

# Chapter 11

## OSPF Monitoring and Troubleshooting

Table 37 summarizes the command-line interface (CLI) commands you can use to monitor OSPF. In the table, the commands are grouped by functionality. In the remainder of this chapter, they are explained alphabetically.

**Table 37: Commands for Monitoring OSPF**

Task or Information to Monitor	Command
Status of interfaces on which OSPF is running.	show ospf interface on page 416
Link-state database entries.	show ospf database on page 411
	clear ospf database on page 409
OSPF routing table entries.	show ospf route on page 423
Adjacent routers.	show ospf neighbor on page 420
	clear ospf neighbor on page 410
SPF log.	show ospf log on page 420
General OSPF statistics.	show ospf statistics on page 425
	clear ospf statistics on page 410

### clear ospf database

<b>Syntax</b>	clear ospf database <purge>
<b>Description</b>	<p>Delete the entries in the OSPF link-state advertisement database.</p> <p>This command is useful only for testing purposes. Use it with care because it causes significant network perturbation.</p>
<b>Options</b>	<p>none—Discard all link-state advertisements other than the system’s own (the system’s own link-state advertisements (LSAs) are regenerated). To resynchronize the database, all adjacent neighbors that are in the state EXSTART or higher are destroyed. They will be reacquired and the databases will be synchronized again.</p> <p>purge—(Optional) Discard all entries in the link-state advertisement database; that is, all link-state advertisements are set to MAXAGE and are flooded. The database will be repopulated when the originators of the link-state advertisements receive the MAXAGED link-state advertisements and reissue them.</p>
<b>Required Privilege Level</b>	clear

## clear ospf neighbor

**Syntax** clear ospf neighbor <address>

**Description** Tear down neighbor connections.

**Options** none—Tear down the connections with all neighbors.

*address*—(Optional) Tear down the connection with the specified neighbor.

**Required Privilege Level** clear

## clear ospf statistics

**Syntax** clear ospf statistics

**Description** Clear OSPF statistics.

**Required Privilege Level** clear

**See Also** show ospf statistics on page 425

**Sample Output**

```

user@host> show ospf statistics
Packet type Total Last 5 seconds
Sent Received Sent Received
Hello 58 44 3 1
DbD 12 7 0 0
LSReq 1 2 0 0
LSUpdate 17 21 0 0
LSAck 13 8 0 0
LSAs retransmitted: 0, last 5 seconds: 0
Flood queue depth: 0
Total rexmit entries: 0, db summaries: 0, lsreq entries 0
Packets read: 82, average per run: 1.04, max run: 2
Receive errors:
11 subnet mismatches

user@host> clear ospf statistics

user@host> show ospf statistics
Packet type Total Last 5 seconds
Sent Received Sent Received
Hello 0 0 0 0
DbD 0 0 0 0
LSReq 0 0 0 0
LSUpdate 0 0 0 0
LSAck 0 0 0 0
LSAs retransmitted: 0, last 5 seconds: 0
Flood queue depth: 0
Total rexmit entries: 0, db summaries: 0, lsreq entries 0
Packets read: 106, average per run: 1.03, max run: 2
Receive errors:
None

user@host>

```

## show ospf database

<b>Syntax</b>	show ospf database <summary   brief   detail   extensive> <lsa-filters>
<b>Description</b>	Display the entries in the OSPF link-state database, which contains data about LSA packets.
<b>Options</b>	<p>brief—(Optional) Display a brief listing of all entries in the OSPF link-state database.</p> <p>detail—(Optional) Display detailed information about the entries in the OSPF link-state database.</p> <p>extensive—(Optional) Display extremely detailed information about the entries in the OSPF link-state database.</p> <p>lsa-filters—(Optional) One or more of the following LSA filters. If you specify more than one filter, only LSAs that match all the filters are displayed. For example, the command show ospf database detail router lsa-id 10.0.0.1 displays all router LSAs in all areas that have an LSA identifier of 10.0.0.1.</p> <p>    advertising-router <i>address</i>—(Optional) Display the LSAs advertised by a particular router.</p> <p>    area <i>area-id</i>—(Optional) Display the LSAs in a particular area.</p> <p>    lsa-id <i>lsa-id</i>—(Optional) Display the LSA with the specified LSA identifier.</p> <p>    lsa-type—(Optional) Display specific types of LSAs. You can specify asbrsummary, extern, netsummary, network, nssa, or router.</p>
	<b>Default:</b> brief
<b>Required Privilege Level</b>	view
<b>Sample Output</b>	<p>Sample Output: show ospf database brief on page 414</p> <p>Sample Output: show ospf database detail on page 415</p> <p>Sample Output: show ospf database extensive on page 415</p> <p>Sample Output: show ospf database summary on page 416</p>
<b>Options at a Glance</b>	Table 38 summarizes which information is included in each of the show ospf database command options. In this table, output fields are listed in alphabetical order. In the Output Fields section, the output fields are listed in the order in which they are displayed.

