ] ] | adv-router ipv4 | self-originate ]
```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

ipv4

The Link State ID. Display the OSPFv3 database for a given address.

adv-router ipv4

Display the OSPFv3 database for a given address of the specified advertised router.

self-originate

Display the self-originate OSPFv3 database for a given address.

Operational mode

Use this command to display information for Network LSAs within the OSPFv3 Link State database.

show ipv6 ospfv3 database nssa-external

Displays information for the not-so-stubby-area (NSSA) LSAs within the OSPFv3 Link State database.

```
show ipv6 ospfv3 [ process-id ] database nssa-external [ ipv4 [ [ adv-router
ipv4 ] | [ self-originate ] ] | adv-router ipv4 | self-originate ]
```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

ipv4

The Link State ID. Display the OSPFv3 database for a given address.

adv-router ipv4

Display the OSPFv3 database for a given address of the specified advertised router.

self-originate

Display the self-originate OSPFv3 database for a given address.

Operational mode

Use this command to display information for NSSA LSAs within the OSPFv3 Link State database.

show ipv6 ospfv3 database router

Displays information for the router LSAs within the OSPFv3 Link State database.

```
show ipv6 ospfv3 [ process-id ] database router [ ipv4 [ [ adv-router ipv4 ] |
[ self-originate ] ] | adv-router ipv4 | self-originate ]
```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

ipv4

The Link State ID. Display the OSPFv3 database for a given address.

adv-router ipv4

Display the OSPFv3 database for a given address of the specified advertised router.

self-originate

Display the self-originate OSPFv3 database for a given address.

Operational mode

Use this command to display information for Router LSAs within the OSPFv3 Link State database.

show ipv6 ospfv3 database self-originate

Displays information for the self-originated link states within the OSPFv3 Link State database.

```
show ipv6 ospfv3 [ process-id ] database self-originate
```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

Operational mode

Use this command to display information for the self-originated link states within the OSPFv3 Link State database.

show ipv6 ospfv3 interface

Displays OSPFv3 configuration and status information for a specified interface.

```
show ipv6 ospfv3 interface [ interface ]
```

If no interfaces are specified then information on all interfaces is displayed.

interface

The identifier of an interface. Supported interface types are:

- Data plane
- Loopback

For more information about these interface types, refer to [Supported Interface Types](#).

Operational mode

Use this command to display information about OSPFv3 configuration for an interface.

show ipv6 ospfv3 neighbor

Displays OSPFv3 neighbor information for a specified address or interface.

```
show ipv6 ospfv3 [ process-id ] neighbor [ ipv4 | detail | / | interface ]
```

If no interfaces are specified, then information on all neighbors is displayed.

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

ipv4

Display neighbor information for the specified address.

detail

Display detailed neighbor information for all neighbors.

interface

The identifier of an interface. Supported interface types are:

- Data plane
- Loopback

For more information about these interface types, refer to [Supported Interface Types](#).

Operational mode

Use this command to display OSPFv3 neighbor information for a specified address or interface.

show ipv6 ospfv3 route

Displays OSPFv3 route information.

```
show ipv6 ospfv3 [ process-id ] route
```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

Operational mode

Use this command to display the OSPFv3 route information.

show ip ospfv3 routing-instance

Displays the mapping between routing instance and OSPFv3 process and identifies which processes are running in a given routing instance.

```
show ip ospfv3 routing instance { all | default | instance-name }
```

Operational mode

Use this command to identify the routing instance that a given process runs in.

The following example displays the mapping between each routing instance and OSPFv3 process.

```
vyatta@vyatta:~$ show ip ospfv3 routing-instance all
OSPFv3 processes bound to routing-instance GREEN:
None
OSPFv3 processes bound to routing-instance BLUE:
OSPF process id:100
OSPFv3 processes bound to routing-instance default:
OSPF process id:0
vyatta@vyatta:~$
```

show ipv6 ospfv3 topology

Displays information about OSPFv3 topology for all areas or a specified area.

```
show ipv6 ospfv3 [ process-id ] topology [ area area-id ]
```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

area-id

The ID of an OSPFv3 area being configured, expressed as an IP address or a decimal value. The decimal value ranges from 0 to 4294967295.

Operational mode

Use this command to display information about OSPFv3 topology for all areas or a specified area.

show ipv6 ospfv3 virtual-links

Displays information about OSPFv3 virtual links.

```
show ipv6 ospfv3 [ process-id ] virtual-links
```

process-id

An OSPFv3 process ID. Enter alphanumeric characters.

Operational mode

Use this command to display information about OSPFv3 virtual links.

show ipv6 route ospfv3

Displays all IPv6 OSPFv3 routes.

```
show ipv6 route ospfv3
```

Operational mode

Use this command to display all the IPv6 OSPFv3 routes.

show monitoring protocols ospfv3

Displays OSPFv3 protocol debugging flags.

```
show monitoring protocols ospfv3
```

Operational mode

Use this command to display OSPFv3 protocol debugging flags. This command allows you to see how debugging is set for OSPFv3.

Chapter 6. OSPFv3 Area Commands

protocols ospfv3 area

Defines an OSPFv3 area within an Autonomous System (AS).

```
set protocols ospfv3 [ process process-id ] area area-id
delete protocols ospfv3 [ process process-id ] area area-id
show protocols ospfv3 [ process process-id ] area area-id
```

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

area-id

The ID of an OSPFv3 area being configured, expressed as an IP address or a decimal value. The decimal value ranges from 0 to 4294967.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      area area-id
    }
  }
}
```

Use this command to define an area within an OSPFv3 AS.

Use the **set** form of this command to create an OSPFv3 area or define the parameters for a specified OSPFv3 area.

Use the **delete** form of this command to remove an OSPFv3 area.

Use the **show** form of this command to display the OSPFv3 area configuration.

protocols ospfv3 area nssa

Designates an OSPFv3 area as a not-so-stubby area (NSSA).

Use this command to designate an OSPFv3 area as an NSSA. There are no external routes in an OSPFv3 stub area. Therefore you cannot redistribute from another protocol into a stub area. An NSSA allows external routes to be flooded within the area. These routes are then leaked into other areas. However, the external routes from other areas still do not enter the NSSA. You can configure an area to be a stub area or an NSSA, but not both.

This command simplifies administration when connecting a central site that is using OSPFv3 to a remote site that is using a different routing protocol. You can extend OSPFv3 to cover the remote connection by defining the area between the central router and the remote router as an NSSA.

Type 5 AS-external LSAs are not allowed in stubby areas. Type 7 LSAs may be translated into Type 5 LSAs by the NSSA Area Border Router (ABR) and may traverse the NSSA in this manner. Inter-area routes are not allowed.

```
set protocols ospfv3 [ process process-id ] area area-id nssa
delete protocols ospfv3 [ process process-id ] area area-id nssa
show protocols ospfv3 [ process process-id ] area area-id nssa
```

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

area-id

The ID of an OSPFv3 area being configured, expressed as an IP address or a decimal value. The decimal value ranges from 0 to 4294967.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      area area-id {
        nssa
      }
    }
  }
}
```

Use the **set** form of this command to designate an OSPFv3 area as an NSSA.

Use the **delete** form of this command to remove an NSSA designation.

Use the **show** form of this command to display an NSSA configuration.

protocols ospfv3 area nssa default-cost

Sets the administrative cost, or metric, to be applied to the OSPFv3 not-so-stubby-area (NSSA).

