
Show Commands

ospf

Syntax `ospf [ospf-instance | all]`

Context show>router

Description This command enables the context to display OSPF information.

Parameters *ospf-instance* — Shows the specified OSPF instance.

Values 1 — 31
all — shows all configured OSPF instances

ospf3

Syntax `ospf3 [ospf-instance | all]`

Context show>router

Description This command enables the context to display OSPF3 information.

Parameters *ospf-instance* — Shows the specified OSPF3 instance.

Values 0 — 31 | 64 — 95
0 — 31 ipv6-unicast address-family
64 — 95 ipv4-unicast address-family
all — shows all configured OSPF3 instances

area

Syntax `area [area-id] [detail] [lfa]`

Context show>router>ospf
show>router>ospf3

Description This command displays configuration information about all areas or the specified area. When detail is specified operational and statistical information will be displayed.

Parameters *area-id* — The OSPF area ID expressed in dotted decimal notation or as a 32-bit decimal integer.

detail — Displays detailed information about the specified area.

lfa — Displays Loop-Free Alternate (LFA) next-hop information.

Show Commands

Output OSPF Area Output — The following table describes the standard and detailed command output fields for an OSPF area.

Label	Description
Area Id	A 32 bit integer uniquely identifying an area.
Type	NSSA — This area is configured as an NSSA area. Standard — This area is configured as a standard area (not NSSA or Stub). Stub — This area is configured as a stub area.
SPF Runs	The number of times that the intra-area route table has been calculated using this area's link state database.
LSA Count	The total number of link-state advertisements in this area's link state database, excluding AS External LSA's.
LSA Cksum Sum	The 32-bit unsigned sum of the link-state database advertisements LS checksums contained in this area's link state database. This checksum excludes AS External LSAs (type-5).
No. of OSPF Areas	The number of areas configured on the router.
Virtual Links	The number of virtual links configured through this transit area.
Active IFs	The active number of interfaces configured in this area.
Area Bdr Rtrs	The total number of ABRs reachable within this area.
AS Bdr Rtrs	The total number of ASBRs reachable within this area.
Last SPF Run	The time when the last intra-area SPF was run on this area.
Router LSAs	The total number of router LSAs in this area.
Network LSAs	The total number of network LSAs in this area.
Summary LSAs	The summary of LSAs in this area.
Asbr-summ LSAs	The summary of ASBR LSAs in this area.
Nssa-ext LSAs	The total number of NSSA-EXT LSAs in this area.
Area opaque LSAs	The total number of opaque LSAs in this area.
Total Nbrs	The total number of neighbors in this area.
Total IFs	The total number of interfaces configured in this area.
Total LSAs	The sum of LSAs in this area excluding autonomous system external LSAs.
Blackhole Range	False — No blackhole route is installed for aggregates configured in this area.

Label	Description (Continued)
-------	-------------------------

	True – A lowest priority blackhole route is installed for aggregates configured in this area.
--	-----------------------------------------------------------------------------------------------

Sample Output

```
A:SetupCLI# show router ospf 0 area detail
```

```
=====
Rtr Base OSPFv2 Instance 0 Areas (detail)
=====
```

```
-----
Area Id: 0.0.0.0
-----
```

Area Id	: 0.0.0.0	Type	: Standard
Key Rollover Int.:	10	LFA	: Include
Virtual Links	: 0	Total Nbrs	: 0
Active IFs	: 0	Total IFs	: 2
Area Bdr Rtrs	: 0	AS Bdr Rtrs	: 0
SPF Runs	: 0	Last SPF Run	: Never
Router LSAs	: 0	Network LSAs	: 0
Summary LSAs	: 0	Asbr-summ LSAs	: 0
Nssa ext LSAs	: 0	Area opaque LSAs	: 1
Total LSAs	: 1	LSA Cksum Sum	: 0xd6af
Blackhole Range	: True	Unknown LSAs	: 0

```
-----
Area Id: 1.1.1.1
-----
```

Area Id	: 1.1.1.1	Type	: Stub
Default Cost	: 16777215	Import Summary	: Send Summary
Key Rollover Int.:	10	LFA	: Exclude
Virtual Links	: 0	Total Nbrs	: 0
Active IFs	: 0	Total IFs	: 1
Area Bdr Rtrs	: 0	AS Bdr Rtrs	: 0
SPF Runs	: 0	Last SPF Run	: Never
Router LSAs	: 0	Network LSAs	: 0
Summary LSAs	: 0	Asbr-summ LSAs	: 0
Nssa ext LSAs	: 0	Area opaque LSAs	: 1
Total LSAs	: 1	LSA Cksum Sum	: 0xf493
Blackhole Range	: False	Unknown LSAs	: 0

```
-----
Area Id: 2.2.2.2
-----
```

Area Id	: 2.2.2.2	Type	: Standard
Key Rollover Int.:	10	LFA	: Include
Virtual Links	: 1	Total Nbrs	: 0
Active IFs	: 0	Total IFs	: 0
Area Bdr Rtrs	: 0	AS Bdr Rtrs	: 0
SPF Runs	: 0	Last SPF Run	: Never
Router LSAs	: 0	Network LSAs	: 0
Summary LSAs	: 0	Asbr-summ LSAs	: 0
Nssa ext LSAs	: 0	Area opaque LSAs	: 1
Total LSAs	: 1	LSA Cksum Sum	: 0xd6af
Blackhole Range	: True	Unknown LSAs	: 0

```
=====
A:SetupCLI#
```

Show Commands

```
*A:Bombadil# show router ospf area 0.0.0.0 detail
```

```
=====  
Rtr Base OSPFv2 Instance 0 Area 0.0.0.0 (detail)  
=====
```

```
-----  
Configuration  
-----
```

```
Area Id          : 0.0.0.0          Type          : Standard  
-----
```

```
Statistics  
-----
```

```
Virtual Links    : 0                Total Nbrs     : 2  
Active IFs       : 3                Total IFs      : 3  
Area Bdr Rtrs    : 0                AS Bdr Rtrs   : 0  
SPF Runs         : 7                Last SPF Run   : 10/26/2006 10:09:18  
Router LSAs      : 3                Network LSAs   : 3  
Summary LSAs     : 0                Asbr-summ LSAs : 0  
Nssa ext LSAs    : 0                Area opaque LSAs : 3  
Total LSAs       : 9                LSA Cksum Sum  : 0x28b62  
Blackhole Range  : True              Unknown LSAs   : 0  
=====
```

```
*A:Dut-B# show router ospf 0 area 0.0.0.0 lfa
```

```
=====  
Rtr Base OSPFv2 Instance 0 Path Table  
=====
```

Node	Interface LFA Interface	Nexthop LFA Nexthop
10.20.1.1	to_Dut-A1	10.20.1.1
	to_Dut-C1	10.20.1.3
10.20.1.3	to_Dut-C1	10.20.1.3
	to_Dut-A1	10.20.1.1
10.20.1.4	to_Dut-D1	10.20.1.4
10.20.1.6	to_Dut-D1	10.20.1.4
	to_Dut-C1	10.20.1.3

```
=====  
*A:Dut-B#
```

```
*A:Dut-B# show router ospf 0 area 0.0.0.0 lfa detail
```

```
=====  
Rtr Base OSPFv2 Instance 0 Path Table (detail)  
=====
```

```
OSPF Area : 0.0.0.0  
-----
```

```
Node          : 10.20.1.1          Metric         : 10  
Interface     : to_Dut-A1          Nexthop        : 10.20.1.1  
LFA Interface : to_Dut-C1          LFA Metric     : 20  
LFA type      : linkProtection     LFA Nexthop    : 10.20.1.3
```

```
Node          : 10.20.1.3          Metric         : 10  
Interface     : to_Dut-C1          Nexthop        : 10.20.1.3  
LFA Interface : to_Dut-A1          LFA Metric     : 20  
LFA type      : linkProtection     LFA Nexthop    : 10.20.1.1
```

```

Node           : 10.20.1.4           Metric           : 10
Interface      : to_Dut-D1           Nexthop          : 10.20.1.4

Node           : 10.20.1.6           Metric           : 20
Interface      : to_Dut-D1           Nexthop          : 10.20.1.4
LFA Interface  : to_Dut-C1           LFA Metric       : 30
LFA type       : nodeProtection      LFA Nexthop     : 10.20.1.3

```

```

=====
*A:Dut-B#

```

capabilities

Syntax `area [router-id]`

Context `show>router>ospf`
`show>router>ospf3`

Description This command displays the entries in the Router Information (RI) LSAs.

Parameters *router-id* — Only the LSAs related to that router-id are listed. If no router-id is specified, all database entries are listed

Output **OSPF Capabilities Output** — The following table describes the standard and detailed command output fields for OSPF capabilities.

Sample Output

```

*A:Dut-C# show router ospf capabilities

```

```

=====
Rtr Base OSPFv2 Instance 0 Capabilities
=====

```

scope	Router Id	Capabilities
Area	10.20.1.2	0x14: Stub P2P-VLAN SR Algorithm: IGP-metric-based-SPF SR Label Range: start label 22000 range 1001
Area	10.20.1.3	0x14: Stub P2P-VLAN SR Algorithm: IGP-metric-based-SPF SR Label Range: start label 23030 range 71
Area	10.20.1.4	0x14: Stub P2P-VLAN SR Algorithm: IGP-metric-based-SPF SR Label Range: start label 24000 range 1001
Area	10.20.1.5	0x14: Stub P2P-VLAN SR Algorithm: IGP-metric-based-SPF SR Label Range: start label 25000 range 1001
Area	10.20.1.1	0x14: Stub P2P-VLAN SR Algorithm: IGP-metric-based-SPF SR Label Range: start label 21000 range 1001
Area	10.20.1.2	0x14: Stub P2P-VLAN SR Algorithm: IGP-metric-based-SPF

Show Commands

```

Area          10.20.1.3          SR Label Range: start label 22000 range 1001
                                0x14: Stub P2P-VLAN
                                SR Algorithm: IGP-metric-based-SPF
                                SR Label Range: start label 23030 range 71
-----
No. of LSAs: 7
=====

```

database

Syntax **database** [**type** {**router** | **network** | **summary** | **asbr-summary** | **external** | **nssa** | **all**}] [**area** *area-id*] [**adv-router** *router-id*] [*link-state-id*] [**detail**]

Context show>router>ospf
show>router>ospf3

Description This command displays information about the OSPF link state database (LSDB).
When no command line options are specified, the command displays brief output for all database entries

Parameters *ospf-instance* — The OSPF instance.

Values 1 — 4294967295

type *keyword* — Specifies to filter the OSPF LSDB information based on the type specified by *keyword*.

type **router** — Display only router (Type 1) LSAs in the LSDB.

type **network** — Display only network (Type 2) LSAs in the LSDB.

type **summary** — Display only summary (Type 3) LSAs in the LSDB.

type **asbr-summary** — Display only ASBR summary (Type 4) LSAs in the LSDB.

type **external** — Display only AS external (Type 5) LSAs in the LSDB. External LSAs are maintained globally and not per area. If the display of external links is requested, the area parameter, if present, is ignored.

type **nssa** — Displays only NSSA area-specific AS external (Type 7) LSAs in the LSDB.

type **all** — Display all LSAs in the LSDB. The all keyword is intended to be used with either the **area** *area-id* or the **adv-router** *router-id* [*link-state-id*] parameters.

area *area-id* — Display LSDB information associated with the specified OSPF *area-id*.

adv-router *router-id* [*link-state-id*] — Display LSDB information associated with the specified advertising router. To further narrow the number of items displayed, the *link-state-id* can optionally be specified.

detail — Displays detailed information on the LSDB entries.

Output **OSPF Database Output** — The following table describes the standard and detailed command output fields for an OSPF database.

Label	Description
Area Id	The OSPF area identifier.

Label	Description (Continued)
Type	Router – LSA type of router (OSPF)
LSA Type	<p>Network – LSA type of network (OSPF)</p> <p>Summary – LSA type of summary (OSPF)</p> <p>ASBR Summary – LSA type of ASBR summary (OSPF)</p> <p>Nssa-ext – LSA area-specific, NSSA external (OSPF)</p> <p>Area opaque – LSA type of area opaque (OSPF)</p> <p>router – LSA type of router (OSPF3)</p> <p>Network – LSA type of network (OSPF3)</p> <p>IE Pfx – LSA type of IE Pfx (OSPF3) IE Rtr – LSA type of IE Rtr (OSPF3)</p> <p>IA Pfx – LSA type of IA Pfx (OSPF3)</p> <p>Nssa-ext – NSSA area-specific AS external (OSPF3)</p>
Link State Id	The link state Id is an LSA type specific field containing either a number to distinguish several LSAs from the same router, an interface ID, or a router-id; it identifies the piece of the routing domain being described by the advertisement.
Adv Rtr Id Adv Router Id	The router identifier of the router advertising the LSA.
Age	The age of the link state advertisement in seconds.
Sequence Sequence No	The signed 32-bit integer sequence number.
Cksum Checksum	The 32-bit unsigned sum of the link-state advertisements' LS checksums.
No. of LSAs	The number of LSAs displayed.
Options	<p>EA – External Attribute LSA Support</p> <p>DC – Demand Circuit Support</p> <p>R – If clear, a node can participate in OSPF topology distribution without being used to forward transit traffic.</p> <p>N – Type 7 LSA Support</p> <p>MC – Multicast Support</p> <p>E – External Routes Support</p>

Show Commands

Label	Description (Continued)
	V6 — V6 works in conjunction with R. If V6 is clear, a node can participate in OSPF topology distribution without being used to forward IPv6 datagrams. If R is set and V6 is clear, IPv6 datagrams are not forwarded but diagrams belonging to another protocol family may be forwarded.
Prefix Options	<p>P — Propagate NSSA LSA.</p> <p>MC — Multicast support.</p> <p>LA — Lcal address capability. If set, the prefix is an IPv6 interface address of the advertising router.</p> <p>NU — No unicast capability. If set, the prefix is excluded from IPv6 unicast calculations.</p>
Flags	<p>None — No flags set</p> <p>V — The router is an endpoint for one or more fully adjacent Virtual Links having the described area as the transit area</p> <p>E — The router is an AS Boundary Router</p> <p>B — The router is an Area Border Router</p>
Link Count	The number of links advertised in the LSA.
Link Type (n)	The link type of the <i>n</i> th link in the LSA.
Network (n)	The network address of the <i>n</i> th link in the LSA.
Metric-0 (n)	The cost metric of the <i>n</i> th link in the LSA.

Sample Output

```
A:ALA-A# show router ospf 1 database

=====
Rtr Base OSPFv2 Instance 1 Link State Database (type : All)
=====
Area Id          Type      Link State Id  Adv Rtr Id    Age  Sequence      Cksum
-----
0.0.0.0          Router   180.0.0.2      180.0.0.2     1800 0x800000b6 0xf54
0.0.0.0          Router   180.0.0.5      180.0.0.5     1902 0x8000009d 0xcb7c
0.0.0.0          Router   180.0.0.8      180.0.0.8     1815 0x8000009a 0x529b
0.0.0.0          Router   180.0.0.9      180.0.0.9     1156 0x80000085 0xd00f
0.0.0.0          Router   180.0.0.10     180.0.0.10    533  0x8000009d 0x3f1f
0.0.0.0          Router   180.0.0.11     180.0.0.11    137  0x80000086 0xc58f
0.0.0.0          Router   180.0.0.12     180.0.0.12    918  0x8000009d 0x4cf3
0.0.0.0          Router   180.0.0.13     180.0.0.13    1401 0x800000a2 0x879c
0.0.0.0          Network 180.0.53.28    180.0.0.28    149  0x80000083 0xe5cd
0.0.0.0          Network 180.0.54.28    180.0.0.28    1259 0x80000083 0xdad7
0.0.0.0          Summary 180.0.0.15     180.0.0.10    378  0x80000084 0xeba1
0.0.0.0          Summary 180.0.0.15     180.0.0.12    73   0x80000084 0xdfab
0.0.0.0          Summary 180.0.0.18     180.0.0.10    1177 0x80000083 0xcfbb
0.0.0.1          Summary 180.100.25.4   180.0.0.12    208  0x80000091 0x3049
```



```

0.0.0.1      AS Summ 180.0.0.8      180.0.0.10      824  0x80000084 0x3d07
0.0.0.1      AS Summ 180.0.0.8      180.0.0.12      1183 0x80000095 0x4bdf
0.0.0.1      AS Summ 180.0.0.9      180.0.0.10      244  0x80000082 0x73cb
n/a          AS Ext  7.1.0.0         180.0.0.23      1312 0x80000083 0x45e7
n/a          AS Ext  7.2.0.0         180.0.0.23      997  0x80000082 0x45e6
n/a          AS Ext  10.20.0.0        180.0.0.23      238  0x80000081 0x2d81
...