Table 38: Show OSPF Database Output Field Summary

Options	Field Description
Brief Detail Extensive	Adv Rtr—Address of the router that sent the advertisement.
Brief Detail Extensive	Age—Age of the advertisement, in seconds.
Extensive	Aging timer—How long until aging begins on the advertisement.
All	area—Area number.
Brief Detail Extensive	Cksum—Checksum value of the advertisement.
Extensive	expires—How long until the route expires.
Summary	Externals—Display of the external link-state advertisement database.
Brief Detail Extensive	ID—Link identifier included in the advertisement. An asterisk preceding the identifier marks database entries that originated from the local router.
Extensive	Installed—How long ago the route was installed.
Brief Detail Extensive	Len—Length of the advertisement, in bytes.
Summary	Network LSAs—Number of network link-state advertisements in the link-state database.
Extensive	Ours—Indicates that this is a local advertisement.
Summary	Router LSAs—Number of router link-state advertisements in the link-state database.
Brief Detail Extensive	Seq—Link sequence number of the advertisement.
Summary	Summary LSAs—Number of summary link-state advertisements in the link-state database.
Brief Detail Extensive	Type—Type of link advertisement. It can be ASBRSum, External, Network, NSSA, Router, or Summary.
<b>Router Link-state Advertisements</b>	
Detail Extensive	bits—Flags describing the router that generated the LSP.
Detail Extensive	link count—Number of links in the advertisement.
<b>Each Link</b>	
Detail Extensive	data—For stub networks, the subnet mask. Otherwise, the IP address of the router that generated the LSP.
Detail Extensive	id—ID of a router or subnet on the link.
Detail Extensive	TOS count—Number of type-of-service (ToS) entries in the advertisement.
Detail Extensive	TOS 0 metric—Metric for ToS 0.
Detail Extensive	type—Type of link. It can be PointToPoint, Transit, Stub, or Virtual.
<b>Each ToS entry</b>	
Detail Extensive	metric—Metric for the ToS.
Detail Extensive	TOS—Type of service value.
<b>Network Link-state Advertisements</b>	
Detail Extensive	attached router—ID of the attached neighbor.
Detail Extensive	mask—Network mask.
<b>Summary Link-state Advertisements</b>	
Detail Extensive	mask—Network mask.
Detail Extensive	metric—Metric for the ToS.
Detail Extensive	TOS—Type of service value.

<b>Output Fields</b>	area—Area number. Area 0.0.0.0 is the backbone area.
	Type—Type of link advertisement. It can be ASBRSum, Extern, Network, NSSA, Router, or Summary.
	ID—Link identifier included in the advertisement. An asterisk preceding the identifier marks database entries that originated from the local router.
	Adv Rtr—Address of the router that sent the advertisement.
	Seq—Link sequence number of the advertisement.
	Age—Age of the advertisement, in seconds.
	Cksum—Checksum value of the advertisement.
	Len—Length of the advertisement, in bytes.
	For router link-state advertisements:
	bits—Flags describing the router that generated the LSP.
	link count—Number of links in the advertisement.
	For each link:
	id—ID of a router or subnet on the link.
	data—For stub networks, the subnet mask. Otherwise, the IP address of the router that generated the LSP.
	type—Type of link. It can be PointToPoint, Transit, Stub, or Virtual.
	TOS count—Number of type-of-service (ToS) entries in the advertisement.
	TOS 0 metric—Metric for ToS 0.
	For each ToS entry:
	TOS—Type of service (ToS) value.
	metric—Metric for the ToS.
	Aging timer—(Extensive output only) How long until aging begins on the advertisement.
	Installed—(Extensive output only) How long ago the route was installed.
	expires—(Extensive output only) How long until the route expires.
	Ours—(Extensive output only) Indicates that this is a local advertisement.
	For network link-state advertisements:
	mask—Network mask.
	attached router—ID of the attached neighbor.

For summary link-state advertisements:

mask—Network mask.

TOS—Type of service (ToS) value.

metric—Metric for the ToS.

Router LSAs—(Summary output only) Number of router link-state advertisements in the link-state database.

Network LSAs—(Summary output only) Number of network link-state advertisements in the link-state database.

Summary LSAs—(Summary output only) Number of summary link-state advertisements in the link-state database.

Externals—(Summary output only) Display of the external link-state advertisement database.