```
set protocols ospfv3 [ process process-id ] area area-id nssa default-cost cost
delete protocols ospfv3 [ process process-id ] area area-id nssa default-cost
show protocols ospfv3 [ process process-id ] area area-id nssa default-cost
```

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

area-id

The ID of an OSPFv3 area being configured, expressed as an IP address or a decimal value. The decimal value ranges from 0 to 4294967.

cost

The administrative cost, or metric, that is applied to an NSSA. The range is 0 to 6777215. The default is 1.

Configuration mode

```

protocols {
  ospfv3 {
    process process-id {
      area area-id {
        nssa {
          default-cost cost
        }
      }
    }
  }
}

```

Use this command to set the administrative cost or metric to be applied to the OSPFv3 NSSA.

Use the **set** form of this command to set the administrative cost or metric to be applied to the OSPFv3 NSSA.

Use the **delete** form of this command to remove the area type configuration.

Use the **show** form of this command to display the area type configuration.

protocols ospfv3 area nssa default-information-originate

Sets a default external route into an OSPFv3 routing area.

```
set protocols ospfv3 [ process process-id ] area area-id nssa default-
information-originate
```

```
delete protocols ospfv3 [ process process-id ] area area-id nssa default-
information-originate
```

```
show protocols ospfv3 [ process process-id ] area area-id nssa default-
information-originate
```

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

area-id

The ID of an OSPFv3 area being configured, expressed as an IP address or a decimal value. The decimal value ranges from 0 to 4294967.

Configuration mode

```

protocols {
  ospfv3 {
    process process-id {
      area area-id {
        nssa {
          default-information-originate
        }
      }
    }
  }
}

```

Use this command to set a default external route into an OSPFv3 routing area.

Use the **set** form of this command to set a default external route into an OSPFv3 routing area.

Use the **delete** form of this command to remove the area type configuration.

Use the **show** form of this command to display the area type configuration.

protocols ospfv3 area nssa default-information-originate metric

Sets an OSPFv3 default metric into an OSPFv3 routing area.

```
set protocols ospfv3 [ process process-id ] area area-id nssa default-
information-originate metric
```

```
delete protocols ospfv3 [ process process-id ] area area-id nssa default-
information-originate metric
```

```
show protocols ospfv3 [ process process-id ] area area-id nssa default-
information-originate metric
```

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

area-id

The ID of an OSPFv3 area being configured, expressed as an IP address or a decimal value. The decimal value ranges from 0 to 4294967.

Configuration mode

```

protocols {
  ospfv3 {
    process process-id {
      area area-id {
        nssa {
          default-information-originate metric
        }
      }
    }
  }
}

```

Use this command to set an OSPFv3 default metric into an OSPFv3 routing area.

Use the **set** form of this command to set an OSPFv3 default metric into an OSPFv3 routing area.

Use the **delete** form of this command to remove the area type configuration.

Use the **show** form of this command to display the area type configuration.

protocols ospfv3 area nssa default-information-originate metric-type

Sets an OSPFv3 metric type for default routes.

```

set protocols ospfv3 [ process process-id ] area area-id nssa default-
information-originate metric-type

```

```

delete protocols ospfv3 [ process process-id ] area area-id nssa default-
information-originate metric-type

```

```

show protocols ospfv3 [ process process-id ] area area-id nssa default-
information-originate metric-type

```

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

area-id

The ID of an OSPFv3 area being configured, expressed as an IP address or a decimal value. The decimal value ranges from 0 to 4294967.

Configuration mode

```

protocols {
  ospfv3 {
    process process-id {
      area area-id {
        nssa {

```

```

        default-information-originate metric-type
    }
}
}
}
}

```

Use this command to set an OSPFv3 metric type for default routes.

Use the **set** form of this command to set OSPFv3 metric type for default routes.

Use the **delete** form of this command to remove the area type configuration.

Use the **show** form of this command to display the area type configuration.

protocols ospfv3 area nssa no-redistribution

Configures a not-so-stubby-area (NSSA) router to disallow redistributed link-state advertisement (LSA) from entering an NSSA.

```
set protocols ospfv3 [ process process-id ] area area-id nssa no-redistribution
```

```
delete protocols ospfv3 [ process process-id ] area area-id nssa no-  
redistribution
```

```
show protocols ospfv3 [ process process-id ] area area-id nssa no-redistribution
```

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

area-id

The ID of an OSPFv3 area being configured, expressed as an IP address or a decimal value. The decimal value ranges from 0 to 4294967.

Configuration mode

```

protocols {
  ospfv3 {
    process process-id {
      area area-id {
        nssa {
          no-redistribution
        }
      }
    }
  }
}
}
}

```

Use this command to configure an NSSA router to disallow redistributed LSAs from entering the NSSA. Use this command when the router is both an NSSA Autonomous System Boundary Router (ASBR) and an NSSA Area Border Router (ABR).

Use the **set** form of this command to configure an NSSA router to disallow redistributed LSAs from entering the NSSA.

Use the **delete** form of this command to remove the area type configuration.

Use the **show** form of this command to display the area type configuration.

protocols ospfv3 area nssa no-summary

Configures OSPFv3 so that inter-area routes are not injected into a not-so-stubby-area (NSSA).

```
set protocols ospfv3 [ process process-id ] area area-id nssa no-summary
```

```
delete protocols ospfv3 [ process process-id ] area area-id nssa no-summary
```

```
show protocols ospfv3 [ process process-id ] area area-id nssa no-summary
```

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

area-id

The ID of an OSPFv3 area being configured, expressed as an IP address or a decimal value. The decimal value ranges from 0 to 4294967.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      area area-id {
        nssa {
          no-summary
        }
      }
    }
  }
}
```

Use this command to configure OSPFv3 so that inter-area routes are not injected into an NSSA. This command prevents route summaries from being generated into the area.

Use the **set** form of this command to configure OSPFv3 so that inter-area routes are not injected into an NSSA.

Use the **delete** form of this command to remove the area type configuration.

Use the **show** form of this command to display the area type configuration.

protocols ospfv3 area nssa stability-interval

Configures a stability timer for a not-so-stubby-area (NSSA).

```
set protocols ospfv3 [ process process-id ] area area-id nssa stability-interval
interval
```

```
delete protocols ospfv3 [ process process-id ] area area-id nssa stability-
interval
```

```
show protocols ospfv3 [ process process-id ] area area-id nssa stability-
interval
```

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

area-id

The ID of an OSPFv3 area being configured, expressed as an IP address or a decimal value. The decimal value ranges from 0 to 4294967.

interval

Stability interval in seconds. The range is from 0 to 2147483647.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      area area-id {
        nssa {
          stability-interval interval
        }
      }
    }
  }
}
```

Use this command to configure a stability timer for an NSSA. If an elected translator determines its services are no longer required, it continues to perform its duties for this time interval. This minimizes excess flushing of translated Type-7 LSAs and provides a more stable translator transition.

Use the **set** form of this command to configure a stability timer for an NSSA.

Use the **delete** form of this command to remove the area type configuration.

Use the **show** form of this command to display the area type configuration.

protocols ospfv3 area nssa translator-role

Specifies the translator role of the not-so-stubby-area (NSSA) Area Border Router (ABR) router in a NSSA.