```

```
-----
No. of LSAs: 339
=====
```

```
A:ALA-A# show router ospf 1 database detail
```

```
-----
Rtr Base OSPFv2 Instance 1 Link State Database (type : All) (detail)
-----
```

```
Router LSA for Area 0.0.0.0
-----
```

```

Area Id           : 0.0.0.0           Adv Router Id    : 180.0.0.2
Link State Id     : 180.0.0.2         LSA Type        : Router
Sequence No      : 0x800000b7        Checksum        : 0xd55
Age              : 155                Length          : 192
Options          : E
Flags            : None               Link Count      : 14
Link Type (1)    : Point To Point
Nbr Rtr Id (1)  : 180.0.0.13         I/F Address (1) : 180.0.22.2
No of TOS (1)   : 0                  Metric-0 (1)    : 25
Link Type (2)    : Stub Network
Network (2)     : 180.0.22.0         Mask (2)        : 255.255.255.0
No of TOS (2)   : 0                  Metric-0 (2)    : 25
Link Type (3)    : Point To Point
Nbr Rtr Id (3)  : 180.0.0.12         I/F Address (3) : 180.0.5.2
No of TOS (3)   : 0                  Metric-0 (3)    : 25
Link Type (4)    : Stub Network
Network (4)     : 180.0.5.0          Mask (4)        : 255.255.255.0
No of TOS (4)   : 0                  Metric-0 (4)    : 25
Link Type (5)    : Point To Point
Nbr Rtr Id (5)  : 180.0.0.8          I/F Address (5) : 180.0.13.2
No of TOS (5)   : 0                  Metric-0 (5)    : 6
Link Type (6)    : Stub Network
Network (6)     : 180.0.13.0        Mask (6)        : 255.255.255.0
No of TOS (6)   : 0                  Metric-0 (6)    : 6
Link Type (7)    : Point To Point
Nbr Rtr Id (7)  : 180.0.0.5          I/F Address (7) : 180.0.14.2
No of TOS (7)   : 0                  Metric-0 (7)    : 6
Link Type (8)    : Stub Network
Network (8)     : 180.0.14.0        Mask (8)        : 255.255.255.0
No of TOS (8)   : 0                  Metric-0 (8)    : 6
Link Type (9)    : Point To Point
Nbr Rtr Id (9)  : 180.0.0.11         I/F Address (9) : 180.0.17.2
No of TOS (9)   : 0                  Metric-0 (9)    : 25
Link Type (10)   : Stub Network
Network (10)    : 180.0.17.0        Mask (10)       : 255.255.255.0
No of TOS (10)  : 0                  Metric-0 (10)   : 25
Link Type (11)   : Stub Network
Network (11)    : 180.0.0.2          Mask (11)       : 255.255.255.255
No of TOS (11)  : 0                  Metric-0 (11)   : 1
Link Type (12)   : Stub Network
Network (12)    : 180.0.18.0        Mask (12)       : 255.255.255.0

```

Show Commands

```

No of TOS (12) : 0
Link Type (13) : Point To Point
Nbr Rtr Id (13) : 180.0.0.10
No of TOS (13) : 0
Link Type (14) : Stub Network
Network (14) : 180.0.3.0
No of TOS (14) : 0
Metric-0 (12) : 24
I/F Address (13) : 180.0.3.2
Metric-0 (13) : 25
Mask (14) : 255.255.255.0
Metric-0 (14) : 25

```

```
-----
AS Ext LSA for Network 180.0.0.14
-----
```

```

Area Id : N/A
Link State Id : 180.0.0.14
Sequence No : 0x80000083
Age : 2033
Options : E
Network Mask : 255.255.255.255
Metric Type : Type 2
Ext Route Tag : 0
Adv Router Id : 180.0.0.10
LSA Type : AS Ext
Checksum : 0xa659
Length : 36
Fwding Address : 180.1.6.15
Metric-0 : 4

```

```
-----
A:ALA-A#
```

interface

Syntax `interface [ip-addr | ip-int-name | area area-id] [detail]`

Context `show>router>ospf`
`show>router>ospf3`

Description Displays the details of the OSPF interface, this interface can be identified by ip-address or ip interface name. When neither is specified, all in-service interfaces are displayed.

The **detail** option produces a great amount of data. It is recommended to detail only when requesting a specific interface.

Parameters *ip-addr* — Display only the interface identified by this IP address.

ip-int-name — Display only the interface identified by this interface name.

area *area-id* — Display all interfaces configured in this area.

detail — Displays detailed information on the interface.

Output **Standard OSPF Interface Output** — The following table describes the standard command output fields for an OSPF interface.

Label	Description
If Name	The interface name.
Area Id	A 32-bit integer uniquely identifying the area to which this interface is connected. Area ID 0.0.0.0 is used for the OSPF backbone.

Label	Description (Continued)
D Rtr Id	The IP Interface address of the router identified as the Designated Router for the network in which this interface is configured. Set to 0.0.0.0 if there is no Designated router.
BD Rtr Id	The IP Interface address of the router identified as the Backup Designated Router for the network in which this interface is configured. Set to 0.0.0.0 if there is no Backup Designated router.
Adm	Dn – OSPF on this interface is administratively shut down. Up – OSPF on this interface is administratively enabled.
Opr	Down – This is the initial interface state. In this state, the lower-level protocols have indicated that the interface is unusable. Wait – The router is trying to determine the identity of the (Backup) Designated router for the network. PTOP – The interface is operational, and connects either to a physical point-to-point network or to a virtual link. DR – This router is the Designated Router for this network. BDR – This router is the backup Designated Router for this network. ODR – The interface is operational and part of a broadcast or NBMA network on which another router has been selected to be the Designated Router.
No. of OSPF Interfaces	The number of interfaces listed.

Sample Output

```
*A:Dut-C# show router ospf interface "system"
=====
Rtr Base OSPFv2 Instance 0 Interface "system"
=====
If Name          Area Id          Designated Rtr  Bkup Desig Rtr  Adm  Oper
-----
system           0.0.0.0          10.20.1.3      0.0.0.0         Up   DR
-----
No. of OSPF Interfaces: 1
=====
*A:Dut-C# show router ospf interface "system" detail
=====
Rtr Base OSPFv2 Instance 0 Interface "system" (detailed)
=====
Configuration
-----
```

Show Commands

```
IP Address      : 10.20.1.3
node sid index  : 33
Area Id        : 0.0.0.0          Priority      : 1
Hello Intrvl   : 5 sec           Rtr Dead Intrvl : 15 sec
Retrans Intrvl : 5 sec           Poll Intrvl    : 120 sec
Cfg Metric     : 0               Advert Subnet   : True
Transit Delay  : 1               Cfg IF Type    : None
Passive        : True            Cfg MTU        : 0
LSA-filter-out : None            Adv Rtr Capab  : Yes
LFA            : Include         LFA NH Template :
RIB-priority   : None
Auth Type      : None
-----
State
-----
Admin Status    : Enabled          Oper State      : Designated Rtr
Designated Rtr  : 10.20.1.3        Backup Desig Rtr : 0.0.0.0
IF Type         : Broadcast        Network Type     : Stub
Oper MTU        : 1500             Last Enabled    : 05/27/2015 08:35:53
Oper Metric     : 0                Bfd Enabled     : No
Te Metric       : 0                Te State        : Down
Admin Groups    : None
Ldp Sync        : outOfService     Ldp Sync Wait   : Disabled
Ldp Timer State : Disabled         Ldp Tm Left     : 0
-----
Statistics
-----
Nbr Count       : 0                If Events       : 4
Tot Rx Packets  : 0                Tot Tx Packets  : 0
Rx Hellos       : 0                Tx Hellos       : 0
Rx DBDs         : 0                Tx DBDs         : 0
Rx LSRs         : 0                Tx LSRs         : 0
Rx LSUs         : 0                Tx LSUs         : 0
Rx LS Acks      : 0                Tx LS Acks      : 0
Retransmits     : 0                Discards        : 0
Bad Networks    : 0                Bad Virt Links  : 0
Bad Areas       : 0                Bad Dest Addrs  : 0
Bad Auth Types  : 0                Auth Failures   : 0
Bad Neighbors   : 0                Bad Pkt Types   : 0
Bad Lengths     : 0                Bad Hello Int.  : 0
Bad Dead Int.   : 0                Bad Options     : 0
Bad Versions    : 0                Bad Checksums   : 0
LSA Count       : 0                LSA Checksum    : 0x0
=====
*A:Dut-C#

*A:Dut-C# show router ospf 1 interface "DUTC_TO_DUTB.1.0"

=====
Rtr Base OSPFv2 Instance 1 Interface "DUTC_TO_DUTB.1.0"
=====
If Name          Area Id          Designated Rtr  Bkup Desig Rtr  Adm  Oper
-----
DUTC_TO_DUTB.1.0  0.0.0.0         0.0.0.0        0.0.0.0         Up   PToP
-----
No. of OSPF Interfaces: 1
=====

*A:Dut-C# show router ospf 1 interface "DUTC_TO_DUTB.1.0" detail
```

```

=====
Rtr Base OSPFv2 Instance 1 Interface "DUTC_TO_DUTB.1.0" (detailed)
=====
-----
Configuration
-----
IP Address       : 1.0.23.3
Area Id          : 0.0.0.0
Hello Intrvl    : 2 sec
Retrans Intrvl  : 5 sec
Cfg Metric      : 7000
Transit Delay   : 1
Passive         : False
LSA-filter-out  : None
LFA             : Include
Auth Type       : None
Priority         : 1
Rtr Dead Intrvl : 10 sec
Poll Intrvl    : 120 sec
Advert Subnet   : True
Cfg IF Type     : Point To Point
Cfg MTU         : 0
Adv Rtr Capab  : Yes
LFA NH Template : template1
-----
State
-----
Admin Status    : Enabled
Designated Rtr : 0.0.0.0
IF Type         : Point To Point
Oper MTU        : 1500
Oper Metric     : 7000
Te Metric       : 7000
Admin Groups    : None
Ldp Sync        : outOfService
Ldp Timer State : Disabled
Oper State      : Point To Point
Backup Desig Rtr : 0.0.0.0
Network Type    : Transit
Last Enabled    : 01/14/2014 14:33:07
Bfd Enabled     : No
Te State        : Down
Ldp Sync Wait   : Disabled
Ldp Tm Left     : 0
-----
Statistics
-----
Nbr Count      : 1
Tot Rx Packets : 603
Rx Hellos      : 576
Rx DBDs        : 3
Rx LSRs        : 0
Rx LSUs        : 15
Rx LS Acks     : 9
Retransmits    : 2
Bad Networks   : 0
Bad Areas      : 0
Bad Auth Types : 0
Bad Neighbors  : 0
Bad Lengths    : 0
Bad Dead Int.  : 1
Bad Versions   : 0
LSA Count      : 0
If Events      : 1
Tot Tx Packets : 602
Tx Hellos      : 577
Tx DBDs        : 2
Tx LSRs        : 1
Tx LSUs        : 16
Tx LS Acks     : 6
Discards       : 2
Bad Virt Links : 0
Bad Dest Addrs : 0
Auth Failures  : 0
Bad Pkt Types  : 0
Bad Hello Int. : 1
Bad Options    : 0
Bad Checksums  : 0
LSA Checksum   : 0x0
=====
*A:Dut-C#

A:SetupCLI# show router ospf 1 interface "ip_if_1" detail

=====
Rtr Base OSPFv2 Instance 1 Interface "ip_if_1" (detail)
=====
-----
Configuration
-----

```

Show Commands

```
IP Address      : 10.10.1.1
Area Id         : 0.0.0.0
Hello Intrvl   : 9 sec
Retrans Intrvl : 10 sec
Cfg Metric      : 11
Transit Delay  : 2
Passive        : False
LFA            : Exclude
IPsec InStatSA :
IPsec InStatSATmp:
```

State

```
Admin Status    : Enabled
Designated Rtr  : 0.0.0.0
IF Type         : Secondary
Oper MTU        : 1576
Oper Metric     : 11
Te Metric       : 16777215
Admin Groups    : None
Ldp Sync        : outOfService
Ldp Timer State : Disabled
Oper State      : Down
Backup Desig Rtr : 0.0.0.0
Network Type    : Stub
Last Enabled    : Never
Bfd Enabled     : No
Te State        : Down
Ldp Sync Wait   : Disabled
Ldp Tm Left     : 0
```

Statistics

```
Nbr Count       : 0
Tot Rx Packets  : 0
Rx Hellos       : 0
Rx DBDs         : 0
Rx LSRs         : 0
Rx LSUs         : 0
Rx LS Acks      : 0
Retransmits     : 0
Bad Networks    : 0
Bad Areas       : 0
Bad Auth Types  : 0
Bad Neighbors   : 0
Bad Lengths     : 0
Bad Dead Int.   : 0
Bad Versions    : 0
LSA Count       : 0
If Events       : 0
Tot Tx Packets  : 0
Tx Hellos       : 0
Tx DBDs         : 0
Tx LSRs         : 0
Tx LSUs         : 0
Tx LS Acks      : 0
Discards        : 0
Bad Virt Links  : 0
Bad Dest Addr   : 0
Auth Failures   : 0
Bad Pkt Types   : 0
Bad Hello Int.  : 0
Bad Options     : 0
Bad Checksums   : 0
LSA Checksum    : 0x0
```

Configuration

```
IP Address      : 10.10.1.1
Area Id         : 1.1.1.1
Hello Intrvl   : 9 sec
Retrans Intrvl : 10 sec
Cfg Metric      : 11
Transit Delay  : 2
Passive        : False
LFA            : Exclude
IPsec InStatSA :
IPsec InStatSATmp:
```

State

```
Admin Status    : Enabled
Designated Rtr  : 0.0.0.0
Oper State      : Down
Backup Desig Rtr : 0.0.0.0
```

```

IF Type           : Point To Point      Network Type      : Stub
Oper MTU          : 1576                 Last Enabled     : Never
Oper Metric       : 11                   Bfd Enabled      : No
Te Metric         : 16777215            Te State        : Down
Admin Groups     : None
Ldp Sync         : outOfService          Ldp Sync Wait   : Disabled
Ldp Timer State  : Disabled              Ldp Tm Left    : 0

```

Statistics

```

Nbr Count        : 0                    If Events        : 0
Tot Rx Packets   : 0                    Tot Tx Packets   : 0
Rx Hellos        : 0                    Tx Hellos        : 0
Rx DBDs          : 0                    Tx DBDs          : 0
Rx LSRs          : 0                    Tx LSRs          : 0
Rx LSUs          : 0                    Tx LSUs          : 0
Rx LS Acks       : 0                    Tx LS Acks       : 0
Retransmits      : 0                    Discards         : 0
Bad Networks     : 0                    Bad Virt Links   : 0
Bad Areas        : 0                    Bad Dest Adrs    : 0
Bad Auth Types   : 0                    Auth Failures    : 0
Bad Neighbors    : 0                    Bad Pkt Types    : 0
Bad Lengths      : 0                    Bad Hello Int.   : 0
Bad Dead Int.    : 0                    Bad Options      : 0
Bad Versions     : 0                    Bad Checksums    : 0
LSA Count        : 0                    LSA Checksum     : 0x0

```

A:SetupCLI#

A:SetupCLI# **show router ospf 1 interface area 1.1.1.1 detail**

Rtr Base OSPFv2 Instance 1 Interfaces in area 1.1.1.1 (detail)

Interface : ip_if_1

```

IP Address       : 10.10.1.1
Area Id          : 1.1.1.1              Priority          : 10
Hello Intrvl    : 9 sec                 Rtr Dead Intrvl : 45 sec
Retrans Intrvl  : 10 sec                Poll Intrvl     : 120 sec
Cfg Metric      : 11                    Advert Subnet    : False
Transit Delay   : 2                     Auth Type       : MD5
Passive         : False                  Cfg MTU         : 9198
LFA             : Exclude
IPsec InStatSA  :                       IPsec OutStatSA :
IPsec InStatSATmp:
Admin Status    : Enabled                Oper State       : Down
Designated Rtr : 0.0.0.0                Backup Desig Rtr : 0.0.0.0
IF Type        : Point To Point          Network Type     : Stub
Oper MTU       : 1576                    Last Enabled    : Never
Oper Metric    : 11                       Bfd Enabled     : No
Te Metric      : 16777215                 Te State        : Down
Admin Groups   : None
Ldp Sync       : outOfService             Ldp Sync Wait   : Disabled
Ldp Timer State : Disabled                Ldp Tm Left    : 0
Nbr Count      : 0                        If Events        : 0
Tot Rx Packets : 0                        Tot Tx Packets   : 0
Rx Hellos      : 0                        Tx Hellos        : 0

```

Show Commands

```
Rx DBDs          : 0          Tx DBDs          : 0
Rx LSRs          : 0          Tx LSRs          : 0
Rx LSUs          : 0          Tx LSUs          : 0
Rx LS Acks       : 0          Tx LS Acks       : 0
Retransmits      : 0          Discards         : 0
Bad Networks     : 0          Bad Virt Links   : 0
Bad Areas        : 0          Bad Dest Addrs   : 0
Bad Auth Types   : 0          Auth Failures    : 0
Bad Neighbors    : 0          Bad Pkt Types    : 0
Bad Lengths      : 0          Bad Hello Int.   : 0
Bad Dead Int.    : 0          Bad Options      : 0
Bad Versions     : 0          Bad Checksums    : 0
LSA Count        : 0          LSA Checksum     : 0x0
```

```
=====  
A:SetupCLI#
```

```
A:SetupCLI# show router ospf 1 interface detail
```

```
=====  
Rtr Base OSPFv2 Instance 1 Interfaces (detail)  
=====
```

```
-----  
Interface : system  
-----
```

```
IP Address       : 9.1.255.255
Area Id          : 0.0.0.0          Priority         : 1
Hello Intrvl    : 10 sec           Rtr Dead Intrvl : 40 sec
Retrans Intrvl  : 5 sec           Poll Intrvl     : 120 sec
Cfg Metric      : 0               Advert Subnet    : True
Transit Delay   : 1               Auth Type       : None
Passive         : True            Cfg MTU         : 0
Admin Status    : Enabled         Oper State      : Designated Rtr
Designated Rtr  : 2.2.2.2         Backup Desig Rtr : 0.0.0.0
IF Type         : Broadcast        Network Type     : Transit
Oper MTU        : 1500            Last Enabled    : 05/14/2006 09:16:26
Oper Metric     : 0               Bfd Enabled     : No
Nbr Count       : 0               If Events       : 5
Tot Rx Packets  : 0               Tot Tx Packets  : 0
Rx Hellos       : 0               Tx Hellos       : 0
Rx DBDs         : 0               Tx DBDs         : 0
Rx LSRs         : 0               Tx LSRs         : 0
Rx LSUs         : 0               Tx LSUs         : 0
Rx LS Acks      : 0               Tx LS Acks      : 0
Retransmits     : 0               Discards        : 0
Bad Networks    : 0               Bad Virt Links  : 0
Bad Areas       : 0               Bad Dest Addrs  : 0
Bad Auth Types  : 0               Auth Failures   : 0
Bad Neighbors   : 0               Bad Pkt Types   : 0
Bad Lengths     : 0               Bad Hello Int.  : 0
Bad Dead Int.   : 0               Bad Options     : 0
Bad Versions    : 0               Bad Checksums   : 0
LSA Count       : 0               LSA Checksum    : 0x0
```

```
-----  
Interface : sender  
-----
```

```
IP Address       : 11.1.1.1
Area Id          : 0.0.0.0          Priority         : 1
Hello Intrvl    : 10 sec           Rtr Dead Intrvl : 40 sec
Retrans Intrvl  : 5 sec           Poll Intrvl     : 120 sec
```



```

Cfg Metric      : 0                Advert Subnet   : True
Transit Delay   : 1                Auth Type      : None
Passive         : False             Cfg MTU        : 0

```

```

=====
A:SetupCLI#

```

Detailed OSPF Interface Output — The following table describes the detailed command output fields for an OSPF interface.