**Sample Output: show ospf database brief**

```

user@host> show ospf database brief
OSPF link state database, area 0.0.0.0
  Type      ID                Adv Rtr           Seq              Age              Cksum
Len
Router     10.250.240.8      10.250.240.8     0x800001fc      2388             0x3684           36
Router     10.250.240.17    10.250.240.17    0x80000217      1835             0x444c           36
Router     10.250.240.32    10.250.240.32    0x80000232      1876             0x0158           36
Router     10.250.240.35    10.250.240.35    0x80000291      1100             0x4aa5           36
Network    192.168.254.230  10.250.240.8     0x800001cc      117              0xab67           40
Summary    10.1.2.0          10.250.240.17    0x80000216      1535             0x1729           28
Summary    10.1.3.34         10.250.240.8     0x8000013a      2217             0x842f           28
Summary    10.1.3.34         10.250.240.35    0x800001a3      800              0x0f20           28
Summary    10.1.3.35         10.250.240.8     0x8000013b      288              0x7839           28
Summary    10.1.3.36         10.250.240.35    0x800001a4      1430             0xf833           28
Summary    10.1.2.48         10.250.240.8     0x800001f7      1317             0xaa8d           28
Summary    10.1.2.48         10.250.240.32    0x80000232      430              0xa242           28

OSPF link state database, area 1.0.0.0
  Type      ID                Adv Rtr           Seq              Age              Cksum  Len
Router     10.250.240.9      10.250.240.9     0x80000267      116              0x1bb3           36
Router     10.250.240.10    10.250.240.10    0x800001ce      2238             0xc6fe           36
Router     10.250.240.11    10.250.240.11    0x80000207      1896             0xca60           36
Router     10.250.240.12    10.250.240.12    0x800002a7      117              0x6029           36
Router     10.250.240.17    10.250.240.17    0x80000232      635              0x2fc7           60
Network    10.1.2.2          10.250.240.17    0x80000213      2043             0x43f5           32
Network    10.1.2.82         10.250.240.17    0x80000210      335              0x34b6           32
Network    10.1.1.130        10.250.240.17    0x800001e2      543              0x490a           36
Summary    10.1.3.34         10.250.240.17    0x8000014f      1743             0x2e66           28
Summary    10.1.3.35         10.250.240.9     0x80000168      1316             0x186b           28
Summary    10.1.3.35         10.250.240.17    0x80000150      35               0x2270           28
Summary    10.1.3.36         10.250.240.9     0x80000167      1916             0x1073           28
Summary    10.1.3.36         10.250.240.17    0x8000014f      2135             0x1a78           28
Summary    10.1.2.48         10.250.240.10    0x800001ca      1638             0x035f           28
Summary    10.1.3.64         10.250.240.10    0x800001ca      738              0x364b           28
Summary    10.1.3.64         10.250.240.17    0x8000020f      843              0x80b4           28
Summary    192.168.254.224  10.250.240.17    0x80000216      1443             0x4cb7           28

OSPF external link state database
  Type      ID                Adv Rtr           Seq              Age              Cksum  Len

```

**Sample Output: show ospf database detail**

```

user@host> show ospf database detail
      OSPF link state database, area 0.0.0.0
Type      ID          Adv Rtr          Seq      Age  Cksum  Len
Router    10.250.240.8    10.250.240.8    0x800001fd 464  0x3485  36
  bits 0x1, link count 1
  id 192.168.254.230, data 192.168.254.230, type Transit (2)
  TOS count 0, TOS 0 metric 1
Router    10.250.240.17 10.250.240.17    0x80000218 119  0x424d  36
  bits 0x1, link count 1
  id 192.168.254.230, data 192.168.254.227, type Transit (2)
  TOS count 0, TOS 0 metric 1
Router    10.250.240.32 10.250.240.32    0x80000233 306  0xfe59  36
  bits 0x1, link count 1
  id 192.168.254.230, data 192.168.254.225, type Transit (2)
  TOS count 0, TOS 0 metric 1
Router    10.250.240.35 10.250.240.35    0x80000291 1576 0x4aa5  36
  bits 0x1, link count 1
  id 192.168.254.230, data 192.168.254.229, type Transit (2)
  TOS count 0, TOS 0 metric 1
Network   192.168.254.230 10.250.240.8    0x800001cc  593  0xab67  40
  mask 255.255.255.240
  attached router 10.250.240.8
  attached router 10.250.240.32
  attached router 10.250.240.17
  attached router 10.250.240.35
Summary   10.1.2.0          10.250.240.17    0x80000216 2011 0x1729  28
  mask 255.255.255.240
  TOS 0x0, metric 1
Summary   10.1.3.34         10.250.240.8     0x8000013b  293  0x8230  28
  mask 255.255.255.255
  TOS 0x0, metric 65
...

