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# Module 2 – OSPF(v3) Config



***Lab Tasks:***

After Module-1, you can only reach the directly connected neighbours (only the directly connected interfaces), but not the other routers in your network (R1-R12).

To be able to reach all routers within your network, we need to deploy interior gateway routing (IGP) protocols like OSPF and IS-IS.

In this lab, we will run OSPFv3 to carry both IPv4 and IPv6 AFs. This helps consolidate both AFs under a single OSPF process (as opposed to running two separate OSPF processes, OSPFv2/v3 for IPv4 and IPv6).

Take note of the following:

1. To scale, it is advisable to *only* carry your infrastructure prefixes in IGP (loopbacks and point-to-point addresses), but not customer routes/prefixes (which includes the customer point-to-point links).
2. The whole network (R1-R12) runs in OSPF area-0 (backbone area).
3. After finishing OSPFv3 configuration we should see the following 26 new prefixes in all infrastructure routers’ routing table.

|  |  |  |
| --- | --- | --- |
| **Loopback** | **Point-to-point** | **Transport** |
| R1=> 2406:6400::1/128 | R2-R1=> 2406:6400:e::/64 | Purple=> 2406:6400:2::/48 |
| R2=> 2406:6400::2/128 | R2-R3=> 2406:6400:e:1::/64 | Green=> 2406:6400:3::/48 |
| R3=> 2406:6400::3/128 | R1-R3=> 2406:6400:e:2::/64 |  |
| R4=> 2406:6400::4/128 | R5-R4=> 2406:6400:e:10::/64 |  |
| R5=> 2406:6400::5/128 | R5-R6=> 2406:6400:e:11::/64 |  |
| R6=> 2406:6400::6/128 | R4-R6=> 2406:6400:e:12::/64 |  |
| R7=> 2406:6400::7/128 | R8-R7=> 2406:6400:e:20::/64 |  |
| R8=> 2406:6400::8/128 | R8-R9=> 2406:6400:e:21::/64 |  |
| R9=> 2406:6400::9/128 | R7-R9=> 2406:6400:e:22::/64 |  |
| R10=> 2406:6400::10/128 | R11-R10=> 2406:6400:e:30::/64 |  |
| R11=> 2406:6400::11/128 | R11-R12=> 2406:6400:e:31::/64 |  |
| R12=> 2406:6400::12/128 | R11-R12=> 2406:6400:e:32::/64 |  |

## ***Lab Exercise***

1. **OSPFv3 Configuration:**

Since OSPFv3 messages are sent over IPv6 (sourced using the router’s link-local address) for both IPv4 and IPv6, make sure IPv6 is enabled on the router first, and the interfaces have IPv6 addresses configured.

* If there are no active IPv4 addresses configured, we need to manually configure a 32-bit router-ID

**Example OSPFv3 config on a R1:**

config t

router ospfv3 17821

address-family ipv4 unicast

router-id 1.1.1.1

passive-interface lo0

exit

address-family ipv6 unicast

router-id 1.1.1.1

passive-interface lo0

exit

exit

To advertise networks (both IPv4 and IPv6) into OSPFv3, you need to enable OSPFv3 directly on the interfaces; there is no “**network**” command in OSPFv3.

interface Loopback 0

ospfv3 17821 ipv4 area 0

ospfv3 17821 ipv6 area 0

exit

Since we are using ethernet links (which are broadcast/multi-access interfaces) as point-to-point links, to avoid the election of DR/BDR, we need to explicitly tell OSPF process that they are point-to-point links

interface e1/0

ospfv3 17821 ipv4 area 0

ospfv3 17821 ipv6 area 0

ospfv3 network point-to-point

exit

interface e1/1

ospfv3 17821 ipv4 area 0

ospfv3 17821 ipv6 area 0

ospfv3 network point-to-point

exit

wr

1. **Verify OSPFv3 configuration:**

sh ospfv3 neighbors ! Check OSPFv3 neighbor table

sh ospfv3 database ! Check OSPFv3 topology table

sh ip route ospfv3 ! Check ipv4 routes/prefixes learned through OSPFv3

sh ipv6 route ospf ! Check ipv6 routes/prefixes learn through OSPFv3

1. **Verify Reachability**

Make sure you can reach (**ping**) all other routers in the network (loopbacks and point-to-points).

END OF MODULE TWO……