Label	Description
Interface	The IP address of this OSPF interface.
IP Address	The IP address and mask of this OSPF interface.
Interface Name	The interface name.
Area Id	A 32-bit integer uniquely identifying the area to which this interface is connected. Area ID 0.0.0.0 is used for the OSPF backbone.
Priority	The priority of this interface. Used in multi-access networks, this field is used in the designated router election algorithm.
Hello Intrvl	The length of time, in seconds, between the Hello packets that the router sends on the interface. This value must be the same for all routers attached to a common network.
Rtr Dead Intrvl	The number of seconds that a router's Hello packets have not been seen before it's neighbors declare the router down. This should be some multiple of the Hello interval. This value must be the same for all routers attached to a common network.
Retrans Intrvl	The number of seconds between link-state advertisement retransmissions, for adjacencies belonging to this interface. This value is also used when retransmitting database description and link-state request packets.
Poll Intrvl	The larger time interval, in seconds, between the Hello packets sent to an inactive non-broadcast multi-access neighbor.
Metric	The metric to be advertised for this interface.
Advert Subnet	False — When a point-to-point interface is configured as false, then the subnet is not advertised and the endpoints are advertised as host routes. True — When a point-to-point interface is configured to true, then the subnet is advertised.
Transit Delay	The estimated number of seconds it takes to transmit a link state update packet over this interface.
Auth Type	Identifies the authentication procedure to be used for the packet.

Label	Description (Continued)
	<p>None — Routing exchanges over the network/subnet are not authenticated.</p> <p>Simple — A 64-bit field is configured on a per-network basis. All packets sent on a particular network must have this configured value in their OSPF header 64-bit authentication field. This essentially serves as a “clear” 64-bit password.</p> <p>MD5 — A shared secret key is configured in all routers attached to a common network/subnet. For each OSPF protocol packet, the key is used to generate/verify a “message digest” that is appended to the end of the OSPF packet.</p>
Passive	<p>False — This interfaces operates as a normal OSPF interface with regard to adjacency forming and network/link behavior.</p> <p>True — no OSPF HELLOs will be sent out on this interface and the router advertises this interface as a stub network/link in its router LSAs.</p>
MTU	<p>The desired size of the largest packet which can be sent/received on this OSPF interface, specified in octets. This size DOES include the underlying IP header length, but not the underlying layer headers/trailers.</p>
Admin Status	<p>Disabled — OSPF on this interface is administratively shut down.</p> <p>Enabled — OSPF on this interface is administratively enabled.</p>
Oper State	<p>Down — This is the initial interface state. In this state, the lower-level protocols have indicated that the interface is unusable.</p> <p>Waiting — The router is trying to determine the identity of the (Backup) Designated router for the network.</p> <p>Point To Point — The interface is operational, and connects either to a physical point-to-point network or to a virtual link.</p> <p>Designated Rtr — This router is the Designated Router for this network.</p> <p>Other Desig Rtr — The interface is operational and part of a broadcast or NBMA network on which another router has been selected to be the Designated Router.</p> <p>Backup Desig Rtr — This router is the Backup Designated Router for this network.</p>
DR-Id	<p>The IP Interface address of the router identified as the Designated Router for the network in which this interface is configured. Set to 0.0.0.0 if there is no Designated router</p>

Label	Description (Continued)
BDR-Id	The IP Interface address of the router identified as the Backup Designated Router for the network in which this interface is configured. Set to 0.0.0.0 if there is no Backup Designated router.
IF Type	Broadcast – LANs, such as Ethernet. NBMA – X.25, Frame Relay and similar technologies. Point-To-Point – Links that are definitively point to point.
Network Type	Stub – OPSF has not established a neighbor relationship with any other OSPF router on this network as such only traffic sourced or destined to this network will be routed to this network. Transit – OPSF has established at least one neighbor relationship with any other OSPF router on this network as such traffic en route to other networks may be routed via this network.
Oper MTU	The operational size of the largest packet which can be sent/received on this OSPF interface, specified in octets. This size DOES include the underlying IP header length, but not the underlying layer headers/trailers.
Last Enabled	The time that this interface was last enabled to run OSPF on this interface.
Nbr Count	The number of OSPF neighbors on the network for this interface.
If Events	The number of times this OSPF interface has changed its state, or an error has occurred since this interface was last enabled.
Tot Rx Packets	The total number of OSPF packets received on this interface since this interface was last enabled.
Tot Tx Packets	The total number of OSPF packets transmitted on this interface since this interface was last enabled.
Rx Hellos	The total number of OSPF Hello packets received on this interface since this interface was last enabled.
Tx Hellos	The total number of OSPF Hello packets transmitted on this interface since this interface was last enabled.
Rx DBDs	The total number of OSPF database description packets received on this interface since this interface was last enabled.
Tx DBDs	The total number of OSPF database description packets transmitted on this interface since this interface was last enabled.
Rx LSRs	The total number of Link State Requests (LSRs) received on this interface since this interface was last enabled.

Show Commands

Label	Description (Continued)
Tx LSRS	The total number of Link State Requests (LSRs) transmitted on this interface since this interface was last enabled.
Rx LSUs	The total number of Link State Updates (LSUs) received on this interface since this interface was last enabled.
Tx LSUs	The total number of Link State Updates (LSUs) transmitted on this interface since this interface was last enabled.
Rx LS Acks	The total number of Link State Acknowledgements received on this interface since this interface was last enabled.
Tx LS Acks	The total number of Link State Acknowledgements transmitted on this interface since this interface was last enabled.
Retransmits	The total number of OSPF Retransmits sent on this interface since this interface was last enabled.
Discards	The total number of OSPF packets discarded on this interface since this interface was last enabled.
Bad Networks	The total number of OSPF packets received with invalid network or mask since this interface was last enabled.
Bad Virt Links	The total number of OSPF packets received on this interface that are destined to a virtual link that does not exist since this interface was last enabled.
Bad Areas	The total number of OSPF packets received with an area mismatch since this interface was last enabled.
Bad Dest Addr	The total number of OSPF packets received with the incorrect IP destination address since this interface was last enabled.
Bad Auth Types	The total number of OSPF packets received with an invalid authorization type since this interface was last enabled.
Auth Failures	The total number of OSPF packets received with an invalid authorization key since this interface was last enabled.
Bad Neighbors	The total number of OSPF packets received where the neighbor information does not match the information this router has for the neighbor since this interface was last enabled.
Bad Pkt Types	The total number of OSPF packets received with an invalid OSPF packet type since this interface was last enabled.
Bad Lengths	The total number of OSPF packets received on this interface with a total length not equal to the length given in the packet itself since this interface was last enabled.

Label	Description (Continued)
Bad Hello int.	The total number of OSPF packets received where the hello interval given in packet was not equal to that configured on this interface since this interface was last enabled.
Bad Dead Int.	The total number of OSPF packets received where the dead interval given in the packet was not equal to that configured on this interface since this interface was last enabled.
Bad Options	The total number of OSPF packets received with an option that does not match those configured for this interface or area since this interface was last enabled.
Bad Versions	The total number of OSPF packets received with bad OSPF version numbers since this interface was last enabled.
Te Metric	Indicates the TE metric configured for this interface. This metric is flooded out in the TE metric sub-tlv in the OSPF TE LSAs. Depending on the configuration, either the TE metric value or the native OSPF metric value is used in CSPF computations.
Te State	Indicates the MPLS interface TE status from OSPF standpoint.
Admin Groups	Indicates the bit-map inherited from MPLS interface that identifies the admin groups to which this interface belongs.
Ldp Sync	Specifies whether the IGP-LDP synchronization feature is enabled or disabled on all interfaces participating in the OSPF routing protocol.
Ldp Sync Wait	Indicates the time to wait for the LDP adjacency to come up.
Ldp Timer State	Indicates the state of the LDP sync time left on the OSPF interface.
Ldp Tm Left	Indicates the time left before OSPF reverts back to advertising normal metric for this interface.

Sample Output

```
*A:JC-NodeA# show router ospf 1 interface area 1 detail
```

```
=====
Rtr Base OSPFv2 Instance 1 Interfaces in area 1 (detail)
=====
```

```
Interface : ip-10.10.1.1
-----
```

```
IP Address       : 10.10.1.1
Area Id          : 0.0.0.1
Hello Intrvl     : 5 sec
Retrans Intrvl   : 5 sec
Cfg Metric       : 0
Transit Delay    : 1
Priority         : 1
Rtr Dead Intrvl : 15 sec
Poll Intrvl     : 120 sec
Advert Subnet    : True
Auth Type       : None
```

Show Commands

```
Passive           : False
Admin Status      : Enabled
Designated Rtr   : 10.20.1.1
IF Type           : Broadcast
Oper MTU          : 1500
Oper Metric       : 1000
Nbr Count         : 0
Tot Rx Packets   : 0
Rx Hellos         : 0
Rx DBDs           : 0
Rx LSRs          : 0
Rx LSUs          : 0
Rx LS Acks       : 0
Retransmits      : 0
Bad Networks     : 0
Bad Areas        : 0
Bad Auth Types   : 0
Bad Neighbors    : 0
Bad Lengths      : 0
Bad Dead Int.    : 0
Bad Versions     : 0
LSA Count        : 0
TE Metric        : 678

Cfg MTU           : 0
Oper State        : Designated Rtr
Backup Desig Rtr : 0.0.0.0
Network Type     : Transit
Last Enabled     : 04/11/2007 16:06:27
Bfd Enabled      : No
If Events        : 5
Tot Tx Packets   : 1116
Tx Hellos        : 1116
Tx DBDs          : 0
Tx LSRs          : 0
Tx LSUs          : 0
Tx LS Acks       : 0
Discards         : 0
Bad Virt Links   : 0
Bad Dest Addrs   : 0
Auth Failures    : 0
Bad Pkt Types    : 0
Bad Hello Int.   : 0
Bad Options      : 0
Bad Checksums    : 0
LSA Checksum     : 0x0
```

```
=====
*A:JC-NodeA#
```

lfa-coverage

Syntax lfa-coverage

Context show>router>ospf

Description This command displays OSPF Loop-Free Alternate (LFA) next-hop information.

Sample Output

```
*A:Dut-A# show router ospf 1 lfa-coverage
```

```
=====
Rtr Base OSPFv2 Instance 1 LFA Coverage
=====
```

Area	Node	Prefix
0.0.0.0	4/4 (100%)	8/8 (100%)

```
=====
*A:Dut-A#
```

neighbor

Syntax `neighbor [ip-int-name] [router-id]`

Context show>router>ospf
show>router>ospf3

Description This command will display all neighbor information. To reduce the amount of output the user may opt to select the neighbors on a given interface by address or name.

The **detail** option produces a large amount of data. It is recommended to use **detail** only when requesting a specific neighbor.

Parameters *ip-int-name* — Display neighbor information only for neighbors of the interface identified by the interface name

router-id — Display neighbor information for the neighbor identified by the the specified router ID.

Output **Standard OSPF Neighbor Output** — The following table describes the standard command output fields for an OSPF neighbor.

Label	Description
Nbr IP Addr	The IP address this neighbor is using in its IP Source Address. Note that, on addressless links, this will not be 0.0.0.0, but the address of another of the neighbor's interfaces.
Nbr Rtr Id	A 32-bit integer uniquely identifying the neighboring router in the Autonomous System.
Nbr State	<p>Down — This is the initial state of a neighbor conversation. It indicates that there has been no recent information received from the neighbor.</p> <p>Attempt — This state is only valid for neighbors attached to NBMA networks. It indicates that no recent information has been received from the neighbor, but that a more concerted effort should be made to contact the neighbor.</p> <p>Init — In this state, an Hello packet has recently been seen from the neighbor. However, bidirectional communication has not yet been established with the neighbor (i.e., the router itself did not appear in the neighbor's Hello packet).</p> <p>Two Way — In this state, communication between the two routers is bidirectional.</p> <p>ExchStart — This is the first step in creating an adjacency between the two neighboring routers. The goal of this step is to decide which router is the master, and to decide upon the initial Database Descriptor sequence number.</p> <p>Exchange — In this state the router is describing its entire link state database by sending Database Description packets to the neighbor.</p>

Label	Description (Continued)
	<p>Loading — In this state, Link State Request packets are sent to the neighbor asking for the more recent LSAs that have been discovered (but not yet received) in the Exchange state.</p> <p>Full — In this state, the neighboring routers are fully adjacent. These adjacencies will now appear in router-LSAs and network-LSAs.</p>
Priority	The priority of this neighbor in the designated router election algorithm. The value 0 signifies that the neighbor is not eligible to become the designated router on this particular network.
RetxQ Len	The current length of the retransmission queue.
Dead Time	The time until this neighbor is declared down, this timer is set to the dead router interval when a valid hello packet is received from the neighbor.
No. of Neighbors	The number of adjacent OSPF neighbors on this interface.

Sample Output

```
A:ALA-A# show router ospf 1 neighbor
=====
Rtr Base OSPFv2 Instance 1 Neighbors
=====
Interface-Name          Rtr Id          State    Pri  RetxQ  TTL
-----
pc157-2/1                10.13.8.158    Full     1    0      37
pc157-2/2                10.13.7.165    Full    100  0      33
pc157-2/3                10.13.6.188    Full     1    0      38
-----
No. of Neighbors: 3
=====
A:ALA-A#
```

Detailed OSPF Neighbor Output — The following table describes the detailed command output fields for an OSPF neighbor.