```

**Sample Output: show ospf database extensive**

```

user@host> show ospf database extensive
      OSPF link state database, area 0.0.0.0
Type      ID          Adv Rtr          Seq      Age  Cksum  Len
Router    10.250.240.8    10.250.240.8    0x800001fd 766  0x3485  36
  bits 0x1, link count 1
  id 192.168.254.230, data 192.168.254.230, type Transit (2)
  TOS count 0, TOS 0 metric 1
  Aging timer 00:47:13
  Installed 00:12:44 ago, expires in 00:47:14

Router    10.250.240.17 10.250.240.17    0x80000218  421  0x424d  36
  bits 0x1, link count 1
  id 192.168.254.230, data 192.168.254.227, type Transit (2)
  TOS count 0, TOS 0 metric 1
  Gen timer 00:42:58 Aging timer 00:52:58
  Installed 00:07:01 ago, expires in 00:52:59
  Ours

Router    10.250.240.32 10.250.240.32    0x80000233  608  0xfe59  36
  bits 0x1, link count 1
  id 192.168.254.230, data 192.168.254.225, type Transit (2)
  TOS count 0, TOS 0 metric 1
  Aging timer 00:49:51
  Installed 00:10:04 ago, expires in 00:49:52

Network   192.168.254.230 10.250.240.8    0x800001cc  895  0xab67  40
  mask 255.255.255.240
  attached router 10.250.240.8
  attached router 10.250.240.32
  attached router 10.250.240.17
  attached router 10.250.240.35

```

```

    Aging timer 00:45:05
    Installed 00:14:53 ago, expires in 00:45:05

Summary 10.1.2.0          10.250.240.17    0x80000217    121 0x152a 28
mask 255.255.255.240
TOS 0x0, metric 1
Gen timer 00:47:58 Aging timer 00:57:58
Installed 00:02:01 ago, expires in 00:57:59
Ours
Summary 10.1.3.34        10.250.240.8     0x8000013b    595 0x8230 28
mask 255.255.255.255
TOS 0x0, metric 65
Aging timer 00:50:05
Installed 00:09:53 ago, expires in 00:50:05
...

```

**Sample Output: show ospf database summary**

```

user@host> show ospf database summary
Area 0.0.0.0:
  4 Router LSAs
  1 Network LSA
  13 Summary LSAs

Area 1.0.0.0:
  5 Router LSAs
  3 Network LSAs
  12 Summary LSAs

Externals:

```

## show ospf interface

**Syntax** show ospf interface <instance *instance name*> <brief | detail | extensive>

**Description** Display the status of all interfaces that are running OSPF.

**Options** brief—(Optional) Display brief status information about OSPF interfaces.

detail—(Optional) Display detailed status information about OSPF interfaces.

extensive—(Optional) Display extremely detailed status information about OSPF interfaces, including information about what is queued on the interfaces and neighbors. When OSPF is idle, the output of the extensive option is identical to that of the detail option.

instance *instance name*—(Optional) Display all OSPF interfaces under the named routing instance.

**Default:** brief

**Required Privilege Level** view

**Sample Output** Sample Output: show ospf interface brief on page 419  
 Sample Output: show ospf interface detail on page 419  
 Sample Output: show ospf interface extensive on page 419

**Options at a Glance** Table 39 summarizes which information is included in each of the show ospf interface command options. In this table, output fields are listed in alphabetical order. In the Output Fields section, the output fields are listed in the order in which they are displayed.

Table 39: Show OSPF Interface Output Field Summary

Options	Field Description
Extensive	Ack list—Acknowledgment list. List of pending acknowledgments on this interface.
Detail Extensive	address—Address of the interface.
Detail Extensive	adj count—Number of adjacent neighbors.
All	Area—Number of the area that the interface is in.
Detail Extensive	BDR addr—Address of the backup designated router.
All	BDR ID—Address of the area's border router.
Detail Extensive	cost—Interface's cost (metric).
Detail Extensive	Dead—Dead timer.
Extensive	Descriptor list—List of packet descriptors.
Detail Extensive	DR addr—Address of the designated router.
All	DR ID—Address of the area's designated router.
Extensive	Flood list—List of LSAs pending flood on this interface.
Detail Extensive	Hello—Hello timer.
All	Intf—Name of the interface.
Detail Extensive	mask—Mask of the interface.
Detail Extensive	MTU—Interface's MTU.
All	Nbrs—Number of neighbors on this interface.
Detail Extensive	OSPF area type—Time of OSPF area.
Detail Extensive	ReXmit—Retransmit timer.
All	State—State of the interface.
Detail Extensive	Type—Type of interface.

- **Output Fields** Intf—Name of the interface.
- State—State of the interface. It can be BDR, Down, DR, DROther, Loop, PtToPt, or Waiting.
- Area—Number of the area that the interface is in.
- DR ID—Address of the area’s designated router.
- BDR ID—Address of the area’s border router.
- Nbrs—Number of neighbors on this interface.
- Type—(Detail and Extensive output only) Type of interface. It can be LAN, NBMA, P2MP, P2P, or Virtual.
- address—(Detail and Extensive output only) Address of the interface.
- mask—(Detail and Extensive output only) Mask of the interface.
- MTU—(Detail and Extensive output only) Interface’s MTU.
- cost—(Detail and Extensive output only) Interface’s cost (metric).
- DR addr—(Detail and Extensive output only) Address of the designated router.
- BDR addr—Address of the backup designated router.
- adj count—(Detail and Extensive output only) Number of adjacent neighbors.
- Flood list—(Extensive output only) List of LSAs pending flood on this interface.
- Ack list—(Extensive output only) Acknowledgment list. List of pending acknowledgments on this interface.
- Descriptor list—(Extensive output only) List of packet descriptors.
- Dead—(Detail and Extensive output only) Configured value for the Dead timer.
- Hello—(Detail and Extensive output only) Configured value for the Hello timer.
- ReXmit—(Detail and Extensive output only) Configured value for the Retransmit timer.
- OSPF area type—(Detail and Extensive output only) Type of OSPF area. It can be Stub, Not Stub, or Stub NSSA.