```
set protocols ospfv3 [ process process-id ] area area-id nssa translator-role {
always | candidate }
```

```
delete protocols ospfv3 [ process process-id ] area area-id nssa translator-role
{ always | candidate }
```

```
show protocols ospfv3 [ process process-id ] area area-id nssa translator-role
```

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

area-id

The ID of an OSPFv3 area being configured, expressed as an IP address or a decimal value. The decimal value ranges from 0 to 4294967.

always

The NSSA-ABR translator role of always. This role allows the NSSA-ABR router to translate Type 7 link-state advertisements (LSAs) into Type 5 LSAs.

candidate

The NSSA-ABR translator role of candidate. This role allows the NSSA-ABR router to translate Type 7 LSAs into Type 5 LSAs, if a router is elected.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      area area-id {
        nssa {
          translator-role always
          translator-role candidate
        }
      }
    }
  }
}
```

Use this command to specify the translator role of an NSSA-ABR router in an NSSA.

Use the **set** form of this command to specify the translator role of an NSSA-ABR router in an NSSA.

Use the **delete** form of this command to remove the area type configuration.

Use the **show** form of this command to display the area type configuration.

protocols ospfv3 area range

Configures an OSPFv3 address range.

```
set protocols ospfv3 [ process process-id ] area area-id range { ipv6net } [
advertise | not-advertise ]
```

```
delete protocols ospfv3 [ process process-id ] area area-id range { ipv6net } [
advertise | not-advertise ]
```

```
show protocols ospfv3 [ process process-id ] area area-id range { ipv6net } [
advertise | not-advertise ]
```

By default, routes are advertised and routes are not substituted.

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

area-id

The ID of an OSPFv3 area being configured, expressed as an IP address or a decimal value. The decimal value ranges from 0 to 4294967.

ipv6net

The range to be summarized, expressed as an IPv6 network in the format *ipv6-address/prefix*.

advertise

Advertise this range.

not-advertise

Do not advertise this range. Directs the router not to advertise routes in this range.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      area area-id {
        range {
          ipv6net {
            advertise
            not-advertise
          }
        }
      }
    }
  }
}
```

Use this command to configure an OSPFv3 address range. This command summarizes intra-area routes for an Area Border Router (ABR). Use this command only with an ABR.

The `range` parameter cannot co-exist with NSSA stub or virtual-link configuration if configured in the same area. This means the **range** parameter can be used only if the area type is normal (or unspecified, because normal is the default type), not stub or NSSA. In addition, the **range** parameter cannot be used within an area that is configured as a virtual link.

The single summary route is then advertised to other areas by the ABRs. Routing information is condensed at area boundaries and outside the area. If the network numbers in an area are assigned in a way such that they are contiguous, the ABRs can be configured to advertise a summary route that covers all the individual networks within the area that fall into the specified range.

Use the `set` form of this command to direct the router to summarize routes matching a prefix range.

Use the `delete` form of this command to remove the assigned area range.

Use the `show` form of this command to display area-range configuration.

protocols ospfv3 area range metric

Overrides the default cost metric calculated to be the maximum metric among the prefixes that match the range. The metric is a fixed cost to advertise along with the summary route. If a metric is not specified, the cost of the summary route is the maximum cost of all the individual routes that are in the summary route. The cost is meaningless and ignored if `not-advertise` is configured for the specified range. This feature applies to inter-AS summary routes (configured through the area range command). It does not apply to external routes that are redistributed into OSPF.

```
set protocols ospfv3 [ process pid ] area area-id range ipv6net metric
0..16777214
```

```
delete protocols ospfv3 [ process pid ] area area-id range ipv6net metric
0..16777214
```

```
show protocols ospfv3 [ process pid ] area area-id range ipv6net metric
```

process pid

The PID of an IPv6 OSPF process.

area-id

The ID of the OSPF area being configured, expressed as an IP address or a decimal value.

ipv6net

A range to summarize, expressed as an IPv6 network in the format `ipv6-address/prefix`.

0..16777214

A fixed cost to advertise along with the summary route.

Configuration mode

```

protocols {
    ospfv3 {
        process pid {
            area area-id {
                area-type {
                    range {
                        metric
                    }
                }
            }
        }
    }
}

```

Use the `set` form of this command to set the metric.

Use the `delete` form of this command to remove the metric.

Use the `show` form of this command to display the metric.

protocols ospfv3 area stub

Designates an OSPFv3 area as a stub area.

```

set protocols ospfv3 [ process process-id ] area area-id stub [ default-cost
cost | no-summary ]

```

```

delete protocols ospfv3 [ process process-id ] area area-id stub [ default-cost
| no-summary ]

```

```

show protocols ospfv3 [ process process-id ] area area-id stub [ default-cost |
no-summary ]

```

By default, summary routes are generated into the area.

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

area-id

The ID of an OSPFv3 area being configured, expressed as an IP address or a decimal value.

cost

The administrative cost, or metric, that is applied to the default route in this area. The range is 0 to 6777215.

no-summary

Prevents route summaries from being generated into the area.

Configuration mode

```

protocols {
  ospfv3 {
    process process-id {
      area area-id {
        stub {
          default-cost cost
          no-summary
        }
      }
    }
  }
}

```

Use this command to designate an OSPFv3 area as a stub area. No Type 5 Autonomous System (AS)-external link-state advertisement (LSAs) are allowed into a stub area.

Use the `set` form of this command to set the OSPFv3 area type to a stub area.

Use the `delete` form of this command to remove area type configuration.

Use the `show` form of this command to display an area type configuration.

protocols ospfv3 area virtual-link

Configures a link between two backbone areas that are physically separated through other non-backbone areas.

```
set protocols ospfv3 [ process process-id ] area area-id virtual-link router-id
```

```
delete protocols ospfv3 [ process process-id ] area area-id virtual-link router-id
```

```
show protocols ospfv3 [ process process-id ] area area-id virtual-link router-id
```

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

area-id

The ID of an OSPFv3 area being configured, expressed as an IP address or a decimal value.

router-id

The router ID for an OSPFv3 process. The format is an IPv4 address.

Configuration mode

```

protocols {
  ospfv3 {
    process process-id {

```

```

area area-id {
  virtual-link router-id {
  }
}
}
}
}
}

```

Use this command to configure a link between two backbone areas that are physically separated through other non-backbone areas.

In OSPFv3, all non-backbone areas must be connected to a backbone area. If the connection to the backbone is lost, the virtual link repairs the connection. You can configure virtual links between any two backbone routers that have an interface to a common non-backbone area. The protocol treats these two routers joined by a virtual link as if they were connected by an unnumbered point-to-point network.

Use the **set** form of this command to configure a link between two backbone areas that are physically separated through other non-backbone areas.

Use the **delete** form of this command to remove the virtual link.

Use the **show** form of this command to display virtual-link configuration.

protocols ospfv3 area virtual-link dead-interval

Specifies the dead interval for a virtual link.