Label	Description
Neighbor IP Addr	The IP address this neighbor is using in its IP source address. Note that, on addressless links, this will not be 0.0.0.0, but the address of another of the neighbor's interfaces.
Local IF IP Addr	The IP address of this OSPF interface.
Area Id	A 32-bit integer uniquely identifying the area to which this interface is connected. Area ID 0.0.0.0 is used for the OSPF backbone

Label	Description (Continued)
Designated Rtr	The IP Interface address of the router identified as the Designated Router for the network in which this interface is configured. Set to 0.0.0.0 if there is no Designated router.
Neighbor Rtr Id	A 32-bit integer uniquely identifying the neighboring router in the AS.
Neighbor State	<p>Down — This is the initial state of a neighbor conversation. It indicates that there has been no recent information received from the neighbor</p> <p>Attempt — This state is only valid for neighbors attached to NBMA networks. It indicates that no recent information has been received from the neighbor, but that a more concerted effort should be made to contact the neighbor.</p> <p>Init — In this state, an Hello packet has recently been seen from the neighbor. However, bidirectional communication has not yet been established with the neighbor (i.e., the router itself did not appear in the neighbor's Hello packet).</p> <p>Two Way — In this state, communication between the two routers is bidirectional.</p> <p>Exchange start — This is the first step in creating an adjacency between the two neighboring routers. The goal of this step is to decide which router is the master, and to decide upon the initial Database Descriptor sequence number.</p> <p>Exchange — In this state the router is describing its entire link state database by sending Database Description packets to the neighbor</p> <p>Loading — In this state, Link State Request packets are sent to the neighbor asking for the more recent LSAs that have been discovered (but not yet received) in the Exchange state.</p> <p>Full — In this state, the neighboring routers are fully adjacent. These adjacencies will now appear in router-LSAs and network-LSAs.</p>
Priority	The priority of this neighbor in the designated router election algorithm. The value 0 signifies that the neighbor is not eligible to become the designated router on this particular network.
Retrans Q Length	The current length of the retransmission queue.
Options	<p>E — External Routes Support</p> <p>MC — Multicast Support</p> <p>N/P — Type 7 LSA Support</p> <p>EA — External Attribute LSA Support</p>

Show Commands

Label	Description (Continued)
	DC — Demand Circuit Support
	O — Opaque LSA Support
Backup Desig Rtr	The IP Interface address of the router identified as the Backup Designated Router for the network in which this interface is configured. Set to 0.0.0.0 if there is no backup designated router.
Events	The number of times this neighbor relationship has changed state, or an error has occurred.
Last Event Time	The time when the last event occurred that affected the adjacency to the neighbor.
Up Time	This value represents the uninterrupted time, in hundredths of seconds, the adjacency to this neighbor has been up. To evaluate when the last state change occurred see last event time.
Time Before Dead	The time until this neighbor is declared down, this timer is set to the dead router interval when a valid hello packet is received from the neighbor.
Bad Nbr States	The total number of OSPF packets received when the neighbor state was not expecting to receive this packet type since this interface was last enabled.
LSA Inst fails	The total number of times an LSA could not be installed into the LSDB due to a resource allocation issue since this interface was last enabled.
Bad Seq Nums	The total number of times when a database description packet was received with a sequence number mismatch since this interface was last enabled.
Bad MTUs	The total number of times when the MTU in a received database description packet was larger than the MTU of the receiving interface since this interface was last enabled.
Bad Packets	The total number of times when an LS update was received with an illegal LS type or an option mismatch since this interface was last enabled.
LSA not in LSDB	The total number of times when an LS request was received for an LSA not installed in the LSDB of this router since this interface was last enabled.
Option Mismatches	The total number of times when a LS update was received with an option mismatch since this interface was last enabled.
Nbr Duplicates	The total number of times when a duplicate database description packet was received during the exchange state since this interface was last enabled.

Sample Output

```
*A:Dut-C# show router ospf neighbor detail
```

```
=====
Rtr Base OSPFv2 Instance 0 Neighbors (detail)
=====
```

```
-----
Neighbor Rtr Id : 10.20.1.1 Interface: to_Dut-A
-----
```

```
Neighbor IP Addr : 1.1.3.1
Local IF IP Addr : 1.1.3.3
Area Id          : 0.0.0.1           Adj SR SID       : Label 262141
Designated Rtr  : 10.20.1.3         Backup Desig Rtr : 10.20.1.1
Neighbor State   : Full              Priority          : 1
Retrans Q Length : 0                 Options           : - E - - - - O --
Events           : 5                 Last Event Time  : 05/27/2015 08:36:02
Up Time          : 0d 00:11:01       Time Before Dead : 8 sec
GR Helper        : Not Helping       GR Helper Age    : 0 sec
GR Exit Reason   : None              GR Restart Reason: Unknown
Bad Nbr States   : 1                 LSA Inst fails  : 0
Bad Seq Nums     : 0                 Bad MTUs         : 0
Bad Packets      : 0                 LSA not in LSDB : 0
Option Mismatches : 0                Nbr Duplicates   : 0
Num Restarts     : 0                 Last Restart at  : Never
```

```
-----
Neighbor Rtr Id : 10.20.1.2 Interface: to_Dut-B1
-----
```

```
Neighbor IP Addr : 1.2.3.2
Local IF IP Addr : 1.2.3.3
Area Id          : 0.0.0.1           Adj SR SID       : Label 262139
Designated Rtr  : 10.20.1.3         Backup Desig Rtr : 10.20.1.2
Neighbor State   : Full              Priority          : 1
Retrans Q Length : 0                 Options           : - E - - - - O --
Events           : 6                 Last Event Time  : 05/27/2015 08:36:03
Up Time          : 0d 00:11:03       Time Before Dead : 10 sec
GR Helper        : Not Helping       GR Helper Age    : 0 sec
GR Exit Reason   : None              GR Restart Reason: Unknown
Bad Nbr States   : 1                 LSA Inst fails  : 0
Bad Seq Nums     : 0                 Bad MTUs         : 0
Bad Packets      : 0                 LSA not in LSDB : 0
Option Mismatches : 0                Nbr Duplicates   : 0
Num Restarts     : 0                 Last Restart at  : Never
```

```
-----
Neighbor Rtr Id : 10.20.1.2 Interface: to_Dut-B2
-----
```

```
Neighbor IP Addr : 2.2.3.2
Local IF IP Addr : 2.2.3.3
Area Id          : 0.0.0.0           Adj SR SID       : Label 262138
Designated Rtr  : 10.20.1.3         Backup Desig Rtr : 10.20.1.2
Neighbor State   : Full              Priority          : 1
Retrans Q Length : 0                 Options           : - E - - - - O --
Events           : 5                 Last Event Time  : 05/27/2015 08:36:03
Up Time          : 0d 00:11:01       Time Before Dead : 9 sec
GR Helper        : Not Helping       GR Helper Age    : 0 sec
GR Exit Reason   : None              GR Restart Reason: Unknown
Bad Nbr States   : 1                 LSA Inst fails  : 0
Bad Seq Nums     : 0                 Bad MTUs         : 0
Bad Packets      : 0                 LSA not in LSDB : 0
```

Show Commands

```
Option Mismatches: 0                Nbr Duplicates   : 0
Num Restarts      : 0                Last Restart at  : Never
-----
Neighbor Rtr Id   : 10.20.1.5       Interface: to_Dut-E
-----
Neighbor IP Addr  : 1.3.5.5
Local IF IP Addr  : 1.3.5.3
Area Id           : 0.0.0.0          Adj SR SID       : Label 262140
Designated Rtr    : 10.20.1.5       Backup Desig Rtr : 10.20.1.3
Neighbor State    : Full             Priority          : 1
Retrans Q Length  : 0                Options          : - E - - - - O --
Events            : 7                Last Event Time  : 05/27/2015 08:36:04
Up Time           : 0d 00:11:01      Time Before Dead : 8 sec
GR Helper         : Not Helping       GR Helper Age    : 0 sec
GR Exit Reason    : None              GR Restart Reason: Unknown
Bad Nbr States    : 0                LSA Inst fails   : 0
Bad Seq Nums     : 0                Bad MTUs         : 0
Bad Packets       : 0                LSA not in LSDB : 0
Option Mismatches: 0                Nbr Duplicates   : 0
Num Restarts      : 0                Last Restart at  : Never
=====
```

*A:Dut-C#

A:ALA-A# **show router ospf 1 neighbor detail**

```
=====
Rtr Base OSPFv2 Instance 1 Neighbors (detail)
-----
```

```
Neighbor Rtr Id   : 10.13.8.158     Interface: pc157-2/1
-----
Neighbor IP Addr  : 10.16.1.8
Local IF IP Addr  : 10.16.1.7
Area Id           : 0.0.0.0
Designated Rtr    : 0.0.0.0          Backup Desig Rtr : 0.0.0.0
Neighbor State    : Full             Priority          : 1
Retrans Q Length  : 0                Options          : -E--O-
Events            : 4                Last Event Time  : 05/06/2006 00:11:16
Up Time           : 1d 18:20:20      Time Before Dead : 38 sec
GR Helper         : Not Helping       GR Helper Age    : 0 sec
GR Exit Reason    : None              GR Restart Reason: Unknown
Bad Nbr States    : 1                LSA Inst fails   : 0
Bad Seq Nums     : 0                Bad MTUs         : 0
Bad Packets       : 0                LSA not in LSDB : 0
Option Mismatches: 0                Nbr Duplicates   : 0
Num Restarts      : 0                Last Restart at  : Never
-----
```

```
Neighbor Rtr Id   : 10.13.7.165     Interface: pc157-2/2
-----
Neighbor IP Addr  : 10.12.1.3
Local IF IP Addr  : 10.12.1.7
Area Id           : 0.0.0.0
Designated Rtr    : 10.13.9.157      Backup Desig Rtr : 10.13.7.165
Neighbor State    : Full             Priority          : 100
Retrans Q Length  : 0                Options          : -E--O-
Events            : 4                Last Event Time  : 05/05/2006 01:39:13
Up Time           : 0d 16:52:27      Time Before Dead : 33 sec
GR Helper         : Not Helping       GR Helper Age    : 0 sec
GR Exit Reason    : None              GR Restart Reason: Unknown
Bad Nbr States    : 0                LSA Inst fails   : 0
-----
```

```

Bad Seq Nums      : 0                Bad MTUs          : 0
Bad Packets       : 0                LSA not in LSDB  : 0
Option Mismatches: 0                Nbr Duplicates   : 0
Num Restarts     : 0                Last Restart at  : Never
-----
Neighbor Rtr Id  : 10.13.6.188      Interface: pc157-2/3
-----
Neighbor IP Addr : 10.14.1.4
Local IF IP Addr : 10.14.1.7
Area Id          : 0.0.0.0
Designated Rtr  : 10.13.9.157      Backup Desig Rtr : 10.13.6.188
Neighbor State  : Full              Priority          : 1
Retrans Q Length: 0                Options           : -E--O-
Events          : 4                Last Event Time  : 05/05/2006 08:35:18
Up Time         : 0d 09:56:25      Time Before Dead : 38 sec
GR Helper       : Not Helping      GR Helper Age    : 0 sec
GR Exit Reason  : None            GR Restart Reason: Unknown
Bad Nbr States  : 1                LSA Inst fails  : 0
Bad Seq Nums    : 0                Bad MTUs        : 0
Bad Packets     : 0                LSA not in LSDB: 0
Option Mismatches: 0                Nbr Duplicates  : 0
Num Restarts    : 0                Last Restart at  : Never
=====
A:ALA-A#

```

opaque-database

Syntax `opaque-database [link link-id | area area-id [as] [adv-router router-id] [ls-id] [detail]`

Context show>router>ospf

Description This command displays OSPF opaque database information.

Output **OSPF Opaque Database Output** — The following table describes the OSPF opaque database output fields.

Label	Description
Area Id	A 32-bit integer uniquely identifying an area. Area ID 0.0.0.0 is used for the OSPF backbone.
Type	NSSA — This area is configured as a NSSA area. Area — This area is configured as a standard area (not NSSA or stub). Stub — This area is configured as a NSSA area.
Link State Id	The link state ID is an LSA type specific field containing either a Router-Id or an IP Address; it identifies the piece of the routing domain being described by the advertisement.
Adv Rtr Id	The router identifier of the router advertising the LSA.
Age	The age of the link state advertisement in seconds.

Show Commands

Label	Description (Continued)
Sequence	The signed 32-bit integer sequence number.
Cksum	The 32-bit unsigned sum of the link-state advertisements' LS check-sums.

Sample Output

```
*A:Dut-C# show router ospf opaque-database
```

```
=====
Rtr Base OSPFv2 Instance 0 Opaque Link State Database (Type : All)
=====
```

Type	Id	Link State Id	Adv Rtr Id	Age	Sequence	Cksum
Area	0.0.0.0	4.0.0.0	10.20.1.2	740	0x80000002	0x5653
Area	0.0.0.0	7.0.0.2	10.20.1.2	745	0x80000001	0xee35
Area	0.0.0.0	7.16.0.6	10.20.1.2	725	0x80000002	0xe434
Area	0.0.0.0	8.0.0.6	10.20.1.2	730	0x80000002	0x5f1d
Area	0.0.0.0	8.0.0.7	10.20.1.2	731	0x80000002	0xbeb8
Area	0.0.0.0	4.0.0.0	10.20.1.3	739	0x80000002	0x6dd6
Area	0.0.0.0	7.0.0.2	10.20.1.3	744	0x80000001	0x1601
Area	0.0.0.0	7.16.0.2	10.20.1.3	734	0x80000001	0x914
Area	0.0.0.0	8.0.0.6	10.20.1.3	728	0x80000002	0x8ac1
Area	0.0.0.0	8.0.0.7	10.20.1.3	729	0x80000002	0xf57b
Area	0.0.0.0	4.0.0.0	10.20.1.4	740	0x80000002	0x15ba
Area	0.0.0.0	7.0.0.2	10.20.1.4	745	0x80000001	0x3dcc
Area	0.0.0.0	7.16.0.3	10.20.1.4	736	0x80000001	0xda04
Area	0.0.0.0	8.0.0.4	10.20.1.4	732	0x80000002	0xfe4a
Area	0.0.0.0	8.0.0.5	10.20.1.4	732	0x80000002	0x4f1f
Area	0.0.0.0	4.0.0.0	10.20.1.5	738	0x80000002	0x746e
Area	0.0.0.0	7.0.0.2	10.20.1.5	744	0x80000001	0x6498
Area	0.0.0.0	7.16.0.6	10.20.1.5	730	0x80000001	0xb624
Area	0.0.0.0	8.0.0.4	10.20.1.5	729	0x80000002	0x50f1
Area	0.0.0.0	8.0.0.5	10.20.1.5	730	0x80000002	0xc279
Area	0.0.0.1	4.0.0.0	10.20.1.1	740	0x80000002	0xf5a0
Area	0.0.0.1	7.0.0.2	10.20.1.1	745	0x80000001	0xc769
Area	0.0.0.1	8.0.0.4	10.20.1.1	730	0x80000002	0x3f46
Area	0.0.0.1	8.0.0.5	10.20.1.1	731	0x80000002	0x7e02
Area	0.0.0.1	4.0.0.0	10.20.1.2	739	0x80000002	0x5653
Area	0.0.0.1	7.16.0.1	10.20.1.2	744	0x80000001	0x46cc
Area	0.0.0.1	7.16.0.2	10.20.1.2	735	0x80000001	0x9663
Area	0.0.0.1	7.16.0.3	10.20.1.2	734	0x80000001	0xe6f9
Area	0.0.0.1	7.16.0.4	10.20.1.2	725	0x80000002	0xad3d
Area	0.0.0.1	7.16.0.5	10.20.1.2	725	0x80000002	0x49b8
Area	0.0.0.1	8.0.0.4	10.20.1.2	730	0x80000002	0x3324
Area	0.0.0.1	8.0.0.5	10.20.1.2	731	0x80000002	0x89f3
Area	0.0.0.1	4.0.0.0	10.20.1.3	739	0x80000002	0x6dd6
Area	0.0.0.1	7.16.0.1	10.20.1.3	743	0x80000001	0x6d98
Area	0.0.0.1	7.16.0.3	10.20.1.3	723	0x80000002	0xdef f
Area	0.0.0.1	7.16.0.4	10.20.1.3	729	0x80000001	0xa941
Area	0.0.0.1	7.16.0.5	10.20.1.3	724	0x80000002	0x7084
Area	0.0.0.1	7.16.0.6	10.20.1.3	724	0x80000002	0xcff
Area	0.0.0.1	8.0.0.4	10.20.1.3	730	0x80000002	0xada2
Area	0.0.0.1	8.0.0.5	10.20.1.3	730	0x80000002	0x9bb2

```
-----
```

No. of Opaque LSAs: 40

A:ALA-A# **show router ospf 1 opaque-database**

Rtr Base OSPFv2 Instance 1 Opaque Link State Database (type : All)

Area Id	Type	Link State Id	Adv Rtr Id	Age	Sequence	Cksum
0.0.0.0	Area	1.0.0.1	180.0.0.2	205	0x8000007e	0xb1b2
0.0.0.0	Area	1.0.0.1	180.0.0.5	617	0x80000084	0xb1a6
0.0.0.0	Area	1.0.0.1	180.0.0.8	1635	0x80000081	0xc391
0.0.0.0	Area	1.0.0.1	180.0.0.9	1306	0x80000082	0xc58c
0.0.0.0	Area	1.0.0.1	180.0.0.10	53	0x80000082	0xc986
0.0.0.0	Area	1.0.0.1	180.0.0.11	577	0x8000007e	0xd57c
0.0.0.0	Area	1.0.0.1	180.0.0.12	1628	0x80000080	0xd578
0.0.0.0	Area	1.0.0.1	180.0.0.13	581	0x80000080	0xd972
0.0.0.0	Area	1.0.0.1	180.0.0.22	1006	0x80000080	0xfd3c
0.0.0.0	Area	1.0.0.1	180.0.0.23	1238	0x80000083	0xfb39
0.0.0.0	Area	1.0.0.1	180.0.0.27	55	0x80000083	0xc21
0.0.0.0	Area	1.0.0.1	180.0.0.28	389	0x80000083	0x101b
0.0.0.0	Area	1.0.0.1	180.0.0.29	1658	0x80000082	0x1614
0.0.0.0	Area	1.0.0.1	180.0.0.30	976	0x80000083	0x180f
0.0.0.0	Area	1.0.0.2	180.0.0.2	45	0x800000a0	0x2f60
0.0.0.0	Area	1.0.0.2	180.0.0.5	1357	0x80000084	0x7038
0.0.0.0	Area	1.0.0.2	180.0.0.8	1960	0x80000084	0x3472
...						