**Sample Output: show ospf interface brief**

```
user@host> show ospf interface brief
Intf          State   Area      DR ID      BDR ID      Nbrs
at-5/1/0.0    PtToPt 0.0.0.0   0.0.0.0    0.0.0.0     1
ge-2/3/0.0    DR      0.0.0.0   192.168.4.16 192.168.4.15 1
lo0.0         DR      0.0.0.0   192.168.4.16 0.0.0.0     0
so-0/0/0.0    Down    0.0.0.0   0.0.0.0    0.0.0.0     0
so-6/0/1.0    PtToPt 0.0.0.0   0.0.0.0    0.0.0.0     1
so-6/0/2.0    Down    0.0.0.0   0.0.0.0    0.0.0.0     0
so-6/0/3.0    PtToPt 0.0.0.0   0.0.0.0    0.0.0.0     1
```

**Sample Output: show ospf interface detail**

```
user@host> show ospf interface detail
Interface     State   Area      DR ID      BDR ID      Nbrs
ge-1/0/0.0    DR      0.0.0.0   10.10.20.103 10.10.20.102 1
Type LAN, address 10.10.20.18, mask 255.255.255.248, MTU 1500, cost 1
DR addr 10.10.20.18, BDR addr 10.10.20.17, adj count 1
Hello 10, Dead 40, ReXmit 5, Not Stub
ge-3/1/0.0    DR      0.0.0.0   10.10.20.103 10.10.20.104 1
Type LAN, address 10.10.20.27, mask 255.255.255.248, MTU 1500, cost 1
DR addr 10.10.20.27, BDR addr 10.10.20.28, adj count 1
Hello 10, Dead 40, ReXmit 5, Not Stub
lo0.0         DR      0.0.0.0   10.10.20.103 0.0.0.0     0
Type LAN, address 10.10.20.103, mask 255.255.255.255, MTU 65535, cost 1
DR addr 10.10.20.103, BDR addr 0.0.0.0, adj count 0
Hello 10, Dead 40, ReXmit 5, Not Stub
lo0.0         DR      0.0.0.0   10.10.20.103 0.0.0.0     0
Type LAN, address 127.0.0.1, mask 255.255.255.255, MTU 65535, cost 1
DR addr 127.0.0.1, BDR addr 0.0.0.0, adj count 0
Hello 10, Dead 40, ReXmit 5, Not Stub
so-5/0/0.0    PtToPt 0.0.0.0   0.0.0.0     0.0.0.0     0
Type P2P, address 0.0.0.0, mask 0.0.0.0, MTU 4470, cost 1
DR addr 0.0.0.0, BDR addr 0.0.0.0, adj count 0
Hello 10, Dead 40, ReXmit 5, Not Stub
so-5/0/0.0    PtToPt 0.0.0.0   0.0.0.0     0.0.0.0     0
Type P2P, address 10.10.20.250, mask 255.255.255.252, MTU 4470, cost 1
DR addr 0.0.0.0, BDR addr 0.0.0.0, adj count 0, passive
Hello 10, Dead 40, ReXmit 5, Not Stub
```

**Sample Output: show ospf interface extensive**

```
user@host> show ospf interface extensive
Interface     State   Area      DR ID      BDR ID      Nbrs
ge-1/0/0.0    DR      0.0.0.0   10.10.20.103 10.10.20.102 1
Type LAN, address 10.10.20.18, mask 255.255.255.248, MTU 1500, cost 1
DR addr 10.10.20.18, BDR addr 10.10.20.17, adj count 1
Hello 10, Dead 40, ReXmit 5, Not Stub
ge-3/1/0.0    DR      0.0.0.0   10.10.20.103 10.10.20.104 1
Type LAN, address 10.10.20.27, mask 255.255.255.248, MTU 1500, cost 1
DR addr 10.10.20.27, BDR addr 10.10.20.28, adj count 1
Hello 10, Dead 40, ReXmit 5, Not Stub
lo0.0         DR      0.0.0.0   10.10.20.103 0.0.0.0     0
Type LAN, address 10.10.20.103, mask 255.255.255.255, MTU 65535, cost 1
DR addr 10.10.20.103, BDR addr 0.0.0.0, adj count 0
Hello 10, Dead 40, ReXmit 5, Not Stub
lo0.0         DR      0.0.0.0   10.10.20.103 0.0.0.0     0
Type LAN, address 127.0.0.1, mask 255.255.255.255, MTU 65535, cost 1
DR addr 127.0.0.1, BDR addr 0.0.0.0, adj count 0
Hello 10, Dead 40, ReXmit 5, Not Stub
so-5/0/0.0    PtToPt 0.0.0.0   0.0.0.0     0.0.0.0     0
Type P2P, address 0.0.0.0, mask 0.0.0.0, MTU 4470, cost 1
DR addr 0.0.0.0, BDR addr 0.0.0.0, adj count 0
Hello 10, Dead 40, ReXmit 5, Not Stub
so-5/0/0.0    PtToPt 0.0.0.0   0.0.0.0     0.0.0.0     0
Type P2P, address 10.10.20.250, mask 255.255.255.252, MTU 4470, cost 1
DR addr 0.0.0.0, BDR addr 0.0.0.0, adj count 0, passive
Hello 10, Dead 40, ReXmit 5, Not Stub
```