```

set protocols ospfv3 [ process process-id ] area area-id virtual-link router-id
dead-interval interval

```

```

delete protocols ospfv3 [ process process-id ] area area-id virtual-link router-id
dead-interval

```

```

show protocols ospfv3 [ process process-id ] area area-id virtual-link router-id
dead-interval

```

The dead interval is 40 seconds.

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

area-id

The ID of an OSPFv3 area being configured, expressed as an IP address or a decimal value.

router-id

The router ID for an OSPFv3 process. The format is an IPv4 address.

interval

An interval in seconds during which the virtual link should wait to detect Hello packets from neighboring routers before declaring the neighbor down. The range is from 1 to 65535. The default is 40 seconds.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      area area-id {
        virtual-link router-id {
          dead-interval interval
        }
      }
    }
  }
}
```

Use this command to specify the interval during which a virtual link should expect a hello packet from its neighbor.

If the dead interval passes without the interface receiving a hello packet from the neighbor, the status of the neighbor is changed to out-of-service, and all associated state is cleared.

The dead interval must be the same for all routers that are to establish two-way communication within a network. If two routers do not agree on these parameters, they do not establish adjacencies and disregard communication from each other.

 **Note:** Ensure that you do not set a dead interval that is too short in seconds. Otherwise, the configuration may end up declaring the virtual link prematurely down and may end up partitioning the backbone.

Use the `set` form of this command to specify the dead interval for a virtual link.

Use the `delete` form of this command to restore a deal interval of 40 seconds.

Use the `show` form of this command to display dead-interval configuration.

protocols ospfv3 area virtual-link hello-interval

Sets the interval between OSPFv3 Hello packets on a virtual link.

```
set protocols ospfv3 [ process process-id ] area area-id virtual-link router-id
hello-interval interval
```

```
delete protocols ospfv3 [ process process-id ] area area-id virtual-link router-
id hello-interval
```

```
show protocols ospfv3 [ process process-id ] area area-id virtual-link router-id
hello-interval
```

Hello packets are sent every 10 seconds.

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

area-id

The ID of an OSPFv3 area being configured, expressed as an IP address or a decimal value.

router-id

The router ID for an OSPFv3 process. The format is an IPv4 address.

interval

The interval, in seconds, between Hello packets. This value must be the same for all nodes on the network. The range is 1 to 65535. The default is 10.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      area area-id {
        virtual-link router-id {
          hello-interval interval
        }
      }
    }
  }
}
```

Use this command to set the interval at which OSPFv3 Hello packets are sent for a virtual link.

A hello packet is an OSPFv3 packet used to detect and maintain relationships with neighbors on the same network (directly connected routers). The greater the interval between Hello packets, the less router traffic occurs, but the longer it takes for topological changes to be detected.

The hello interval must be the same for all routers that are to establish two-way communication within a network. If two routers do not agree on these parameters, they do not establish adjacencies and disregard communication from each other.

Use the `set` form of this command to set the hello interval.

Use the `delete` form of this command to restore a hello interval of 10 seconds.

Use the `show` form of this command to display hello-interval configuration.

protocols ospfv3 area virtual-link retransmit-interval

Specifies the retransmit interval for a virtual link.

```
set protocols ospfv3 [ process process-id ] area area-id virtual-link router-id
retransmit-interval interval
```

```
delete protocols ospfv3 [ process process-id ] area area-id virtual-link router-id
retransmit-interval
```

```
show protocols ospfv3 [ process process-id ] area area-id virtual-link router-id
retransmit-interval
```

Unacknowledged LSAs are retransmitted at five-second intervals.

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

area-id

The ID of an OSPFv3 area being configured, expressed as an IP address or a decimal value.

router-id

The router ID for an OSPFv3 process. The format is an IPv4 address.

interval

The interval, in seconds, between retransmitting unacknowledged link-state advertisements (LSAs). This interval must be the same for all nodes on the network. The range is 1 to 65535. The default interval is 5.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      area area-id {
        virtual-link router-id {
          retransmit-interval interval
        }
      }
    }
  }
}
```

Use this command to set the retransmit interval for a virtual link. The interval is the number of seconds before retransmitting an unacknowledged LSA.

When an OSPFv3 router sends an LSA to a neighbor, the neighbor acknowledges receipt with a link-state acknowledgment (LS Ack) packet. If the local router fails to receive the expected LS Ack packet, it retransmits the LSA at the interval specified by this command. This interval must be the same for all nodes on the network.

Use the `set` form of this command to set a retransmit interval for a virtual link.

Use the `delete` form of this command to restore a retransmit interval of five seconds for unacknowledged LSAs.

Use the `show` form of this command to display retransmit-interval configuration.

protocols ospfv3 area virtual-link transmit-delay

Specifies the transmit delay for a virtual link.

```
set protocols ospfv3 [ process process-id ] area area-id virtual-link router-id
transmit-delay delay
```

```
delete protocols ospfv3 [ process process-id ] area area-id virtual-link router-id
transmit-delay
```

```
show protocols ospfv3 [ process process-id ] area area-id virtual-link router-id
transmit-delay
```

Link-state transmits occur at one-second intervals.

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

area-id

The ID of an OSPFv3 area being configured, expressed as an IP address or a decimal value.

router-id

The router ID for an OSPFv3 process. The format is an IPv4 address.

delay

The delay, in seconds, between link state transmits. This value must be the same for all nodes on the network. The range is 1 to 65535. The default is 1.

Configuration mode

```
protocols {
  ospfv3 {
    process process-id {
      area area-id {
        virtual-link router-id {
          transmit-delay delay
        }
      }
    }
  }
}
```

Use this command to set the transmit delay for a virtual link in an area. This delay is the estimated time required to send a link-state update (LSU) packet.

This timer is used to accommodate transmission and propagation delays on the network, particularly on low-speed networks in which delays may be significant. The router

increments the age of link-state advertisements (LSAs) in LSU packets to account for these delays.

The delay includes both the transmission time and the propagation delay across the network. The transmit delay is added to the age of the LSA packet before the LSA is transmitted. The LSA age is used to help the network sequence LSAs, so that it can determine which of competing LSAs is the more recent and trustworthy.

LSAs are numbered in sequence, but the sequence numbers are finite, and so cannot be used as the sole determinant of the most recent LSA. Instead, OSPFv3 also tracks the age of LSAs. Each time the LSA is forwarded to another router, its current age is incremented by the transmit delay. The age of the packet, together with its sequence number, helps the receiving router to determine which version of a received LSA is more recent, and therefore to be used.

Use the `set` form of this command to set the transmit delay. Set the transmit-delay to be greater than zero. Also, take into account the transmission and propagation delays for the interface.

Use the `delete` form of this command to restore an interval of one second for link-state transmits.

Use the `show` form of this command to display the transmit-delay configuration.

Chapter 7. OSPFv3 Interface Commands

interfaces ipv6 ospfv3

Enables OSPFv3 on a specified interface.

```
set interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ]
```

```
delete interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ]
```

```
show interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ]
```

interface

The type of interface. For detailed keywords and arguments that can be specified as interface types, refer to [Supported Interface Types](#).

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

instance-id

The OSPFv3 instance ID. The range is from 0 to 255.