No. of Opaque LSAs: 88

A:ALA-A#

*A:Dut-C# **show router ospf opaque-database adv-router 10.20.1.5**

Rtr Base OSPFv2 Instance 0 Opaque Link State Database (Type : All)

Type	Id	Link State Id	Adv Rtr Id	Age	Sequence	Cksum
Area	0.0.0.0	4.0.0.0	10.20.1.5	750	0x80000002	0x746e
Area	0.0.0.0	7.0.0.2	10.20.1.5	756	0x80000001	0x6498
Area	0.0.0.0	7.16.0.6	10.20.1.5	742	0x80000001	0xb624
Area	0.0.0.0	8.0.0.4	10.20.1.5	741	0x80000002	0x50f1
Area	0.0.0.0	8.0.0.5	10.20.1.5	742	0x80000002	0xc279

No. of Opaque LSAs: 5

*A:Dut-C# **show router ospf opaque-database adv-router 10.20.1.5 detail**

Rtr Base OSPFv2 Instance 0 Opaque Link State Database (Type : All) (Detailed)

Opaque LSA

Area Id	: 0.0.0.0	Adv Router Id	: 10.20.1.5
Link State Id	: 4.0.0.0	LSA Type	: Area Opaque

Show Commands

```
Sequence No      : 0x80000002          Checksum        : 0x746e
Age              : 752                  Length          : 52
Options         : E
Advertisement    : Router Info
  Capabilities (1) Len 4 :
    0x14
  SR algorithm (8) Len 1 :
    0x0
  SR label range (9) Len 12 :
    Range-size=1001
  Sub-TLV SID/label(1) len 3 :
    label=25000
```

Opaque LSA

```
Area Id         : 0.0.0.0              Adv Router Id   : 10.20.1.5
Link State Id   : 7.0.0.2              LSA Type       : Area Opaque
Sequence No     : 0x80000001          Checksum        : 0x6498
Age             : 758                  Length          : 44
Options        : E
Advertisement    : Extended Prefix
  TLV Extended prefix (1) Len 20 :
    rtType=1 pfxLen=32 AF=0 pfx=10.20.1.5
    Flags=Node (0x40)
  Sub-TLV Prefix SID (2) len 8 :
    Flags=noPHP (0x40)
    MT-ID=0 Algorithm=0 SID/Index/Label=55
```

Opaque LSA

```
Area Id         : 0.0.0.0              Adv Router Id   : 10.20.1.5
Link State Id   : 7.16.0.6             LSA Type       : Area Opaque
Sequence No     : 0x80000001          Checksum        : 0xb624
Age             : 744                  Length          : 44
Options        : E
Advertisement    : Extended Prefix
  TLV Extended prefix (1) Len 20 :
    rtType=3 pfxLen=32 AF=0 pfx=10.20.1.6
    Flags=Node (0x40)
  Sub-TLV Prefix SID (2) len 8 :
    Flags=noPHP (0x40)
    MT-ID=0 Algorithm=0 SID/Index/Label=66
```

Opaque LSA

```
Area Id         : 0.0.0.0              Adv Router Id   : 10.20.1.5
Link State Id   : 8.0.0.4              LSA Type       : Area Opaque
Sequence No     : 0x80000002          Checksum        : 0x50f1
Age             : 743                  Length          : 52
Options        : E
Advertisement    : Extended Link
  TLV Extended link (1) Len 28 :
    link Type=Transit (2) Id=1.3.5.5 Data=1.3.5.5
  Sub-TLV LAN-Adj-SID (3) len 11 :
    Flags=Value Local (0x60)
    MT-ID=0 Weight=0 Neighbor-ID=10.20.1.3
    SID/Index/Label=262139
```

Opaque LSA

```

-----
Area Id       : 0.0.0.0           Adv Router Id  : 10.20.1.5
Link State Id : 8.0.0.5           LSA Type       : Area Opaque
Sequence No   : 0x80000002       Checksum       : 0xc279
Age           : 744               Length         : 52
Options       : E
Advertisement  : Extended Link
                TLV Extended link (1) Len 28 :
                  link Type=Transit (2) Id=1.4.5.5 Data=1.4.5.5
                  Sub-TLV LAN-Adj-SID (3) len
=====

```

```
*A:Dut-A# show router ospf 1 opaque-database adv-router 10.20.1.1 detail
```

```

=====
Rtr Base OSPFv2 Instance 1 Opaque Link State Database (type : All) (detail)
=====

```

```
Opaque LSA
```

```

-----
Area Id       : 0.0.0.0           Adv Router Id  : 10.20.1.1
Link State Id : 1.0.0.1           LSA Type       : Area Opaque
Sequence No   : 0x80000028       Checksum       : 0xb136
Age           : 192               Length         : 28
Options       : E
Advertisement  :
                ROUTER-ID TLV (0001) Len 4 : 10.20.1.1
-----

```

```
Opaque LSA
```

```

-----
Area Id       : 0.0.0.0           Adv Router Id  : 10.20.1.1
Link State Id : 1.0.0.2           LSA Type       : Area Opaque
Sequence No   : 0x8000000d       Checksum       : 0x17f3
Age           : 678               Length         : 164
Options       : E
Advertisement  :
                LINK INFO TLV (0002) Len 140 :
                  Sub-TLV: 1   Len: 1   LINK_TYPE   : 2
                  Sub-TLV: 2   Len: 4   LINK_ID      : 10.10.1.2
                  Sub-TLV: 3   Len: 4   LOC_IP_ADDR  : 10.10.1.1
                  Sub-TLV: 4   Len: 4   REM_IP_ADDR  : 0.0.0.0
                  Sub-TLV: 5   Len: 4   TE_METRIC   : 1000
                  Sub-TLV: 6   Len: 4   MAX_BDWTH   : 100000 Kbps
                  Sub-TLV: 7   Len: 4   RSRVBL_BDWTH : 800000 Kbps
                  Sub-TLV: 8   Len: 32  UNRSRVD_CLS0 :
                    P0: 80000 Kbps P1: 320000 Kbps P2: 320000 Kbps P3: 320000 Kbps
                    P4: 400000 Kbps P5: 400000 Kbps P6: 400000 Kbps P7: 80000 Kbps
                  Sub-TLV: 9   Len: 4   ADMIN_GROUP  : 0 None
                  Sub-TLV: 17  Len: 36  TELK_BW_CONST:
                    BW Model : MAM
                    BC0: 80000 Kbps BC1: 0 Kbps BC2: 320000 Kbps BC3: 0 Kbps
                    BC4: 0 Kbps BC5: 400000 Kbps BC6: 0 Kbps BC7: 0 Kbps
-----

```

```
*A:Dut-A#
```

prefix-sids

Syntax `prefix-sids [ip-prefix[/prefix-length]] [sid sid] [adv-router router-id]`

Context `show>router>ospf`

Description This command displays OSPF prefix SIDs.

Parameters
ip-prefix[/prefix-length] — Displays information about the specified IP prefix and length.
sid — Displays information for the specific segment identifier from 0 - 524287.
router-id — Displays information for the specific advertising router identified by its router-id.

Sample Output

```
*A:Dut-C# show router ospf prefix-sids

=====
Rtr Base OSPFv2 Instance 0 Prefix-Sids
=====
Prefix                Area          RtType      SID
                    Adv-Rtr      Active      Flags
-----
10.20.1.1/32          0.0.0.0      INTER-AREA  11
                    10.20.1.2      N          NnP
10.20.1.1/32          0.0.0.1      INTRA-AREA  11
                    10.20.1.1      Y          NnP
10.20.1.2/32          0.0.0.0      INTRA-AREA  22
                    10.20.1.2      Y          NnP
10.20.1.2/32          0.0.0.1      INTER-AREA  22
                    10.20.1.2      N          NnP
10.20.1.3/32          0.0.0.0      INTRA-AREA  33
                    10.20.1.3      Y          NnP
10.20.1.3/32          0.0.0.1      INTER-AREA  33
                    10.20.1.2      N          NnP
10.20.1.4/32          0.0.0.0      INTRA-AREA  44
                    10.20.1.4      Y          NnP
10.20.1.4/32          0.0.0.1      INTER-AREA  44
                    10.20.1.2      N          NnP
10.20.1.5/32          0.0.0.0      INTRA-AREA  55
                    10.20.1.5      Y          NnP
10.20.1.5/32          0.0.0.1      INTER-AREA  55
                    10.20.1.2      N          NnP
10.20.1.6/32          0.0.0.0      INTER-AREA  66
                    10.20.1.4      N          NnP
10.20.1.6/32          0.0.0.0      INTER-AREA  66
                    10.20.1.5      Y          NnP
10.20.1.6/32          0.0.0.1      INTER-AREA  66
                    10.20.1.2      N          NnP
-----
No. of Prefix/SIDs: 13
Flags:  N = Node-SID
        nP = no penultimate hop POP
        M = Mapping server
        E = Explicit-Null
        V = Prefix-SID carries a value
```

```

        L = value/index has local significance
        I = Inter Area flag
        A = Attached flag
=====
*A:Dut-C# show router ospf prefix-sids sid 66

=====
Rtr Base OSPFv2 Instance 0 Prefix-Sids
=====
Prefix                               Area          RtType      SID
                                     Adv-Rtr      Active      Flags
-----
10.20.1.6/32                          0.0.0.0      INTER-AREA  66
                                     10.20.1.4      N          NnP
10.20.1.6/32                          0.0.0.0      INTER-AREA  66
                                     10.20.1.5      Y          NnP
10.20.1.6/32                          0.0.0.1      INTER-AREA  66
                                     10.20.1.2      N          NnP
-----
No. of Prefix/SIDs: 3
Flags:  N = Node-SID
        nP = no penultimate hop POP
        M = Mapping server
        E = Explicit-Null
        V = Prefix-SID carries a value
        L = value/index has local significance
        I = Inter Area flag
        A = Attached flag
=====
*A:Dut-C#

```

range

Syntax `range [area-id]`

Context `show>router>ospf`
`show>router>ospf3`

Description This command displays ranges of addresses on an Area Border Router (ABR) for the purpose of route summarization or suppression.

Parameters *area-id* — Display the configured ranges for the specified area.

Output **OSPF Range Output** — The following table describes the OSPF range output fields.

Label	Description
Area Id	A 32-bit integer uniquely identifying an area. Area ID 0.0.0.0 is used for the OSPF backbone.
Address/Mask	The mask for the range expressed as a decimal integer mask length or in dotted decimal notation.

Show Commands

Label	Description (Continued)
Advertise	False — The specified address/mask is not advertised outside the area. True — The specified address/mask is advertised outside the area.
LSDb Type	NSSA — This range was specified in the NSSA context, and specifies that the range applies to external routes (via type-7 LSAs) learned within the NSSA when the routes are advertised to other areas as type-5 LSAs. Summary — This range was not specified in the NSSA context, the range applies to summary LSAs even if the area is an NSSA.

Sample Output

```
A:ALA-A# show router ospf 1 range
=====
Rtr Base OSPFv2 Instance 1 Ranges
=====
Area Id          Address/Mask      Advertise  LSDb Type
-----
No. of Ranges: 0
=====
A:ALA-A#

A:ALA-A# show router ospf range 180.0.7.9
=====
Rtr Base OSPFv2 Instance 0 Ranges for Area-Id 180.0.7.9
=====
Area Id          Address/Mask      Advertise  LSDb Type
-----
No. of Ranges: 0
=====
A:ALA-A#
```

routes

Syntax `routes [ip-prefix[/prefix-length]] [type] [detail] [alternative] [summary] [exclude-shortcut]`

Context `show>router>ospf`

Description This command displays information about OSPF routes.

Parameters `ip-prefix[/prefix-length]` — Displays information about the specified IP prefix and length.

`type` — Displays information about the specified type.

Values `intra-area, inter-area, external-1, external-2, nssa-1, nssa-2`

`detail` — Displays detailed information about the routes.

alternative — Displays the level of protection per prefix (ref. show router isis routes alternative)

summary — Displays summarized information about the routes.

exclude-shortcut — Displays routes without shortcut.

Sample Output

```
*A:Dut-C# show router ospf routes
```

```
=====
Rtr Base OSPFv2 Instance 0 Routing Table
=====
Destination          Type (Dest)  Stat  SID  SIDflgs
  NHIF              NHIF      Cost[E2]
-----
1.1.1.1/32           IA (HOST)    N (R)
  1.1.3.1             3           1000
1.1.2.0/24           IA (NET)     N (R)
  1.1.3.1             3           2000
  1.2.3.2             4           2000
1.1.3.0/24           IA (NET)     D (F)
  DIRECT              3           1000
1.2.3.0/24           IA (NET)     D (F)
  DIRECT              4           1000
1.2.4.0/24           IA (NET)     N (R)
  2.2.3.2             5           2000
1.3.5.0/24           IA (NET)     D (F)
  DIRECT              6           1000
1.4.5.0/24           IA (NET)     N (R)
  1.3.5.5             6           2000
1.4.6.0/24           IE (NET)     N (R)
  2.2.3.2             5           3000
  1.3.5.5             6           3000
1.5.6.0/24           IE (NET)     N (R)
  1.3.5.5             6           2000
2.2.2.2/32           IA (HOST)    N (R)
  2.2.3.2             5           1000
2.2.3.0/24           IA (NET)     D (F)
  DIRECT              5           1000
3.3.3.3/32           IA (HOST)    D (F)
  DIRECT              2           0
4.4.4.4/32           IA (HOST)    N (R)
  2.2.3.2             5           2000
  1.3.5.5             6           2000
5.5.5.5/32           IA (HOST)    N (R)
  1.3.5.5             6           1000
6.6.6.6/32           IE (HOST)    N (R)
  1.3.5.5             6           2000
10.20.1.1/32         IA (HOST)    N (R)  11    NnP
  1.1.3.1             3           1000
10.20.1.2/32         IA (HOST)    N (R)  22    NnP
  2.2.3.2             5           1000
10.20.1.3/32         IA (HOST)    D (F)  33    NnP
  DIRECT              1           0
10.20.1.4/32         IA (HOST)    N (R)  44    NnP
  2.2.3.2             5           2000
  1.3.5.5             6           2000
```

Show Commands

```

10.20.1.5/32      IA (HOST)      N (R)  55      NnP
  1.3.5.5        6             1000
10.20.1.6/32      IE (HOST)      N (R)  66      NnP
  1.3.5.5        6             2000

10.20.1.1/0       IA (RTR)       N (N)
  1.1.3.1        3             1000
10.20.1.2/0       IA (AB-AS)     N (N)
  2.2.3.2        5             1000
10.20.1.2/0       IA (AB-AS)     N (N)
  1.2.3.2        4             1000
10.20.1.4/0       IA (AB-AS)     N (N)
  2.2.3.2        5             2000
  1.3.5.5        6             2000
10.20.1.5/0       IA (AB-AS)     N (N)
  1.3.5.5        6             1000

```

```

-----
No. of routes found: 26 (31 paths)
Stat: D = direct   N = not direct
(RTM stat):(R) = added      (F) = add failed
      (N) = not added  (D) = policy discarded
SID Flags : N = Node-SID
            nP = no penultimate hop POP
            M = Mapping server
            E = Explicit-Null
            V = Prefix-SID carries a value
            L = value/index has local significance
            I = Inter Area flag
            A = Attached flag
=====

```

*A:Dut-C# **show router ospf routes**

```

=====
Rtr Base OSPFv2 Instance 0 Routing Table
=====

```

Destination NHIF	Type(Dest) NHIF	Stat Cost[E2]	SID	SIDflgs

1.1.1.1/32	IA (HOST)	N (R)		
1.1.3.1	3	1000		
1.1.2.0/24	IA (NET)	N (R)		
1.1.3.1	3	2000		
1.2.3.2	4	2000		
1.1.3.0/24	IA (NET)	D (F)		
DIRECT	3	1000		
1.2.3.0/24	IA (NET)	D (F)		
DIRECT	4	1000		
1.2.4.0/24	IA (NET)	N (R)		
2.2.3.2	5	2000		
1.3.5.0/24	IA (NET)	D (F)		
DIRECT	6	1000		
1.4.5.0/24	IA (NET)	N (R)		
1.3.5.5	6	2000		
1.4.6.0/24	IE (NET)	N (R)		
2.2.3.2	5	3000		
1.3.5.5	6	3000		
1.5.6.0/24	IE (NET)	N (R)		

```

1.3.5.5          6          2000
2.2.2.2/32      IA (HOST)   N (R)
2.2.3.2          5          1000
2.2.3.0/24      IA (NET)    D (F)
DIRECT          5          1000
3.3.3.3/32      IA (HOST)   D (F)
DIRECT          2          0
4.4.4.4/32      IA (HOST)   N (R)
2.2.3.2          5          2000
1.3.5.5          6          2000
5.5.5.5/32      IA (HOST)   N (R)
1.3.5.5          6          1000
6.6.6.6/32      IE (HOST)   N (R)
1.3.5.5          6          2000
10.20.1.1/32    IA (HOST)   N (R)  11    NnP
1.1.3.1          3          1000
10.20.1.2/32    IA (HOST)   N (R)  22    NnP
2.2.3.2          5          1000
10.20.1.3/32    IA (HOST)   D (F)  33    NnP
DIRECT          1          0
10.20.1.4/32    IA (HOST)   N (R)  44    NnP
2.2.3.2          5          2000
1.3.5.5          6          2000
10.20.1.5/32    IA (HOST)   N (R)  55    NnP
1.3.5.5          6          1000
10.20.1.6/32    IE (HOST)   N (R)  66    NnP
1.3.5.5          6          2000

10.20.1.1/0     IA (RTR)    N (N)
1.1.3.1          3          1000
10.20.1.2/0     IA (AB-AS)  N (N)
2.2.3.2          5          1000
10.20.1.2/0     IA (AB-AS)  N (N)
1.2.3.2          4          1000
10.20.1.4/0     IA (AB-AS)  N (N)
2.2.3.2          5          2000
1.3.5.5          6          2000
10.20.1.5/0     IA (AB-AS)  N (N)
1.3.5.5          6          1000