## show ospf log

**Syntax** show ospf log

**Description** Display the entries in the OSPF log of shortest-path-first (SPF) calculations.

**Required Privilege Level** view

**Output Fields** When—Time when the SPF calculation was made.

Type—Type of calculation. It can be Cleanup, External, Interarea, NSSA, Redist, SPF, Stub, Total, or Virtuallink.

Elapsed—How much time has passed since the calculation was made, in seconds.

**Sample Output**

```

user@host> show ospf log
When                Type                Elapsed
-----
1w4d 17:25:58      Stub                0.000017
1w4d 17:25:58      SPF                 0.000070
1w4d 17:25:58      Stub                0.000019
1w4d 17:25:58      Interarea           0.000054
1w4d 17:25:58      External            0.000005
1w4d 17:25:58      Cleanup             0.000203
1w4d 17:25:58      Total               0.000537
1w4d 17:24:48      SPF                 0.000125
1w4d 17:24:48      Stub                0.000017
1w4d 17:24:48      SPF                 0.000100
1w4d 17:24:48      Stub                0.000016
1w4d 17:24:48      Interarea           0.000056
1w4d 17:24:48      External            0.000005
1w4d 17:24:48      Cleanup             0.000238
1w4d 17:24:48      Total               0.000600
...

```

## show ospf neighbor

**Syntax** show ospf neighbor < neighbor *neighbor-address*> <brief | detail | extensive>

**Description** Display information about all OSPF neighbors.

**Options** brief—(Optional) Display brief information about OSPF neighbors.

detail—(Optional) Display detailed information about OSPF neighbors.

extensive—(Optional) Display extremely detailed information about OSPF neighbors.

neighbor *neighbor-address*—Address or ID of specific OSPF neighbor.

**Default:** brief

**Required Privilege Level** view

**Sample Output** Sample Output: show ospf neighbor brief on page 422  
 Sample Output: show ospf neighbor detail on page 422  
 Sample Output: show ospf neighbor extensive on page 422

**Options at a Glance** Table 40 summarizes which information is included in each of the show ospf neighbor command options. In this table, output fields are listed in alphabetical order. In the Output Fields section, the output fields are listed in the order in which they are displayed.

**Table 40: Show OSPF Neighbor Output Field Summary**

Options	Field Description
All	Address—Address of the neighbor.
Detail Extensive	adjacent—Length of time since the adjacency with the neighbor was established.
Detail Extensive	area—Area that the neighbor is in.
Detail Extensive	BDR—Address of the backup designated router.
All	Dead—Number of seconds until the neighbor becomes unreachable.
Detail Extensive	DR—Address of the designated router.
All	ID—Router ID of the neighbor.
All	Intf—Interface through which the neighbor is reachable.
Detail Extensive	opt—Option bits from the neighbor.
All	Pri—Priority of the neighbor to become the designated router.
All	State—State of the neighbor.
Detail Extensive	Up—Length of time since the neighbor came up.

**Output Fields** Address—Address of the neighbor.

Intf—Interface through which the neighbor is reachable.

State—State of the neighbor. It can be Attempt, Down, Exchange, ExStart, Full, Init, Loading, or 2Way.

ID—Router ID of the neighbor.

Pri—Priority of the neighbor to become the designated router.

Dead—Number of seconds until the neighbor becomes unreachable.

area—(Detail and Extensive output only) Area that the neighbor is in.

opt—(Detail and Extensive output only) Option bits from the neighbor.

DR—(Detail and Extensive output only) Address of the designated router.

BDR—(Detail and Extensive output only) Address of the backup designated router.

Up—(Detail and Extensive output only) Length of time since the neighbor came up.

adjacent—(Detail and Extensive output only) Length of time since the adjacency with the neighbor was established.