Configuration mode

```
interfaces interface {
  ipv6 {
    ospfv3 {
      process process-id {
        instance-id instance-id {
        }
      }
    }
  }
}
```

Use this command to enable the OSPFv3 routing protocol on an interface.

Use the **set** form of this command to enable OSPFv3 on an interface.

Use the **delete** form of this command to remove all OSPFv3 configuration and disable OSPFv3 on an interface.

Use the **show** form of this command to display OSPFv3 configuration.

interfaces ipv6 ospfv3 cost

Sets the routing cost for OSPFv3 on an interface.

```
set interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] cost cost
```

```
delete interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] cost
```

```
show interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] cost
```

For details on the default cost of OSPFv3, see the Usage Guidelines.

interface

The type of interface. For detailed keywords and arguments that can be specified as interface types, see [Chapter 5: Supported Interface Types](#).

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

instance-id

The OSPFv3 instance ID. The range is from 0 to 255.

cost

The link-state metric (OSPFv3 cost) to be advertised in the link-state advertisement (LSA) as the cost of sending packets over the interface. The range is 1 to 65535.

Configuration mode

```
interfaces interface {
  ipv6 {
    ospfv3 {
      process process-id {
        instance-id instance-id {
          cost cost
        }
      }
    }
  }
}
```

Use this command to manually override the default OSPFv3 cost computed by the system for an interface. You can assign only one cost for each interface.

By default, the metric associated with a link is computed as follows:

```
Cost = 108/bandwidth
```

The cost of reaching any destination is the sum of the costs of the individual hops. Costs are always rounded to the nearest integer. Costs lower than 1 are rounded up to 1.

[Table 3: OSPF Costs for Common Media Types](#) shows the OSPFv3 costs for some common media types.

Table 3. OSPF Costs for Common Media Types

Media Type	OSPF Cost
56 Kbps	1785
64 Kbps	1562
128 Kbps	781
256 Kbps	390
512 Kbps	195
768 Kbps	130
T1 (1.544 Mbps)	64
E1 (2.048 Mbps)	48
4 Mbps Token Ring	6
10 Mbps Ethernet	10
16 Mbps Token Ring	6
T3 (44.736 Mbps)	2
100+ Mbps	1

The values in [Table 3: OSPF Costs for Common Media Types](#) show how OSPFv3 fails to distinguish between interfaces faster than 100 Mbps, for example, between Fast Ethernet (100 Mbps) and Gigabit Ethernet (1000 Mbps) interfaces. If you want to distinguish interfaces equal to or greater than 100 Mbps, you must manually configure the cost of the interface by using this command.

Use the **set** form of this command to specify the OSPFv3 cost for the interface.

Use the **delete** form of this command to restore the default cost.

Use the **show** form of this command to display cost configuration.

interfaces ipv6 ospfv3 dead-interval

Sets the OSPFv3 dead interval for an interface.

```
set interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] instance-id dead-interval interval
```

```
delete interfaces interface ipv6 ospfv3 [ process process-id instance-id
instance-id ] dead-interval
```

```
show interfaces interface ipv6 ospfv3 [ process process-id instance-id
instance-id ] dead-interval
```

The default for the dead interval is 40 seconds.

interface

The type of interface. For detailed keywords and arguments that can be specified as interface types, see [Chapter 5: Supported Interface Types](#).

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

instance-id

The OSPFv3 instance ID. The range is from 0 to 255.

interval

The time, in seconds, that this interface should wait to detect Hello packets from neighboring routers before declaring the neighbor down. The range is 1 to 65535. The default is 40 seconds.

Configuration mode

```
interfaces interface {
  ipv6 {
    ospfv3 {
      process process-id {
        instance-id instance-id {
          dead-interval interval
        }
      }
    }
  }
}
```

Use this command to specify the interval during which an interface should expect a hello packet from its neighbor.

If the dead interval passes without the interface receiving a hello packet from the neighbor, the status of the neighbor is changed to out-of-service, and all associated state is cleared.

The dead interval must be the same for all routers that are to establish two-way communication within a network. If two routers do not agree on these parameters, they do not establish adjacencies and disregard communication from each other.

Use the **set** form of this command to specify the dead interval.

Use the **delete** form of this command to restore the default dead interval.

Use the **show** form of this command to display dead-interval configuration.

interfaces ipv6 ospfv3 hello-interval

Sets the interval between OSPFv3 Hello packets on an interface.

```
set interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] hello-interval interval
```

```
delete interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] hello-interval
```

```
show interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] hello-interval
```

Hello packets are sent every 10 seconds.

interface

The type of interface. For detailed keywords and arguments that can be specified as interface types, see [Chapter 5: Supported Interface Types](#).

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

instance-id

The OSPFv3 instance ID. The range is from 0 to 255.

interval

The interval, in seconds, between Hello packets. This value must be the same for all nodes on the network. The range is 1 to 65535. The default is 10.

Configuration mode

```
interfaces interface {
  ipv6 {
    ospfv3 {
      process process-id {
        instance-id instance-id {
          hello-interval interval
        }
      }
    }
  }
}
```

Use this command to set the interval at which OSPFv3 Hello packets are sent for an interface.

A hello packet is an OSPFv3 packet used to detect and maintain relationships with neighbors on the same network (directly connected routers). The greater the interval between Hello packets, the less router traffic occurs, but the longer it takes for topological changes to be detected.

The hello interval must be the same for all routers that are to establish two-way communication within a network. If two routers do not agree on these parameters, they do not establish adjacencies and disregard communication from each other.

Use the **set** form of this command to set the hello interval.

Use the **delete** form of this command to restore the default hello interval.

Use the **show** form of this command to display hello-interval configuration.

interfaces ipv6 ospfv3 link-lsa-suppression enable

Enables link-lsa-suppression for an instance identifier on an interface.

```
set interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] link-lsa-suppression enable
```

```
delete interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] link-lsa-suppression
```

```
show interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] link-lsa-suppression
```

By default, the suppression of the origination of the link-LSAs is disabled.

interface

The type of interface. For detailed keywords and arguments that can be specified as interface types, see [Chapter 5: Supported Interface Types](#).

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

instance-id

The OSPFv3 instance ID. The range is from 0 to 255.

Configuration mode

```
interfaces interface {
  ipv6 {
    ospfv3 {
      process process-id {
        instance-id instance-id {
          link-lsa-suppression enable
        }
      }
    }
  }
}
```

Use this command to suppress the origination of the link-LSAs. If this feature is enabled, and the interface type is not broadcast or Non-Broadcast Multi-Access (NBMA), the router does not originate a link-LSA for the interface.

Use the **set** form of this command to suppress the origination of the link-LSAs.

Use the **delete** form of this command to restore the default setting.

Use the **show** form of this command to display whether link-LSA suppression is enabled.

interfaces ipv6 ospfv3 mtu-ignore

Disables maximum transmission unit (MTU) mismatch detection on an OSPFv3 interface.

```
set interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] mtu-ignore
```

```
delete interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] mtu-ignore
```

```
show interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ]
```

MTU mismatch detection is enabled by default.

interface

The type of interface. For detailed keywords and arguments that can be specified as interface types, see [Chapter 5: Supported Interface Types](#).