```

```
-----
No. of routes found: 26 (31 paths)
```

```
Stat: D = direct  N = not direct
```

```
(RTM stat):(R) = added      (F) = add failed
```

```
(N) = not added  (D) = policy discarded
```

```
SID Flags : N = Node-SID
```

```
nP = no penultimate hop POP
```

```
M = Mapping server
```

```
E = Explicit-Null
```

```
V = Prefix-SID carries a value
```

```
L = value/index has local significance
```

```
I = Inter Area flag
```

```
A = Attached flag
```

```
-----
*A:Dut-C# show router ospf routes alternative
-----
```

```
Rtr Base OSPFv2 Instance 0 Routing Table
```

Show Commands

```

=====
Destination          Type (Dest)   Stat   SID   SIDflgs
  NHIP              NHIF         Cost[E2]
  A-NHIP (L)       A-NHIF      A-Cost[E2]
-----
1.1.1.1/32          IA (HOST)    N (R)
  1.1.3.1           3            1000
  1.2.3.2(L)       4            2000
1.1.2.0/24         IA (NET)    N (R)
  1.1.3.1           3            2000
  1.2.3.2           4            2000
1.1.3.0/24         IA (NET)    D (F)
  DIRECT           3            1000
1.2.3.0/24         IA (NET)    D (F)
  DIRECT           4            1000
1.2.4.0/24         IA (NET)    N (R)
  2.2.3.2           5            2000
1.3.5.0/24         IA (NET)    D (F)
  DIRECT           6            1000
1.4.5.0/24         IA (NET)    N (R)
  1.3.5.5           6            2000
1.4.6.0/24         IE (NET)    N (R)
  2.2.3.2           5            3000
  1.3.5.5           6            3000
1.5.6.0/24         IE (NET)    N (R)
  1.3.5.5           6            2000
2.2.2.2/32         IA (HOST)    N (R)
  2.2.3.2           5            1000
2.2.3.0/24         IA (NET)    D (F)
  DIRECT           5            1000
3.3.3.3/32         IA (HOST)    D (F)
  DIRECT           2            0
4.4.4.4/32         IA (HOST)    N (R)
  2.2.3.2           5            2000
  1.3.5.5           6            2000
5.5.5.5/32         IA (HOST)    N (R)
  1.3.5.5           6            1000
6.6.6.6/32         IE (HOST)    N (R)
  1.3.5.5           6            2000
10.20.1.1/32       IA (HOST)    N (R)  11    NnP
  1.1.3.1           3            1000
  1.2.3.2(L)       4            2000
10.20.1.2/32       IA (HOST)    N (R)  22    NnP
  2.2.3.2           5            1000
10.20.1.3/32       IA (HOST)    D (F)  33    NnP
  DIRECT           1            0
10.20.1.4/32       IA (HOST)    N (R)  44    NnP
  2.2.3.2           5            2000
  1.3.5.5           6            2000
10.20.1.5/32       IA (HOST)    N (R)  55    NnP
  1.3.5.5           6            1000
10.20.1.6/32       IE (HOST)    N (R)  66    NnP
  1.3.5.5           6            2000

10.20.1.1/0        IA (RTR)    N (N)
  1.1.3.1           3            1000
10.20.1.2/0        IA (AB-AS)  N (N)
  2.2.3.2           5            1000
10.20.1.2/0        IA (AB-AS)  N (N)

```



```

1.2.3.2          4          1000
10.20.1.4/0     IA (AB-AS)  N (N)
2.2.3.2          5          2000
1.3.5.5          6          2000
10.20.1.5/0     IA (AB-AS)  N (N)
1.3.5.5          6          1000

```

```

-----
No. of routes found: 26 (31 paths)
Flags: L = Loop-Free Alternate nexthop
Stat: D = direct   N = not direct
(RTM stat):(R) = added      (F) = add failed
          (N) = not added  (D) = policy discarded
SID Flags : N = Node-SID
          nP = no penultimate hop POP
          M = Mapping server
          E = Explicit-Null
          V = Prefix-SID carries a value
          L = value/index has local significance
          I = Inter Area flag
          A = Attached flag
=====

```

*A:Dut-C# show router ospf routes alternative detail

```

=====
Rtr Base OSPFv2 Instance 0 Routing Table (detail)
=====

```

Destination	Type (Dest)	Stat	SID	SIDflgs	Type	Weight:Cfg/Norm
NHIF	NHIF	Cost[E2]	Area		PGID	
A-NHIF(L)	A-NHIF	A-Cost[E2]	A-Type			
1.1.1.1/32	IA (HOST)	N (R)				
1.1.3.1	3	1000	0.0.0.1			
1.2.3.2(L)	4	2000	LINK		0x410079	
1.1.2.0/24	IA (NET)	N (R)				
1.1.3.1	3	2000	0.0.0.1			
1.2.3.2	4	2000	0.0.0.1			
1.1.3.0/24	IA (NET)	D (F)				
DIRECT	3	1000	0.0.0.1			
1.2.3.0/24	IA (NET)	D (F)				
DIRECT	4	1000	0.0.0.1			
1.2.4.0/24	IA (NET)	N (R)				
2.2.3.2	5					

*A:Dut-C# show router ospf 1 routes exclude-shortcut alternative detail

```

=====
Rtr Base OSPFv2 Instance 1 Routing Table excluding shortcuts (detail)
=====

```

Destination	Type (Dest)	Stat	Area	Tunnel-Information
NHIF	NHIF	Cost[E2]	Area	PGID
A-NHIF(L)	A-NHIF	A-Cost[E2]	A-Type	PGID
1.1.2.0/24	IA (NET)	N (R)		
1.1.3.1	3	20	0.0.0.0	
1.2.3.2	4	20	0.0.0.0	
1.1.3.0/24	IA (NET)	D (F)		

Show Commands

```

    DIRECT          3          10      0.0.0.0
1.2.3.0/24        IA (NET)      D (F)
    DIRECT          4          10      0.0.0.0
1.2.4.0/24        IA (NET)      N (R)
    1.2.3.2         4          20      0.0.0.0
1.3.5.0/24        IA (NET)      D (F)
    DIRECT          5          10      0.0.0.0
1.4.5.0/24        IA (NET)      N (R)
    1.3.5.5         5          20      0.0.0.0
1.4.6.0/24        IA (NET)      N (R)
    1.2.3.2         4          30      0.0.0.0
    1.3.5.5         5          30      0.0.0.0
10.20.1.1/32      IA (HOST)     N (R)
    1.1.3.1         3          10      0.0.0.0
10.20.1.2/32      IA (HOST)     N (R)
    1.2.3.2         4          10      0.0.0.0
10.20.1.3/32      IA (HOST)     D (F)
    DIRECT          1          0       0.0.0.0
10.20.1.4/32      IA (HOST)     N (R)
    1.2.3.2         4          20      0.0.0.0
    1.3.5.5         5          20      0.0.0.0
10.20.1.5/32      IA (HOST)     N (R)
    1.3.5.5         5          10      0.0.0.0
10.20.1.6/32      IA (HOST)     N (R)
    1.2.3.2         4          30      0.0.0.0
    1.3.5.5         5          30      0.0.0.0

10.20.1.1/0       IA (RTR)      N (N)
    1.1.3.1         3          10      0.0.0.0
10.20.1.2/0       IA (RTR)      N (N)
    1.2.3.2         4          10      0.0.0.0
10.20.1.4/0       IA (RTR)      N (N)
    1.2.3.2         4          20      0.0.0.0
    1.3.5.5         5          20      0.0.0.0
10.20.1.5/0       IA (RTR)      N (N)
    1.3.5.5         5          10      0.0.0.0
10.20.1.6/0       IA (RTR)      N (N)
    1.2.3.2         4          30      0.0.0.0
    1.3.5.5         5          30      0.0.0.0

```

 No. of routes found: 18 (24 paths)

Flags: L = Loop-Free Alternate nexthop

Stat: D = direct N = not direct

(RTM stat):(R) = added (F) = add failed

(N) = not added (D) = policy discarded

=====

```
*A:Dut-C#
```

```
*A:Dut-A# show router ospf routes alternative detail
```

=====

```
Rtr Base OSPFv2 Instance 0 Routing Table (detail)
```

=====

Destination	Type (Dest)	Stat		
NHIF	NHIF	Cost[E2]	Area	Tunnel-Information
A-NHIF(L)	A-NHIF	A-Cost[E2]	A-Type	PGID

1.1.2.0/24	IA (NET)	D (F)		

```

DIRECT                2          10      0.0.0.0
1.1.3.0/24           IA (NET)      D (F)
DIRECT                3          10      0.0.0.0
1.2.3.0/24           IA (NET)      N (R)
  1.1.2.2             2          20      0.0.0.0
  1.1.3.3             3          20      0.0.0.0
1.2.4.0/24           IA (NET)      N (R)
  1.1.2.2             2          20      0.0.0.0
  1.1.3.3(L)         3          30      LINK          0x130015
1.3.5.0/24           IA (NET)      N (R)
  1.1.3.3             3          20      0.0.0.0
  1.1.2.2(L)         2          30      LINK          0x130016
1.4.5.0/24           IA (NET)      N (R)
  1.1.2.2             2          30      0.0.0.0
  1.1.3.3             3          30      0.0.0.0
1.4.6.0/24           IA (NET)      N (R)
  1.1.2.2             2          30      0.0.0.0
  1.1.3.3(L)         3          40      LINK          0x130015
1.5.6.0/24           IA (NET)      N (R)
  1.1.3.3             3          30      0.0.0.0
  1.1.2.2(L)         2          40      LINK          0x130016
10.20.1.1/32         IA (HOST)     D (F)
DIRECT                1          0       0.0.0.0
10.20.1.2/32         IA (HOST)     N (R)
  1.1.2.2             2          10      0.0.0.0
  1.1.3.3(L)         3          20      LINK          0x130015
10.20.1.3/32         IA (HOST)     N (R)
  1.1.3.3             3          10      0.0.0.0
  1.1.2.2(L)         2          20      LINK          0x130016
10.20.1.4/32         IA (HOST)     N (R)
  1.1.2.2             2          20      0.0.0.0
  1.1.3.3(L)         3          30      LINK          0x130015
10.20.1.5/32         IA (HOST)     N (R)
  1.1.3.3             3          20      0.0.0.0
  1.1.2.2(L)         2          30      LINK          0x130016
10.20.1.3/0          IA (RTR)      N (N)
  1.1.3.3             3          10      0.0.0.0
10.20.1.4/0          IA (RTR)      N (N)
  1.1.2.2             2          20      0.0.0.0
10.20.1.5/0          IA (RTR)      N (N)
  1.1.3.3             3          20      0.0.0.0
10.20.1.6/0          IA (RTR)      N (N)
  1.1.3.3             3          30      0.0.0.0
  1.1.2.2             2          30      0.0.0.0

```

19 OSPFv2 routes found (23 paths)

Flags: L = Loop-Free Alternate nexthop

=====

*A:Dut-C# show router ospf 1 routes 10.0.0.2/32 detail

=====

Rtr Base OSPFv2 Instance 1 Routing Table (detail)

```

-----
Destination          Type (Dest)   Stat
NHIP                 NHIF          Cost[E2]      Area          Type          Weight:Cfg/Norm
-----
10.0.0.2/32          E2 (HOST)    N (R)
  1.0.0.3             RSVP:94      9:10          0.0.0.0      Shortcut      40/20

```

Show Commands

```
1.0.0.3          RSVP:61442      9:10  0.0.0.0          Shortcut          2/ 1
```

```
-----  
No. of routes found: 1 (2 paths)  
Stat: D = direct  N = not direct  
(RTM stat):(R) = added      (F) = add failed  
          (N) = not added  (D) = policy discarded  
=====
```

spf

Syntax `spf [lfa]`

Context `show>router>ospf`
`show>router>ospf3`

Description This command displays statistics of shortest-path-first (SPF) calculations.

Parameters `lfa` — Displays Loop-Free Alternate (LFA) next-hop information.

Output **SPF Output Fields** — The following table describes SPF output fields.

Label	Description
Total SPF Runs	The total number of incremental SPF runs triggered by new or updated LSAs.
Last Full SPF run @	The date and time when the external OSPF Dijkstra (SPF) was last run.
Last Full SPF Time	The length of time, in seconds, when the last full SPF was run.
Intra SPF Time	The time when intra-area SPF was last run on this area.
Inter SPF Time	The total number of incremental SPF runs triggered by new or updated type-3 and type-4 summary LSAs.
Extern SPF Time	The total number of incremental SPF runs triggered by new or updated type-5 external LSAs.
RTM Updt Time	The time, in hundredths of seconds, used to perform a total SPF calculation.
Min/Avg/Max Full SPF Time	Min — The minimum time, in hundredths of seconds, used to perform a total SPF calculation. Avg — The average time, in hundredths of seconds, of all the total SPF calculations performed by this OSPF router. Max — The maximum time, in hundredths of seconds, used to perform a total SPF calculation.
Total Sum Incr SPF Runs	The total number of incremental SPF runs triggered by new or updated type-3 and type-4 summary LSAs.
Total Ext Incr SPF Runs	The total number of incremental SPF runs triggered by new or updated type-5 external LSAs.

Sample Output

```
*A:Dut-C# show router ospf spf
```

```
=====
Rtr Base OSPFv2 Instance 0 SPF Statistics
=====
```

```
Total SPF Runs           : 6
```

Show Commands

```
Last Full SPF run @      : 05/27/2015 08:45:25
Last Full SPF Time      : < 0.01 secs
  Intra SPF Time        : < 0.01 secs
  Inter SPF Time        : < 0.01 secs
  Extern SPF Time       : < 0.01 secs
  RTM Updt Time         : < 0.01 secs

Min/Avg/Max Full SPF Times : 0.00/0.00/0.00 secs
Min/Avg/Max RTM Updt Times : 0.00/0.00/0.00 secs

Total Sum Incr SPF Runs : 9
Last Sum Incr SPF run @ : 05/27/2015 08:36:14
Last Sum Incr Calc Time : < 0.01 secs

Total Ext Incr SPF Runs : 0
```

```
=====  
*A:Dut-C# show router ospf spf lfa
```

```
=====  
Rtr Base OSPFv2 Instance 0 SPF Statistics  
=====
```

```
Total SPF Runs      : 6
Last Full SPF run @  : 05/27/2015 08:45:25
Last Full SPF Time   : < 0.01 secs
  Intra SPF Time     : < 0.01 secs
  Inter SPF Time     : < 0.01 secs
  Extern SPF Time    : < 0.01 secs
  RTM Updt Time      : < 0.01 secs

Min/Avg/Max Full SPF Times : 0.00/0.00/0.00 secs
Min/Avg/Max RTM Updt Times : 0.00/0.00/0.00 secs

Total Sum Incr SPF Runs : 9
Last Sum Incr SPF run @ : 05/27/2015 08:36:14
Last Sum Incr Calc Time : < 0.01 secs

Total Ext Incr SPF Runs : 0
```

```
Total LFA SPF Runs      : 1
Last LFA SPF run @      : 05/27/2015 08:45:25
Last LFA SPF Time       : < 0.01 secs
Min/Avg/Max LFA SPF Times : 0.00/0.00/0.00 secs  
=====
```

```
A:Dut-A# show router ospf 1 spf lfa
```

```
=====  
Rtr Base OSPFv2 Instance 1 SPF Statistics  
=====
```

```
Total SPF Runs      : 6
Last Full SPF run @  : 02/20/2012 09:19:35
Last Full SPF Time   : < 0.01 secs
  Intra SPF Time     : < 0.01 secs
  Inter SPF Time     : < 0.01 secs
  Extern SPF Time    : < 0.01 secs
  RTM Updt Time      : < 0.01 secs

Min/Avg/Max Full SPF Times : 0.00/0.00/0.00 secs
```

Min/Avg/Max RTM Updt Times : 0.00/0.00/0.00 secs

Total Sum Incr SPF Runs : 0

Total Ext Incr SPF Runs : 0

Total LFA SPF Runs : 5

Last LFA SPF run @ : 02/20/2012 09:19:35

Last LFA SPF Time : < 0.01 secs

Min/Avg/Max LFA SPF Times : 0.00/0.00/0.00 secs

=====
A:ALA-A# show router ospf 1 spf

=====
Rtr Base OSPFv2 Instance 1 SPF Statistics
=====

Total SPF Runs : 109

Last Full SPF run @ : 11/07/2006 18:43:07

Last Full SPF Time : < 0.01 secs

 Intra SPF Time : < 0.01 secs

 Inter SPF Time : < 0.01 secs

 Extern SPF Time : < 0.01 secs

 RTM Updt Time : < 0.01 secs

Min/Avg/Max Full SPF Times : 0.02/0.00/0.06 secs

Min/Avg/Max RTM Updt Times : 0.02/0.00/0.06 secs

Total Sum Incr SPF Runs : 333

Last Sum Incr SPF run @ : 11/07/2006 18:43:09

Last Sum Incr Calc Time : < 0.01 secs

Total Ext Incr SPF Runs : 0
=====

A:ALA-A#

Show Commands

statistics

Syntax `statistics`

Context `show>router>ospf`
`show>router>ospf3`

Description This command displays the global OSPF statistics.