• **Sample Output: show ospf neighbor brief**

```
user@host> show ospf neighbor brief
Address      Intf      State      ID          Pri  Dead
192.168.254.225 fxp3.0    2Way       10.250.240.32 128  36
192.168.254.230 fxp3.0    Full       10.250.240.8  128  38
192.168.254.229 fxp3.0    Full       10.250.240.35 128  33
10.1.1.129      fxp2.0    Full       10.250.240.12 128  37
10.1.1.131      fxp2.0    Full       10.250.240.11 128  38
10.1.2.1        fxp1.0    Full       10.250.240.9  128  32
10.1.2.81       fxp0.0    Full       10.250.240.10 128  33
```

• **Sample Output: show ospf neighbor detail**

```
user@host> show ospf neighbor detail
Address      Intf      State      ID          Pri  Dead
192.168.254.225 fxp3.0    2Way       10.250.240.32 128  35
  area 0.0.0.0, opt 0x2, DR 192.168.254.230, BDR 192.168.254.229
  Up 1w5d 18:09:18
192.168.254.230 fxp3.0    Full       10.250.240.8  128  32
  area 0.0.0.0, opt 0x2, DR 192.168.254.230, BDR 192.168.254.229
  Up 1w5d 19:21:39, adjacent 1w5d 19:21:38
192.168.254.229 fxp3.0    Full       10.250.240.35 128  31
  area 0.0.0.0, opt 0x2, DR 192.168.254.230, BDR 192.168.254.229
  Up 1w5d 19:21:39, adjacent 1w5d 19:21:39
10.1.1.129      fxp2.0    Full       10.250.240.12 128  30
  area 1.0.0.0, opt 0x2, DR 10.1.1.130, BDR 10.1.1.131
  Up 1w1d 18:09:20, adjacent 1w1d 18:09:20
10.1.1.131      fxp2.0    Full       10.250.240.11 128  37
  area 1.0.0.0, opt 0x2, DR 10.1.1.130, BDR 10.1.1.131
  Up 1w4d 18:15:02, adjacent 1w4d 18:15:02
10.1.2.1        fxp1.0    Full       10.250.240.9  128  32
  area 1.0.0.0, opt 0x2, DR 10.1.2.2, BDR 10.1.2.1
  Up 1w5d 19:21:38, adjacent 1w5d 19:20:58
10.1.2.81       fxp0.0    Full       10.250.240.10 128  32
  area 1.0.0.0, opt 0x2, DR 10.1.2.82, BDR 10.1.2.81
  Up 1w5d 18:34:57, adjacent 1w5d 18:34:19
```

• **Sample Output: show ospf neighbor extensive**

```
user@host> show ospf neighbor extensive
Address      Intf      State      ID          Pri  Dead
192.168.254.225 fxp3.0    2Way       10.250.240.32 128  35
  area 0.0.0.0, opt 0x2, DR 192.168.254.230, BDR 192.168.254.229
  Up 1w5d 18:09:18
192.168.254.230 fxp3.0    Full       10.250.240.8  128  32
  area 0.0.0.0, opt 0x2, DR 192.168.254.230, BDR 192.168.254.229
  Up 1w5d 19:21:39, adjacent 1w5d 19:21:38
192.168.254.229 fxp3.0    Full       10.250.240.35 128  31
  area 0.0.0.0, opt 0x2, DR 192.168.254.230, BDR 192.168.254.229
  Up 1w5d 19:21:39, adjacent 1w5d 19:21:39
10.1.1.129      fxp2.0    Full       10.250.240.12 128  30
  area 1.0.0.0, opt 0x2, DR 10.1.1.130, BDR 10.1.1.131
  Up 1w1d 18:09:20, adjacent 1w1d 18:09:20
10.1.1.131      fxp2.0    Full       10.250.240.11 128  37
  area 1.0.0.0, opt 0x2, DR 10.1.1.130, BDR 10.1.1.131
  Up 1w4d 18:15:02, adjacent 1w4d 18:15:02
10.1.2.1        fxp1.0    Full       10.250.240.9  128  32
  area 1.0.0.0, opt 0x2, DR 10.1.2.2, BDR 10.1.2.1
  Up 1w5d 19:21:38, adjacent 1w5d 19:20:58
10.1.2.81       fxp0.0    Full       10.250.240.10 128  32
  area 1.0.0.0, opt 0x2, DR 10.1.2.82, BDR 10.1.2.81
  Up 1w5d 18:34:57, adjacent 1w5d 18:34:19
```

## show ospf route

<b>Syntax</b>	show ospf route <detail> <(abr   asbr   extern   inter   intra)>
<b>Description</b>	Display the entries in the OSPF routing table.
<b>Options</b>	<p>none—Display all entries in the OSPF routing table.</p> <p>abr—(Optional) Display OSPF routes to area border routers.</p> <p>asbr—(Optional) Display OSPF routes to autonomous system border routers.</p> <p>detail—(Optional) Display detailed information about the entries in the OSPF routing table.</p> <p>extern—(Optional) Display external OSPF routes.</p> <p>inter—(Optional) Display interarea OSPF routes.</p> <p>intra—(Optional) Display intra-area OSPF routes.</p>
<b>Required Privilege Level</b>	view
<b>Sample Output</b>	<p>Sample Output: show ospf route on page 424</p> <p>Sample Output: show ospf route detail on page 424</p>
<b>Options at a Glance</b>	Table 41 summarizes which information is included in each of the show ospf route command options. In this table, output fields are listed in alphabetical order. In the Output Fields section, the output fields are listed in the order in which they are displayed.