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

instance-id

The OSPFv3 instance ID. The range is from 0 to 255.

Configuration mode

```
interfaces interface {
  ipv6 {
    ospfv3 {
      process process-id {
        instance-id instance-id {
          mtu-ignore
        }
      }
    }
  }
}
```

Use this command to disable MTU mismatch detection on an OSPFv3 interface.

OSPFv3 sends the MTU of the interface in a database description packet. If the MTUs of OSPFv3 neighbors do not match, they cannot form an OSPFv3 adjacency. MTU mismatch detection detects MTU mismatches and indicates them in the form of a debug message.

MTU mismatch is an important troubleshooting feature. If MTU mismatch is not enabled, MTU mismatches can be detected only by examining the configuration for both interfaces.

MTU mismatches are unavoidable in some network setups and are even part of the normal setup. MTU mismatch detection should be disabled for these networks, so that normal OSPFv3 adjacencies can be formed.

Use the **set** form of this command to disable MTU mismatch detection.

Use the **delete** form of this command to re-enable MTU mismatch detection.

Use the **show** form of this command to display the OSPFv3 configuration.

interfaces ipv6 ospfv3 neighbor

Configures an IPv6 address for neighbor parameters on an interface.

```
set interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] neighbor
```

```
delete interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] neighbor
```

```
show interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ]
```

interface

The type of interface. For detailed keywords and arguments that can be specified as interface types, see [Chapter 5: Supported Interface Types](#).

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

instance-id

The OSPFv3 instance ID. The range is from 0 to 255.

Configuration mode

```
interfaces interface {
  ipv6 {
    ospfv3 {
      process process-id {
        instance-id instance-id {
          neighbor
        }
      }
    }
  }
}
```

```
}
}
```

Use this command to configure an IPv6 address for neighbor parameters on an interface.

Use the **set** form of this command to configure an IPv6 address for neighbor parameters.

Use the **delete** form of this command to remove the neighbor parameters.

Use the **show** form of this command to display the OSPFv3 configuration.

interfaces ipv6 ospfv3 network

Specifies the OSPFv3 network type for an interface.

```
set interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] network [ broadcast | non-broadcast | point-to-multipoint | point-to-point ]
```

```
delete interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] network
```

```
show interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] network
```

The default network type is broadcast.

interface

The type of interface. For detailed keywords and arguments that can be specified as interface types, see [Chapter 5: Supported Interface Types](#).

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

instance-id

The OSPFv3 instance ID. The range is from 0 to 255.

type

The OSPFv3 network type of the interface. Supported values are as follows:

broadcast: The interface supports broadcast mode, such as a LAN link.

non-broadcast: The interface does not support broadcast mode.

point-to-multipoint: The interface supports point-to-multipoint mode, such as a Point-to-Point Protocol (PPP) interface or a point-to-point logical interface on Frame Relay.

point-to-point: The interface supports point-to-point mode, such as a Non-Broadcast Multi-Access (NBMA) interface.

The default is broadcast.

Configuration mode

```

interfaces interface {
  ipv6 {
    ospfv3 {
      process process-id {
        instance-id instance-id {
          network type
        }
      }
    }
  }
}

```

Use this command to configure and display the OSPFv3 network type for an interface.

Use the **set** form of this command to specify the network type.

Use the **delete** form of this command to remove the network type.

Use the **show** form of this command to display the network type.

interfaces ipv6 ospfv3 priority

Sets the OSPFv3 priority for an interface.

```

set interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] priority priority

```

```

delete interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] priority

```

```

show interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] priority

```

An OSPFv3 interface has a priority of 1.

interface

The type of interface. For detailed keywords and arguments that can be specified as interface types, see [Chapter 5: Supported Interface Types](#).

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

instance-id

The OSPFv3 instance ID. The range is from 0 to 255.

priority

An OSPFv3 router priority for the interface. The range is 0 to 255, for which a router with priority 0 can never become the designated router. The default is 1.

Configuration mode

```

interfaces interface {
  ipv6 {
    ospfv3 {
      process process-id {
        instance-id instance-id {
          priority priority
        }
      }
    }
  }
}

```

Use this command to set the priority for an interface on the broadcast network to which the interface is connected. The priority determines which routers are selected as the Designated Router (DR) and Backup Designated Router (BDR) of the area.

The DR and BDR are used to reduce the amount of traffic in OSPFv3 overhead on broadcast networks, by reducing the number of adjacent routers to which a router must flood its topological information. In broadcast networks (such as Ethernet), each router establishes an adjacency with only the DR and the BDR, rather than with every router in its area. The DR and the BDR then flood this information to all other routers on the network segment.

Priority can range from 0 to 255. In general, the router with the highest priority is elected as the DR, and the router with the second-highest priority is elected as the BDR. The higher the number, the higher the priority.

Routers with a priority of 0 are ineligible for election.

Use the **set** form of this command to specify the OSPFv3 priority.

Use the **delete** form of this command to restore the default priority.

Use the **show** form of this command to display priority configuration.

interfaces ipv6 ospfv3 retransmit-interval

Sets the OSPFv3 retransmit interval for an interface.

```

set interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] retransmit-interval interval

```

```

delete interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] retransmit-interval

```

```

show interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] retransmit-interval

```

Unacknowledged LSAs are retransmitted at five-second intervals.

interface

The type of interface. For detailed keywords and arguments that can be specified as interface types, see [Chapter 5: Supported Interface Types](#).

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

instance-id

The OSPFv3 instance ID. The range is from 0 to 255.

interval

The time, in seconds, to wait for an acknowledgement, after which the system retransmits a link-state advertisement (LSA) packet to its neighbors. The range is 3 to 65535. The default is 5.

Configuration mode

```
interfaces interface {
  ipv6 {
    ospfv3 {
      process process-id {
        instance-id instance-id {
          retransmit-interval interval
        }
      }
    }
  }
}
```

Use this command to specify how long an interface waits for an acknowledgment of a link-state update before resending the update.

The link-state update packet is part of the exchange of topology databases between routers. When the initial database description (DD) packet is sent, it contains only the headers of the LSAs. If the receiving router determines that it requires that piece of the OSPFv3 topology, it sends a link-state request packet to request the complete LSA from the sending router.

After the update packet is sent, the sending router waits for an acknowledgement, either implicit or explicit, from the receiving router. In an explicit acknowledgement, the receiving router sends a link-state acknowledge (LS-Ack) packet to the router that sent the update. In an implicit acknowledgement, the router that sent the update receives an LSA from the receiving router that contains the update information.

If the retransmit interval passes with neither an explicit nor an implicit acknowledgement, the sending router retransmits the link-state update packet.

Too high an interval slows network convergence. Too small an interval causes unnecessary retransmission.

Use the **set** form of this command to set the OSPFv3 retransmit interval for an interface.

Use the **delete** form of this command to restore the default retransmit interval.

