OSPFv3 (IPv6)

OSPFv3 Key Attributes

Official Release:	OSPFv3 (IPv6) – RFC2740 (1999), RFC5340
Protocol Type/Class:	IPv6 / Link-State
Address Format:	128-bit
Router ID & Area ID:	32-bit
Algorithm/Type:	SPF (Dijkstra) / IGP
Metric:	Cost (Bandwidth)
Adjacency address:	IPv6 Link Local Address (FE80::/10) *(IPv4 In OSPFv2)*
Authentication Supported?	YES (IPv6's IPSec)
Hierarchy Type:	2-Level hierarchy with Area0 at the Core
ABR/ASBR Model:	YES
No. of packet types:	**5** (Hello, DBD, LSR, LSU, LSAck)
Interface Types:	Broadcast, P2P, P2Mp, NBMA, Virtual Links
Router Types:	IR, BR, ABR, ASBR
Flooding Scope Bits:	U/S2/S1
Reference BW:	10^8
Header Size:	16 Bytes (which is 24 Bytes for OSPFv2)
Multiple Instances Per Link Supported?	YES
Protocol processing:	Per Link (not per subnet as for OSPFv2)

OSPFv3 Route Summarization

Summ Type	Detail
Inter-Area Route Summarization	- Configured on ABRs - Recommended contiguous ranges
External Route Summarization	- Injected into OSPFv3 domain using route redistribution - Prone to overlapping range issues

OSPFv3 Multicast Address

Scope	Multicast Address
FF02::5	All OSPF Routers
FF02::6	All OSPF DR Routers

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OSPFv3(IPv6) LSA -Vs- OSPFv2(IPv4) LSA

|	OSPFv3		OSPFv2
LSA#	**LSA Type**	**LSA#**	**LSA Type**
0x2001	Router LSA	1	Router LSA
0x2002	Network LSA	2	Network LSA
0x2003	*Inter Area Prefix LSA*	3	Network Summary LSA
0x2004	*Inter Area Router LSA*	4	ASBR Summary LSA
0x4005	AS-External LSA	5	AS-External LSA
0x2006	Group Membership LSA	6	Multicast Group Membership LSA
0x2007	Type-7 LSA	7	NSSA External LSA
0x0008	Link LSA - *New*	8	External attributes LSA (for BGP)
0x2009	Intra-area Prefix LSA - *New*	9/10/11	Future use - AS Opaque

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OSPF Configuration & Verification on different Vendors

Usage	Cisco	Juniper	Huawei	Nokia/ALU	Tellabs/Coriant
Basic OSPF Configuration	R1#config t R1(config)#router ospf 1 R1(config-router)#router-id 1.1.1.1 R1(config-router)#network 1.1.1.1 255.255.255.255 area 0 R1(config-router)#network 12.12.12.0 0.0.0.255 area 0	[edit] user@host# set protocols ospf area 0.0.0.0 interface ge-0/0/0 user@host# set protocols ospf area 0.0.0.0 interface lo0.0	<R1> system-view [R1] router id 1.1.1.1 [R1] ospf 1 [R1-ospf-1] area 0 [R1-ospf-1-area-0.0.0.0] network 1.1.1.1 255.255.255.255 [R1-ospf-1-area-0.0.0.0] network 12.12.12.0 0.0.0.255	A:R1# configure router router-id 1.1.1.1 A:R1# configure router ospf A:R1>config>router>ospf# area 0 A:R1>config>router>ospf>area# interface "system" A:R1>config>router>ospf>area>if# back A:R1>config>router>ospf>area# interface "PORT12"	#config t R1(config)#router ospf 1 R1(config-router)##ospf router-id 1.1.1.1 R1(config-router)#network 1.1.1.1/32 area 0.0.0.0 R1(config-router)#network 12.12.12.0/24 area 0.0.0.0
Basic OSPF Show Commands	R1#show ip ospf neighbor R1#show ip ospf interface R1#show ip route ospf R1#show ip ospf database R1#show ip protocols, R1#show ip ospf R1#show ip ospf neighbor detail	user@host# show ospf neighbor user@host# show ospf interface user@host# show ospf route user@host# show ospf route protocol ospf user@host# show ospf database user@host# show ospf neighbor extensive	<R1> display ip routing-table <R1> display ospf peer <R1> display ospf interface Fa0/0/0 <R1> display ospf routing 1.1.1.1 <R1> display ospf brief	A:R1# show router ospf neighbor A:R1# show router ospf interface A:R1# show router ospf routes A:R1# show router ospf database A:R1# show router ospf status A:R1# clear router ospf neighbor *info at any context	R1#show ip ospf neighbor R1#show ip ospf interface R1#show ip route ospf R1#show ip ospf database R1#show ip ospf R1#show ip route

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Network Walks Reference Topology 1

12.12.12.0/24

R1 — .1 Fa0/0 ———— .2 Fa0/1 — R2

Lo: 1.1.1.1/32   Lo: 2.2.2.2/32
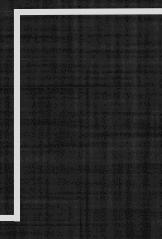
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