Table 41: Show OSPF Route Output Fields Summary

Options	Field Description
Detail	area—Area ID of the route.
All	Metric—Route's metric value.
All	Next hop addr—Address of the next hop.
All	Next hop i/f—Interface through which the route's next hop is reachable.
Detail	options—Option bits from the link-state advertisement.
Detail	origin—Router from which the route was learned.
All	Prefix—Destination of the route.
All	Route/Path Type—How the route was learned.

- Output Fields** Prefix—Destination of the route.
- Route/Path Type—How the route was learned:
  - ABR—Route to area border router
  - ASBR—Route to AS border router
  - Ext—External router
  - Inter—Interarea route
  - Intra—Intra-area route
  - Network—Network router
- Metric—Route’s metric value.
- Next hop i/f—Interface through which the route’s next hop is reachable.
- Next hop addr—Address of the next hop.
- area—(Detail output only) Area ID of the route.
- options—(Detail output only) Option bits from the link-state advertisement.
- origin—(Detail output only) Router from which the route was learned

```

Sample Output: show ospf route
user@host> show ospf route
Prefix          Route/Path Type  Metric  Next hop i/f  Next hop addr
1.1.1.0/24      Ext2   Network      0      fxp0.0        10.10.0.16
1.1.1.1/32      Intra  AS BR         1      fxp0.0        10.10.0.16
1.2.3.0/24      Ext2   Network      0      fxp0.0        10.10.0.16
10.10.0.0/24    Intra  Network      1      fxp0.0
10.10.1.0/24    Ext2   Network      0      fxp0.0        10.10.0.16
10.10.2.0/24    Ext2   Network      0      fxp0.0        10.10.0.16
10.10.3.0/24    Ext2   Network      0      fxp0.0        10.10.0.16
192.168.0.0/23 Ext2   Network      0      fxp0.0        10.10.0.16
    
```

```

Sample Output: show ospf route detail
user@host> show ospf route detail
Prefix          Route/Path Type  Metric  Next hop i/f  Next hop addr
1.1.1.0/24      Ext2   Network      0      fxp0.0        10.10.0.16
  area 0.0.0.0, options 0x0, origin 1.1.1.1
1.1.1.1/32      Intra  AS BR         1      fxp0.0        10.10.0.16
  area 0.0.0.0, options 0x0, origin 1.1.1.1
1.2.3.0/24      Ext2   Network      0      fxp0.0        10.10.0.16
  area 0.0.0.0, options 0x0, origin 1.1.1.1
10.10.0.0/24    Intra  Network      1      fxp0.0
  area 0.0.0.0, options 0x0, origin 10.10.0.15
10.10.1.0/24    Ext2   Network      0      fxp0.0        10.10.0.16
  area 0.0.0.0, options 0x0, origin 1.1.1.1
10.10.2.0/24    Ext2   Network      0      fxp0.0        10.10.0.16
  area 0.0.0.0, options 0x0, origin 1.1.1.1
10.10.3.0/24    Ext2   Network      0      fxp0.0        10.10.0.16
  area 0.0.0.0, options 0x0, origin 1.1.1.1
192.168.0.0/23 Ext2   Network      0      fxp0.0        10.10.0.16
  area 0.0.0.0, options 0x0, origin 1.1.1.1
    
```

## show ospf statistics

<b>Syntax</b>	show ospf statistics
<b>Description</b>	Display OSPF protocol statistics.
<b>Required Privilege Level</b>	view
<b>Output Fields</b>	<p>Packet type—Type of OSPF packet.</p> <p>Total Sent/Total Received—Total number of packets sent and received.</p> <p>Last 5 seconds Sent/Last 5 seconds Received—Total number of packets sent and received in the last 5 seconds.</p> <p>LSAs retransmitted—Total number of link-state advertisements transmitted, and number retransmitted in the last 5 seconds.</p> <p>Receive errors—Number and type of receive errors.</p>

**Sample Output**

```

user@host> show ospf statistics
Packet type          Total                Last 5 seconds
                   Sent      Received          Sent      Received
Hello                505739    990495             4         5
DbD                   20         26             0         0
LSReq                  6          5             0         0
LSUpdate             27060    15319             0         0
LSAck                10923    52470             0         0

LSAs retransmitted: 16, last 5 seconds: 0

Receive errors:
 862 no interface found
115923 no virtual link found

```