Use the **show** form of this command to display retransmit interval configuration.

interfaces ipv6 ospfv3 transmit-delay

Specifies the OSPFv3 transmit delay for an interface.

```
set interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] transmit-delay delay
```

```
delete interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] transmit-delay
```

```
show interfaces interface ipv6 ospfv3 [ process process-id instance-id instance-id ] transmit-delay
```

Link-state transmits occur at one-second intervals.

interface

The type of interface. For detailed keywords and arguments that can be specified as interface types, see [Chapter 5: Supported Interface Types](#).

process-id

The OSPFv3 process ID. Enter alphanumeric characters.

instance-id

The OSPFv3 instance ID. The range is from 0 to 255.

delay

The delay, in seconds, between link-state transmits. This value must be the same for all nodes on the network. The range is 1 to 65535. The default is 1.

Configuration mode

```
interfaces interface {
  ipv6 {
    ospfv3 {
      process process-id {
        instance-id instance-id {
          transmit-delay delay
        }
      }
    }
  }
}
```

Use this command to set the transmit delay for an interface. This delay is the estimated time required to send a link-state update (LSU) packet.

This timer is used to accommodate transmission and propagation delays on the network, particularly on low-speed networks in which delays may be significant. The router

increments the age of link-state advertisements (LSA) in LSU packets to account for these delays.

The value includes both the transmission time and the propagation delay across the network. The transmit delay is added to the age of the LSA packet before the LSA is transmitted. The LSA age is used to help the network sequence LSAs, so that it can determine which of competing LSAs is the more recent and trustworthy.

LSAs are numbered in sequence, but the sequence numbers are finite, and so cannot be used as the sole determinant of the most recent LSA. Instead, OSPFv3 also tracks the age of LSAs. Each time an LSA is forwarded to another router, its current age is incremented by the transmit delay. The age of a packet, together with its sequence number, helps the receiving router to determine which version of a received LSA is more recent, and therefore to be used.

Use the **set** form of this command to set the transmit delay.

Use the **delete** form of this command to restore the default transmit delay.

Use the **show** form of this command to display transmit-delay configuration.

Chapter 8. Supported Interface Types

The following table shows the syntax and parameters of supported interface types. Depending on the command, some of these types may not apply.

Interface Type	Syntax	Parameters
Bridge	bridge <i>brx</i>	<i>brx</i> : The name of a bridge group. The name ranges from br0 through br999.
Data plane	dataplane <i>interface-name</i>	<p><i>interface-name</i>: The name of a data plane interface. Following are the supported formats of the interface name:</p> <ul style="list-style-type: none"> • <i>dp_xpy_pz</i>—The name of a data plane interface, where <ul style="list-style-type: none"> — <i>dp_x</i> specifies the data plane identifier (ID). Currently, only dp0 is supported. — <i>py</i> specifies a physical or virtual PCI slot index (for example, p129). — <i>pz</i> specifies a port index (for example, p1). For example, dp0p1p2, dp0p160p1, and dp0p192p1. • <i>dp_xem_y</i>—The name of a data plane interface on a LAN-on-motherboard (LOM) device that does not have a PCI slot, where <i>em_y</i> specifies an embedded network interface number (typically, a small number). For example, dp0em3. • <i>dp_xsy</i>—The name of a data plane interface in a system in which the BIOS identifies the network interface card to reside in a particular physical or virtual slot <i>y</i>, where <i>y</i> is typically a small number. For example, for the dp0s2 interface, the BIOS identifies slot 2 in the system to contain this interface. • <i>dp_xP_npy_pz</i>—The name of a data plane interface on a device that is installed on a secondary PCI bus, where <i>P_n</i> specifies the bus number. You can use this format to name data plane interfaces on large physical devices with multiple PCI buses. For these devices, it is possible to have network interface cards installed on different buses with these cards having the same slot ID. The value of <i>n</i> must be an integer greater than 0. For example, dp0P1p162p1 and dp0P2p162p1.
Data plane vif	dataplane <i>interface-name</i> vif <i>vif-id</i> [vlan <i>vlan-id</i>]	<p><i>interface-name</i>: Refer to the preceding description.</p> <p><i>vif-id</i>: A virtual interface ID. The ID ranges from 1 through 4094.</p> <p><i>vlan-id</i>: The VLAN ID of a virtual interface. The ID ranges from 1 through 4094.</p>
Loopback	loopback lo or loopback lon	<i>n</i> : The name of a loopback interface, where <i>n</i> ranges from 1 through 99999.
OpenVPN	openvpn <i>vtunx</i>	<i>vtunx</i> : The identifier of an OpenVPN interface. The identifier ranges from vtun0 through vtunx, where <i>x</i> is a nonnegative integer.
Tunnel	tunnel <i>tunx</i> or tunnel <i>tunx</i> parameters	<i>tunx</i> : The identifier of a tunnel interface you are defining. The identifier ranges from tun0 through tunx, where <i>x</i> is a nonnegative integer.

Interface Type	Syntax	Parameters
Virtual tunnel	<code>vti vti</code>	<p><i>vti</i>: The identifier of a virtual tunnel interface you are defining. The identifier ranges from vti0 through vtix, where x is a nonnegative integer.</p> <p>Note: Before you can configure a vti interface, you must configure a corresponding vpn.</p> <p>Note: This interface does not support IPv6.</p>
VRRP	<code>parent-interface vrrp</code> <code>vrrp-group group</code>	<p><i>parent-interface</i>: The type and identifier of a parent interface; for example, data plane dp0p1p2 or bridge br999.</p> <p><i>group</i>: A VRRP group identifier.</p> <p>The name of a VRRP interface is not specified. The system internally constructs the interface name from the parent interface identifier plus the VRRP group number; for example, dp0p1p2v99. Note that VRRP interfaces support the same feature set as does the parent interface.</p>

Chapter 9. VRF Support

VRF support for OSPF and OSPFv3

The router supports the implementation of OSPF and OSPFv3 on routing instances.

If you configure OSPF or OSPFv3 on the router without specifying a routing instance, the router uses the default routing instance. When configuring OSPF or OSPFv3 for a particular routing instance, you must associate the instance with an OSPF process, and the process ID must be specified in the configuration command.

OSPF configuration

All OSPF configuration commands are supported on routing instances.

In the following example, OSPF area 0 is defined for the default routing instance.

```
vyatta@R1# set protocols ospf area 0
```

In the following example, OSPF area 1 is defined for the RED routing instance, which is associated with OSPF process 1.

```
vyatta@R1# set routing routing-instance RED protocols ospf process 1 area 1
```

OSPFv3 configuration

All OSPFv3 configuration commands are supported on routing instances.

 **Note:** In the default routing instance, OSPFv3 supports the default process (configuration without including a process ID) and non-default process (configuration with a process ID). In non-default routing instances, OSPFv3 supports only non-default processes (configuration with a process ID).

The following examples show the syntax for an individual configuration command. For an example of how to configure OSPFv3 processes on routing instances, refer to the section on configuring OSPFv3 on routing instances in *Basic Routing Configuration Guide*.

In the following example, OSPFv3 access list 15 is specified for the default routing instance to filter networks in routing updates.

```
vyatta@R1# set protocols ospfv3 distribute-list 15
```

The following example shows how to apply the same configuration to the RED routing instance, which is associated with OSPFv3 process 10.

```
vyatta@R1# set routing routing-instance RED protocols ospfv3 process 10 distribute-list 15
```

Command support for VRF routing instances

VRF allows a router to support multiple routing tables, one for each VRF routing instance. Some commands in this guide support VRF and can be applied to particular routing instances.