Output **OSPF Statistics Output Fields** — The following table describes the command output fields for OSPF statistics.

Label	Description
Rx Packets	The total number of OSPF packets received on all OSPF enabled interfaces.
Tx Packets	The total number of OSPF packets transmitted on all OSPF enabled interfaces.
Rx Hellos	The total number of OSPF Hello packets received on all OSPF enabled interfaces.
Tx Hellos	The total number of OSPF Hello packets transmitted on all OSPF enabled interfaces.
Rx DBDs	The total number of OSPF database description packets received on all OSPF enabled interfaces.
Tx DBDs	The total number of OSPF database description packets transmitted on all OSPF enabled interfaces
Rx LSRs	The total number of OSPF Link State Requests (LSRs) received on all OSPF enabled interfaces.
Tx LSRs	The total number of OSPF Link State Requests (LSRs) transmitted on all OSPF enabled interfaces.
Rx LSUs	The total number of OSPF Link State Update (LSUs) received on all OSPF enabled interfaces.
Tx LSUs	The total number of OSPF Link State Update (LSUs) transmitted on all OSPF enabled interfaces.
Rx LS Acks	The total number of OSPF Link State Acknowledgements (LSAs) received on all OSPF enabled interfaces.
New LSAs Recvd	The total number of new OSPF Link State Advertisements received on all OSPF enabled interfaces.
New LSAs Orig	The total number of new OSPF Link State Advertisements originated on all OSPF enabled interfaces.
Ext LSAs Count	The total number of OSPF External Link State Advertisements.

Label	Description
No of Areas	The number of areas configured for this OSPF instance.
Total SPF Runs	The total number of incremental SPF runs triggered by new or updated LSAs.
Ext SPF Runs	The total number of incremental SPF runs triggered by new or updated type-5 external LSAs.
Retransmits	The total number of OSPF Retransmits transmitted on all OSPF enabled interfaces.
Discards	The total number of OSPF packets discarded on all OSPF enabled interfaces.
Bad Networks	The total number of OSPF packets received on all OSPF enabled interfaces with invalid network or mask.
Bad Virt Links	The total number of OSPF packets received on all OSPF enabled interfaces that are destined to a virtual link that does not exist.
Bad Areas	The total number of OSPF packets received on all OSPF enabled interfaces with an area mismatch
Bad Dest Addr	The total number of OSPF packets received on all OSPF enabled interfaces with the incorrect IP destination address.
Bad Auth Types	The total number of OSPF packets received on all OSPF enabled interfaces with an invalid authorization type.
Auth Failures	The total number of OSPF packets received on all OSPF enabled interfaces with an invalid authorization key.
Bad Neighbors	The total number of OSPF packets received on all OSPF enabled interfaces where the neighbor information does not match the information this router has for the neighbor.
Bad Pkt Types	The total number of OSPF packets received on all OSPF enabled interfaces with an invalid OSPF packet type.
Bad Lengths	The total number of OSPF packets received on all OSPF enabled interfaces with a total length not equal to the length given in the packet itself.
Bad Hello Int.	The total number of OSPF packets received on all OSPF enabled interfaces where the hello interval given in packet was not equal to that configured for the respective interface.
Bad Dead Int.	The total number of OSPF packets received on all OSPF enabled interfaces where the dead interval given in the packet was not equal to that configured for the respective interface.

Show Commands

Label	Description
Bad Options	The total number of OSPF packets received on all OSPF enabled interfaces with an option that does not match those configured for the respective interface or area.
Bad Versions	The total number of OSPF packets received on all OSPF enabled interfaces with bad OSPF version numbers.

Sample Output

```
*A:Dut-C# show router ospf statistics
```

```
=====
```

```
Rtr Base OSPFv2 Instance 0 Statistics
```

```
=====
```

Rx Packets	: 2394	Tx Packets	: 2418
Rx Hellos	: 2264	Tx Hellos	: 2269
Rx DBDs	: 11	Tx DBDs	: 9
Rx LSRs	: 5	Tx LSRs	: 4
Rx LSUs	: 88	Tx LSUs	: 110
Rx LS Acks	: 26	Tx LS Acks	: 26
New LSAs Recvd	: 0	New LSAs Orig	: 159
Ext LSAs Count	: 0	No of Areas	: 2
No of Interfaces	: 6	No of Neighbors	: 4
Retransmits	: 1	Discards	: 3
Bad Networks	: 0	Bad Virt Links	: 0
Bad Areas	: 0	Bad Dest Addr	: 0
Bad Auth Types	: 0	Auth Failures	: 0
Bad Neighbors	: 0	Bad Pkt Types	: 0
Bad Lengths	: 0	Bad Hello Int.	: 2
Bad Dead Int.	: 1	Bad Options	: 0
Bad Versions	: 0	Bad Checksums	: 0
SID range errors	: 0	SID errors	: 0
Failed SPF Attempts	: 0	Bad MTUs	: 0
CSPF Requests	: 0	CSPF Request Drops	: 0
CSPF Path Found	: 0	CSPF Path Not Found	: 0
Total SPF Runs	: 6	Total LFA SPF Runs	: 1
Total RLFA SPF Runs	: 0		

```
=====
```

```
A:ALA-A# show router ospf 1 statistics
```

```
=====
```

```
Rtr Base OSPFv2 Instance 1 Statistics
```

```
=====
```

Rx Packets	: 308462	Tx Packets	: 246800
Rx Hellos	: 173796	Tx Hellos	: 149062
Rx DBDs	: 67	Tx DBDs	: 48
Rx LSRs	: 21	Tx LSRs	: 19
Rx LSUs	: 105672	Tx LSUs	: 65530
Rx LS Acks	: 28906	Tx LS Acks	: 32141
New LSAs Recvd	: 38113	New LSAs Orig	: 21067
Ext LSAs Count	: 17	No of Areas	: 3
Total SPF Runs	: 327	Ext SPF Runs	: 0
Retransmits	: 46	Discards	: 0

```
Bad Networks      : 0          Bad Virt Links    : 0
Bad Areas         : 0          Bad Dest Adrs    : 0
Bad Auth Types    : 0          Auth Failures    : 0
Bad Neighbors     : 0          Bad Pkt Types    : 0
Bad Lengths       : 0          Bad Hello Int.   : 0
Bad Dead Int.     : 0          Bad Options      : 0
Bad Versions      : 0          Bad Checksums    : 0
Failed SPF Attempts: 0
CSPF Requests     : 0          CSPF Request Drops : 0
CSPF Path Found   : 0          CSPF Path Not Found: 0
```

```
=====
A:ALA-A#
```

Show Commands

status

Syntax `status`

Context `show>router>ospf`
`show>router>ospf3`

Description Displays the general status of OSPF.

Output **OSPF Status Output Fields** — The following table describes the command output fields for OSPF status.

Label	Description
OSPF Router Id	A 32-bit integer uniquely identifying the router in the Autonomous System. The SR-OS system defaults to the System IP address or if not configured the 32 least significant bits of the system MAC address.
OSPF Version	The current version number of the OSPF protocol is 2.
OSPF Admin Status	Disabled — Denotes that the OSPF process is disabled on all interfaces. Enabled — Denotes that the OSPF process is active on at least one interface.
OSPF Oper Status	Disabled — Denotes that the OSPF process is not operational on all interfaces. Enabled — Denotes that the OSPF process is operational on at least one interface.
Preference	The route preference for OSPF internal routes.
External Preference	The route preference for OSPF external routes.
Backbone Router	False — This variable indicates that this router is not configured as an OSPF back bone router. True — This variable indicates that this router is configured as an OSPF back bone router.
Area Border Router	False — This router is not an area border router. True — This router is an area border router.
AS Border Router	False — This router is not configured as an Autonomous System border router. True — This router is configured as an Autonomous System border router.
OSPF Ldp Sync Admin Status	Indicates whether the IGP-LDP synchronization feature is enabled or disabled on all interfaces participating in the OSPF routing protocol.

Sample Output

```
*A:Dut-C# show router ospf status
```

```
=====
Rtr Base OSPFv2 Instance 0 Status
=====
```

```

OSPF Cfg Router Id       : 10.20.1.3
OSPF Oper Router Id     : 10.20.1.3
OSPF Version             : 2
OSPF Admin Status       : Enabled
OSPF Oper Status        : Enabled
Graceful Restart        : Disabled
GR Helper Mode          : Disabled
Preference               : 10
External Preference     : 150
Backbone Router         : True
Area Border Router     : True
AS Border Router        : True
Opaque LSA Support      : True
Traffic Engineering Support : False
RFC 1583 Compatible    : True
Demand Exts Support    : False
In Overload State      : False
In External Overflow State : False
Exit Overflow Interval  : 0
Last Overflow Entered   : Never
Last Overflow Exit     : Never
External LSA Limit     : -1
Reference Bandwidth    : 100,000,000 Kbps
Init SPF Delay         : 1000 msec
Sec SPF Delay          : 1000 msec
Max SPF Delay          : 10000 msec
Min LS Arrival Interval : 1000 msec
Init LSA Gen Delay     : 5000 msec
Sec LSA Gen Delay      : 5000 msec
Max LSA Gen Delay     : 5000 msec
Lsa accumulate         : 1000 msec
Redistribute delay     : 1000 msec
Incremental SPF wait   : 1000 msec
Last Ext SPF Run       : Never
Ext LSA Cksum Sum      : 0x0
OSPF Last Enabled     : 05/27/2015 08:35:53
Unicast Import         : True
Multicast Import       : False
Export Policies        : None
Import Policies        : None
Lfa Policies           : None
OSPF Ldp Sync Admin Status : Enabled
LDP-over-RSVP         : Disabled
RSVP-Shortcut         : Disabled
Advertise-Tunnel-Link  : Disabled
LFA                   : Enabled
Remote-LFA            : Enabled
Export Limit           : 0
Export Limit Log Percent : 0
Total Exp Routes       : 0
RIB-priority-high prefix list: None
Segment Routing        : Enabled

```

Show Commands

```
=====
*A:Dut-C# show router ospf 1 status
```

```
=====
Rtr Base OSPFv2 Instance 1 Status
=====
```

```
OSPF Cfg Router Id      : 10.20.1.3
OSPF Oper Router Id    : 10.20.1.3
OSPF Version           : 2
OSPF Admin Status      : Enabled
OSPF Oper Status       : Enabled
Graceful Restart       : Disabled
GR Helper Mode         : Disabled
Preference              : 10
External Preference    : 150
Backbone Router        : True
Area Border Router     : False
AS Border Router       : True
Opaque LSA Support     : True
Traffic Engineering Support : False
RFC 1583 Compatible    : True
Demand Exts Support    : False
In Overload State      : False
In External Overflow State : False
Exit Overflow Interval : 0
Last Overflow Entered  : Never
Last Overflow Exit     : Never
External LSA Limit     : -1
Reference Bandwidth    : 100,000,000 Kbps
Init SPF Delay         : 1000 msec
Sec SPF Delay          : 1000 msec
Max SPF Delay          : 10000 msec
Min LS Arrival Interval : 1000 msec
Init LSA Gen Delay     : 5000 msec
Sec LSA Gen Delay      : 5000 msec
Max LSA Gen Delay      : 5000 msec
Lsa accumulate         : 1000 msec
Redistribute delay     : 1000 msec
Incremental SPF wait   : 1000 msec
Last Ext SPF Run       : Never
Ext LSA Cksum Sum      : 0x21502
OSPF Last Enabled     : 01/14/2014 14:33:07
Unicast Import         : True
Multicast Import       : False
Export Policies        : static
Import Policies        : None
Lfa Policies           : poll
OSPF Ldp Sync Admin Status : Enabled
LDP-over-RSVP         : Disabled
RSVP-Shortcut         : Disabled
Advertise-Tunnel-Link : Disabled
LFA                   : Enabled
Export Limit           : 0
Export Limit Log Percent : 0
Total Exp Routes       : 1
=====
```

virtual-link

Syntax `virtual-link [detail]`

Context `show>router>ospf`
`show>router>ospf3`

Description This command displays information for OSPF virtual links.

Parameters **detail** — Provides operational and statistical information about virtual links associated with this router.

Output **OSPF Virtual Link Output** — The following table describes OSPF virtual-link output fields.

Label	Description
Nbr Rtr ID	The router ID(s) of neighboring routers.
Area Id	A 32-bit integer which identifies an area.
Local Interface	The IP address of the local egress interface used to maintain the adjacency to reach this virtual neighbor.
Metric	The metric value associated with the route. This value is used when importing this static route into other protocols. When the metric is configured as zero then the metric configured in OSPF, default-import-metric, applies. This value is also used to determine which static route to install in the forwarding table.
State	The operational state of the virtual link to the neighboring router.
Authentication	Specifies whether authentication is enabled for the interface or virtual link.
Hello Intrval	Specifies the length of time, in seconds, between the Hello packets that the router sends on the interface.
Rtr Dead Intrvl	Specifies the total number of OSPF packets received where the dead interval given in the packet was not equal to that configured on this interface since the OSPF admin status was enabled.
Tot Rx Packets	Specifies the total number of OSPF packets received on this interface since the OSPF admin status was enabled.
Rx Hellos	Specifies the total number of OSPF Hello packets received on this interface since the OSPF admin status was enabled.
Rx DBDs	Specifies the total number of OSPF DataBase Description packets received on this interface since the OSPF administrative status was enabled.
Rx LSRs	Specifies the total number of Link State Requests (LSRs) received on this interface since the OSPF admin status was enabled.

Show Commands

Label	Description (Continued)
Rx LSUs	Specifies the total number of Link State Updates (LSUs) received on this interface since the OSPF admin status was enabled.
Rx LS Acks	Specifies the total number of Link State Acknowledgements received on this interface since the OSPF admin status was enabled.
Tot Tx Packets	Specifies the total number of OSPF packets transmitted on this virtual interface since it was created.
Tx Hellos	Specifies the total number of OSPF Hello packets transmitted on this virtual interface since it was created.
Tx DBDs	Specifies the total number of OSPF database description packets transmitted on this virtual interface.
Tx LSRs	Specifies the total number of OSPF Link State Requests (LSRs) transmitted on this virtual interface.
Tx LSUs	Specifies the total number of OSPF Hello packets transmitted on this interface since the OSPF admin status was enabled.
Tx LS Acks	Specifies the total number of OSPF Link State Acknowledgements (LSA) transmitted on this virtual interface.
Retransmits	Specifies the total number of OSPF retransmits sent on this interface since the OSPF admin status was last enabled.
Discards	Specifies the total number of OSPF packets discarded on this interface since the OSPF admin status was last enabled.
Bad Networks	Specifies the total number of OSPF packets received with invalid network or mask since the OSPF admin status was last enabled.
Bad Versions	Specifies the total number of OSPF packets received with bad OSPF version numbers since the OSPF admin status was last enabled.
Bad Areas	Specifies the total number of OSPF packets received with an area mismatch since the OSPF admin status was last enabled.
Bad Dest Addr	Specifies the total number of OSPF packets received with the incorrect IP destination address since the OSPF admin status was last enabled.
Bad Auth Types	Specifies the total number of OSPF packets received with an invalid authorization type since the OSPF admin status was last enabled.
Auth Failures	Specifies the total number of OSPF packets received with an invalid authorization key since the OSPF admin status was last enabled.
Bad Neighbors	Specifies the total number of OSPF packets received where the neighbor information does not match the information this router has for the neighbor since the OSPF admin status was last enabled.

Label	Description (Continued)
Bad Pkt Types	Specifies the total number of OSPF packets received with an invalid OSPF packet type since the OSPF admin status was last enabled.
Bad Lengths	Specifies the total number of OSPF packets received on this interface with a total length not equal to the length given in the packet itself since the OSPF admin status was last enabled.
Bad Hello Int.	Specifies the total number of OSPF packets received where the hello interval given in packet was not equal to that configured on this interface since the OSPF admin status was last enabled.
Bad Dead Int.	Specifies the total number of OSPF packets received where the dead interval given in the packet was not equal to that configured on this interface since the OSPF admin status was last enabled.
Bad Options	Specifies the total number of OSPF packets received with an option that does not match those configured for this interface or area since the OSPF admin status was last enabled.
Retrans Intrvl	Specifies the length of time, in seconds, that OSPF waits before retransmitting an unacknowledged link state advertisement (LSA) to an OSPF neighbor.
Transit Delay	Specifies the time, in seconds, that it takes to transmit a link state advertisement (LSA) on the interface or virtual link.
Last Event	Specifies the date and time when an event was last associated with this OSPF interface.