Use the guidelines in this section to determine correct syntax when adding VRF routing instances to commands. For more information about VRF, refer to *Basic Routing Configuration Guide*. This guide includes an overview of VRF, VRF configuration examples, information about VRF-specific features, and a list of commands that support VRF routing instances.

Adding a VRF routing instance to a Configuration mode command

For most Configuration mode commands, specify the VRF routing instance at the beginning of a command. Add the appropriate VRF keywords and variable to follow the initial action (**set**, **show**, or **delete**) and before the other keywords and variables in the command.

Configuration mode example: syslog

The following command configures the syslog logging level for the specified syslog host. The command does not include a VRF routing instance, so the command applies to the default routing instance.

```
vyatta@R1# set system syslog host 10.10.10.1 facility all level debug
vyatta@R1# show system syslog
syslog {
  host 10.10.10.1 {
    facility all {
      level debug
    }
  }
}
```

The following example shows the same command with the VRF routing instance (GREEN) added. Notice that **routing routing-instance GREEN** has been inserted between the basic action (**set** in the example) and the rest of the command. Most Configuration mode commands follow this convention.

```
vyatta@R1# set routing routing-instance GREEN system syslog host 10.10.10.1
facility all level debug
vyatta@R1# show routing
routing {
  routing-instance GREEN {
    system {
      syslog {
        host 11.12.13.2:514 {
          facility all {
            level debug
          }
        }
      }
    }
  }
}
```


Operational mode examples without optional parameters

The following command displays dynamic DNS information for the default routing instance.

```
vyatta@vyatta:~$ show dns dynamic status
```

The following command displays the same information for the specified routing instance (GREEN). The command does not have any optional parameters, so the routing instance is specified at the end of the command.

```
vyatta@vyatta:~$ show dns dynamic status routing-instance GREEN
```

Operational mode example with optional parameters

The following command obtains multicast path information for the specified host (10.33.2.5). A routing instance is not specified, so the command applies to the default routing instance.

```
vyatta@vyatta:~$ mtrace 10.33.2.5 detail
```

The following command obtains multicast path information for the specified host (10.33.2.5) and routing instance (GREEN). Notice that the routing instance is specified before the optional **detail** keyword.

```
vyatta@vyatta:~$ mtrace 10.33.2.5 routing-instance GREEN detail
```

Operational mode example output: SNMP

The following SNMP **show** commands display output for routing instances.

```
vyatta@vyatta:~$ show snmp routing-instance
Routing Instance SNMP Agent is Listening on for Incoming Requests:
Routing-Instance          RDID
-----
RED                        5

vyatta@vyatta:~$ show snmp community-mapping
SNMPv1/v2c Community/Context Mapping:
Community                  Context
-----
commA                      'RED'
commB                      'BLUE'
deva                       'default'
```

```
vyatta@vyatta:~$ show snmp trap-target
SNMPv1/v2c Trap-targets:
Trap-target                Port    Routing-Instance Community
```

```

-----
1.1.1.1                                'RED'                                'test'

vyatta@vyatta:~$ show snmp v3 trap-target
SNMPv3 Trap-targets:
Trap-target          Port    Protocol Auth Priv  Type    EngineID
  Routing-Instance  User
-----
2.2.2.2              '162'  'udp'   'md5  'infor
  'BLUE'             'test'

```

Chapter 10. List of Acronyms

Acronym	Description
ACL	access control list
ADSL	Asymmetric Digital Subscriber Line
API	Application Programming Interface
AS	autonomous system
ARP	Address Resolution Protocol
BGP	Border Gateway Protocol
BIOS	Basic Input Output System
BPDU	Bridge Protocol Data Unit
CA	certificate authority
CHAP	Challenge Handshake Authentication Protocol
CLI	command-line interface
DAD	Duplicate Address Detection
DDNS	dynamic DNS
DHCP	Dynamic Host Configuration Protocol
DHCPv6	Dynamic Host Configuration Protocol version 6
DLCI	data-link connection identifier
DMI	desktop management interface
DMZ	demilitarized zone
DN	distinguished name
DNS	Domain Name System
DSCP	Differentiated Services Code Point
DSL	Digital Subscriber Line
eBGP	external BGP
EGP	Exterior Gateway Protocol
ECMP	equal-cost multipath
ESP	Encapsulating Security Payload
EUI-64	IEEE-defined 64-bit extended unique identifier
FIB	Forwarding Information Base
FTP	File Transfer Protocol
GRE	Generic Routing Encapsulation
HDLC	High-Level Data Link Control
I/O	Input/Output
ICMP	Internet Control Message Protocol
IDS	Intrusion Detection System

Acronym	Description
IEEE	Institute of Electrical and Electronics Engineers
IGP	Interior Gateway Protocol
IPS	Intrusion Protection System
IKE	Internet Key Exchange
IP	Internet Protocol
IPOA	IP over ATM
IPsec	IP security
IPv4	IP Version 4
IPv6	IP Version 6
IS-IS	Intermediate System-to-Intermediate System
ISP	Internet Service Provider
L2TP	Layer 2 Tunneling Protocol
LACP	Link Aggregation Control Protocol
LAN	local area network
LDAP	Lightweight Directory Access Protocol
LLDP	Link Layer Discovery Protocol
MAC	medium access control
MIB	Management Information Base
MLPPP	multilink PPP
MPLS	Multiprotocol Label Switching
MPLS EXP	MPLS experimental
MPLS TE	MPLS Traffic Engineering
MRRU	maximum received reconstructed unit
MTU	maximum transmission unit
NAT	Network Address Translation
ND	Neighbor Discovery
NIC	network interface card
NS	Neighbor Solicitation
NTP	Network Time Protocol
OSPF	Open Shortest Path First
OSPFv2	OSPF Version 2
OSPFv3	OSPF Version 3
PAM	Pluggable Authentication Module
PAP	Password Authentication Protocol
PAT	Port Address Translation
PCI	peripheral component interconnect

Acronym	Description
PKI	Public Key Infrastructure
PPP	Point-to-Point Protocol
PPPoA	PPP over ATM
PPPoE	PPP over Ethernet
PPTP	Point-to-Point Tunneling Protocol
PVC	permanent virtual circuit
QoS	quality of service
RADIUS	Remote Authentication Dial-In User Service
RA	router advertisement
RIB	Routing Information Base
RIP	Routing Information Protocol
RIPng	RIP next generation
RS	router solicitation
Rx	receive
SLAAC	Stateless address auto-configuration
SNMP	Simple Network Management Protocol
SMTP	Simple Mail Transfer Protocol
SONET	Synchronous Optical Network
SSH	Secure Shell
STP	Spanning Tree Protocol
TACACS+	Terminal Access Controller Access Control System Plus
TCP	Transmission Control Protocol
ToS	Type of Service
Tx	transmit
UDP	User Datagram Protocol
vif	virtual interface or VLAN interface
VLAN	virtual LAN
VPN	Virtual Private Network
VRRP	Virtual Router Redundancy Protocol
WAN	wide area network