Sample Output

```
A:ALA-A# show router ospf 1 virtual-link
```

```
=====
Rtr Base OSPFv2 Instance 1 Virtual Links
=====
```

Nbr	Rtr Id	Area Id	Local Interface	Metric	State
180.0.0.10		0.0.0.1	180.1.7.12	300	PToP
180.0.0.10		0.0.0.2	180.2.7.12	300	PToP

```
-----
No. of OSPF Virtual Links: 2
=====
```

```
A:ALA-A# show router ospf virtual-link detail
```

```
=====
Rtr Base OSPFv2 Instance 1 Virtual Links (detail)
=====
```

```
Neighbor Router Id : 180.0.0.10
```

Show Commands

```
-----  
Nbr Router Id : 180.0.0.10          Area Id       : 0.0.0.1  
Local Interface: 180.1.7.12         Metric        : 300  
State          : Point To Point     Admin State   : Up  
Hello Intrvl  : 10 sec              Rtr Dead Intrvl: 60 sec  
Tot Rx Packets : 43022              Tot Tx Packets : 42964  
Rx Hellos     : 24834              Tx Hellos     : 24853  
Rx DBDs       : 3                  Tx DBDs       : 2  
Rx LSRs       : 0                  Tx LSRs       : 0  
Rx LSUs       : 15966             Tx LSUs       : 16352  
Rx LS Acks    : 2219              Tx LS Acks    : 1757  
Retransmits   : 0                  Discards      : 0  
Bad Networks  : 0                  Bad Versions  : 0  
Bad Areas     : 0                  Bad Dest Adrs : 0  
Bad Auth Types : 0                 Auth Failures : 0  
Bad Neighbors : 0                  Bad Pkt Types : 0  
Bad Lengths   : 0                  Bad Hello Int. : 0  
Bad Dead Int. : 0                  Bad Options   : 0  
Retrans Intrvl : 5 sec             Transit Delay  : 1 sec  
Last Event    : 11/07/2006 17:11:56 Authentication : None  
-----  
Neighbor Router Id : 180.0.0.10  
-----  
Nbr Router Id : 180.0.0.10          Area Id       : 0.0.0.2  
Local Interface: 180.2.7.12         Metric        : 300  
State          : Point To Point     Admin State   : Up  
Hello Intrvl  : 10 sec              Rtr Dead Intrvl: 60 sec  
Tot Rx Packets : 43073              Tot Tx Packets : 43034  
Rx Hellos     : 24851              Tx Hellos     : 24844  
Rx DBDs       : 3                  Tx DBDs       : 2  
Rx LSRs       : 1                  Tx LSRs       : 1  
Rx LSUs       : 18071             Tx LSUs       : 17853  
Rx LS Acks    : 147                Tx LS Acks    : 334  
Retransmits   : 0                  Discards      : 0  
Bad Networks  : 0                  Bad Versions  : 0  
Bad Areas     : 0                  Bad Dest Adrs : 0  
Bad Auth Types : 0                 Auth Failures : 0  
Bad Neighbors : 0                  Bad Pkt Types : 0  
Bad Lengths   : 0                  Bad Hello Int. : 0  
Bad Dead Int. : 0                  Bad Options   : 0  
Retrans Intrvl : 5 sec             Transit Delay  : 1 sec  
Last Event    : 11/07/2006 17:12:00 Authentication : MD5  
=====
```

A:ALA-A#

virtual-neighbor

Syntax `virtual-neighbor [remote router-id] [detail]`

Context `show>router>ospf`
`show>router>ospf3`

Description This command displays virtual neighbor information.

Parameters **remote** *router-id* — Displays the specified router ID. This reduces the amount of output displayed.

detail — Produces detailed information on the virtual neighbor. This option produces a large amount of data. It is recommended to use **detail** only when requesting information for a specific neighbor.

Output **OSPF Virtual Neighbor Output** — The following table describes OSPF virtual neighbor output fields.

Label	Description
Nbr IP Addr	The IP address this neighbor is using in its IP source address. Note that, on addressless links, this will not be 0.0.0.0, but the address of another of the neighbor's interfaces.
Nbr Rtr ID	Specifies the router ID(s) of neighboring routers.
Transit Area	Specifies the transit area ID that links the backbone area with the area that has no physical connection with the backbone.
Retrans Q Length	The current length of the retransmission queue.
No. of Neighbors	Specifies the total number of OSPF neighbors adjacent on this interface, in a state of INIT or greater, since the OSPF admin status was enabled.
Nbr State	Specifies the operational state of the virtual link to the neighboring router.
Options	Specifies the total number of OSPF packets received with an option that does not match those configured for this virtual interface or transit area since the OSPF admin status was enabled.
Events	Specifies the total number of events that have occurred since the OSPF admin status was enabled.
Last Event Time	Specifies the date and time when an event was last associated with this OSPF interface.
Up Time	Specifies the uninterrupted time, in hundredths of seconds, the adjacency to this neighbor has been up.
Time Before Dead	Specifies the amount of time, in seconds, until the dead router interval expires.
Bad Nbr States	Specifies the total number of OSPF packets received where the neighbor information does not match the information this router has for the neighbor since the OSPF admin status was last enabled.

Show Commands

Label	Description (Continued)
LSA Inst fails	Specifies the total number of times an LSA could not be installed into the LSDB due to a resource allocation issue since the OSPF admin status was last enabled.
Bad Seq Nums	Specifies the total number of times when a database description packet was received with a sequence number mismatch since the OSPF admin status was last enabled.
Bad MTUs	Specifies the total number of times when the MTU in a received database description packet was larger than the MTU of the receiving interface since the OSPF admin status was enabled.
Bad Packets	Specifies the total number of times when an LS update was received with an illegal LS type or an option mismatch since the OSPF admin status was enabled.
LSA not in LSDB	Specifies the total number of times when an LS request was received for an LSA not installed in the LSDB of this router since the OSPF admin status was enabled.
Option Mismatches	Specifies the total number of times when a LS update was received with an option mismatch since the OSPF admin status was enabled.
Nbr Duplicates	Specifies the total number of times when a duplicate database description packet was received during the Exchange state since the OSPF admin status was enabled.

Sample Output

```
A:ALA-A# show router ospf 1 virtual-neighbor
=====
Rtr Base OSPFv2 Instance 1 Virtual Neighbors
=====
Nbr IP Addr      Nbr Rtr Id      Nbr State Transit Area  RetxQ Len  Dead Time
-----
180.1.6.10       180.0.0.10     Full    0.0.0.1         0        58
180.2.9.10       180.0.0.10     Full    0.0.0.2         0        52
-----
No. of Neighbors: 2
=====
A:ALA-A#
A:ALA-A# show router ospf virtual-neighbor detail
=====
Rtr Base OSPFv2 Instance 0 Virtual Neighbors (detail)
=====
Virtual Neighbor Router Id : 180.0.0.10
-----
Neighbor IP Addr : 180.1.6.10           Neighbor Rtr Id : 180.0.0.10
Neighbor State   : Full                 Transit Area    : 0.0.0.1
```

```
Retrans Q Length : 0           Options           : -E--
Events           : 4           Last Event Time  : 11/07/2006 17:11:56
Up Time         : 2d 17:47:17  Time Before Dead : 57 sec
Bad Nbr States  : 1           LSA Inst fails  : 0
Bad Seq Nums    : 0           Bad MTUs        : 0
Bad Packets     : 0           LSA not in LSDB : 0
Option Mismatches: 0         Nbr Duplicates  : 0
```

```
-----
Virtual Neighbor Router Id : 180.0.0.10
-----
```

```
Neighbor IP Addr : 180.2.9.10      Neighbor Rtr Id  : 180.0.0.10
Neighbor State   : Full            Transit Area     : 0.0.0.2
Retrans Q Length : 0           Options         : -E--
Events          : 4           Last Event Time  : 11/07/2006 17:11:59
Up Time        : 2d 17:47:14  Time Before Dead : 59 sec
Bad Nbr States  : 1           LSA Inst fails  : 0
Bad Seq Nums    : 0           Bad MTUs        : 0
Bad Packets     : 0           LSA not in LSDB : 0
Option Mismatches: 0         Nbr Duplicates  : 0
```

```
=====
A:ALA-A#
```

Clear Commands

ospf

Syntax	ospf [<i>ospf-instance</i>]
Context	clear>router
Description	This command clears and resets OSPF protocol entities.
Parameters	<i>ospf-instance</i> — Clears the specified OSPF instance.
Values	1 — 31

ospf3

Syntax	ospf [<i>ospf-instance</i>]
Context	clear>router
Description	This command clears and resets OSPF3 protocol entities.
Parameters	<i>ospf-instance</i> — Clears the specified OSPF3 instance.
Values	0 — 31 64 — 95 0 — 31 ipv6-unicast address-family 64 — 95 ipv4-unicast address-family

database

Syntax	database [<i>purge</i>]
Context	clear>router>ospf clear>router>ospf3
Description	This command clears all LSAs received from other nodes. Sets all adjacencies better than two way to one way. Refreshes all self originated LSAs
Parameters	purge — The purge parameter also clears all self-originated LSAs and re-originates all self-originated LSAs

export

Syntax **export**

Context clear>router>ospf
clear>router>ospf3

Description Re-evaluates all effective export policies

neighbor

Syntax **neighbor** [*ip-int-name* | *ip-address*]

Context clear>router>ospf
clear>router>ospf3

Description Marks the neighbor as dead and re-initiates the affected adjacencies.

Parameters *ip-int-name* — Clear all neighbors for the interface specified by this interface name.

ip-address — Clear all neighbors for the interface specified by this IP-address

overload

Syntax **overload** {*rtm* | *fib* | *rtr-adv-lsa-limit*}

Context clear>router>ospf
clear>router>ospf3

Description This command clears the OSPF/OSPF3 overload.

Parameters *rtm* — Clears the overload because OSPF/OSPF3 reached the configured maximum route limit set with **maximum-routes** or **maximum-ipv6-routes** in a VPRN.

fib — Clears the overload because adding routes to the hardware FIB failed.

rtr-adv-lsa-limit — Clears the overload because OSPF/OSPF3 exceeded the configured maximum limit on LSAs advertised by another router, which was set with **rtr-adv-lsa-limit**.

statistics

Syntax **statistics**

Context clear>router>ospf
clear>router>ospf3

Description Clears all neighbor, router, interface, SPF and global statistics of this OSPF instance.

OSPF Debug Commands

ospf

Syntax	ospf [<i>ospf-instance</i>]
Context	debug>router
Description	Indicates the OSPF instance for debugging purposes.
Parameters	<i>ospf-instance</i> — The OSPF instance.
Values	1 — 31

ospf3

Syntax	ospf3 [<i>ospf-instance</i>]
Context	debug>router
Description	Indicates the OSPF3 instance for debugging purposes.
Parameters	<i>ospf-instance</i> — Clears the specified OSPF3 instance.
Values	0 — 31 64 — 95 0 — 31 ipv6-unicast address-family 64 — 95 ipv4-unicast address-family

area

Syntax	area [<i>area-id</i>] no area
Context	debug>router>ospf debug>router>ospf3
Description	This command enables debugging for an OSPF area.
Parameters	<i>area-id</i> — Specify the OSPF area ID expressed in dotted decimal notation or as a 32-bit decimal integer.

area-range

Syntax	area-range [<i>ip-address</i>] no area-range
Context	debug>router>ospf debug>router>ospf3
Description	This command enables debugging for an OSPF area range.
Parameters	<i>ip-address</i> — Specify the IP address for the range used by the ABR to advertise the area into another area.

cspf

Syntax	cspf [<i>ip-address</i>] no cspf
Context	debug>router>ospf debug>router>ospf3
Description	This command enables debugging for an OSPF constraint-based shortest path first (CSPF).
Parameters	<i>ip-address</i> — Specify the IP address for the range used for CSPF.

graceful-restart

Syntax	[no] graceful-restart
Context	debug>router>ospf debug>router>ospf3
Description	This command enables debugging for OSPF and OSPF3 graceful-restart.

interface

Syntax	interface [<i>ip-int-name</i> <i>ip-address</i>] no interface
Context	debug>router>ospf debug>router>ospf3
Description	This command enables debugging for an OSPF and OSPF3 interface.
Parameters	<i>ip-int-name</i> — Specify the IP interface name. An interface name cannot be in the form of an IP address. Interface names can be any string up to 32 characters long composed of printable, 7-bit ASCII

OSPF Debug Commands

characters. If the string contains special characters (#, \$, spaces, etc.), the entire string must be enclosed within double quotes.

ip-address — Specify the interface's IP address.

leak

Syntax **leak** [*ip-address*]
no leak

Context debug>router>ospf
debug>router>ospf3

Description This command enables debugging for OSPF leaks.

Parameters *ip-address* — Specify the IP address to debug OSPF leaks.

lsdb

Syntax **lsdb** [*type*] [*ls-id*] [*adv-rtr-id*] [**area** *area-id*]
no lsdb

Context debug>router>ospf
debug>router>ospf3

Description This command enables debugging for an OSPF link-state database (LSDB).

Parameters *type* — Specifies the OSPF link-state database (LSDB) type.

Values router, network, summary, asbr, extern, nssa, area-opaque, as-opaque, link-opaque

ls-id — Specifies an LSA type specific field containing either a router ID or an IP address. It identifies the piece of the routing domain being described by the advertisement.

adv-rtr-id — Specifies the router identifier of the router advertising the LSA.

area *area-id* — Specifies a 32-bit integer uniquely identifying an area.

misc

Syntax [**no**] **misc**

Context debug>router>ospf
debug>router>ospf3

Description This command enables debugging for miscellaneous OSPF events.

neighbor

Syntax	neighbor [<i>ip-int-name</i> <i>ip-address</i>] no neighbor
Context	debug>router>ospf debug>router>ospf3
Description	This command enables debugging for an OSPF or OSPF3 neighbor.
Parameters	<i>ip-int-name</i> — Specifies the neighbor interface name. <i>ip-address</i> — Specifies neighbor information for the neighbor identified by the the specified router ID.

nssa-range

Syntax	nssa-range [<i>ip-address</i>] no nssa-range
Context	debug>router>ospf debug>router>ospf3
Description	This command enables debugging for an NSSA range.
Parameters	<i>ip-address</i> — Specifies the IP address range to debug.

packet

Syntax	packet [<i>packet-type</i>] [<i>ip-address</i>] no packet										
Context	debug>router>ospf debug>router>ospf3										
Description	This command enables debugging for OSPF packets.										
Parameters	<i>packet-type</i> — Specifies the OSPF packet type to debug. Values hello, dbdescr, lsrequest, lsupdate, lsack <i>ip-address</i> — Specifies the IP address to debug. Values <table> <tr> <td>ipv4-address:</td> <td>a.b.c.d</td> </tr> <tr> <td>ipv6-address:</td> <td>x:x:x:x:x:x:x (eight 16-bit pieces)</td> </tr> <tr> <td></td> <td>x:x:x:x:x:d.d.d.d</td> </tr> <tr> <td></td> <td>x: [0 — FFFF]H</td> </tr> <tr> <td></td> <td>d: [0 — 255]D</td> </tr> </table>	ipv4-address:	a.b.c.d	ipv6-address:	x:x:x:x:x:x:x (eight 16-bit pieces)		x:x:x:x:x:d.d.d.d		x: [0 — FFFF]H		d: [0 — 255]D
ipv4-address:	a.b.c.d										
ipv6-address:	x:x:x:x:x:x:x (eight 16-bit pieces)										
	x:x:x:x:x:d.d.d.d										
	x: [0 — FFFF]H										
	d: [0 — 255]D										

OSPF Debug Commands

rtm

Syntax	rtm [<i>ip-address</i>] no rtm
Context	debug>router>ospf debug>router>ospf3
Description	This command enables debugging for OSPF RTM.
Parameters	<i>ip-address</i> — Specifies the IP address to debug. Values ipv4-address: a.b.c.d ipv6-address: x:x:x:x:x:x:x (eight 16-bit pieces) x:x:x:x:x:d.d.d.d x: [0 — FFFF]H d: [0 — 255]D

spf

Syntax	spf [<i>type</i>] [<i>dest-addr</i>] no spf
Context	debug>router>ospf
Description	This command enables debugging for OSPF SPF. Information regarding overall SPF start and stop times will be shown. To see detailed information regarding the SPF calculation of a given route, the route must be specified as an optional argument.
Parameters	<i>type</i> — Specifies the area to debug Values intra-area, inter-area, external <i>dest-addr</i> — Specifies the destination IP address to debug.

virtual-neighbor

Syntax	virtual-neighbor [<i>ip-address</i>] no virtual-neighbor
Context	debug>router>ospf
Description	This command enables debugging for an OSPF virtual neighbor.
Parameters	<i>ip-address</i> — Specifies the IP address of the virtual neighbor.