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**Welcome
To
Network for you
OSPF Path Selection**



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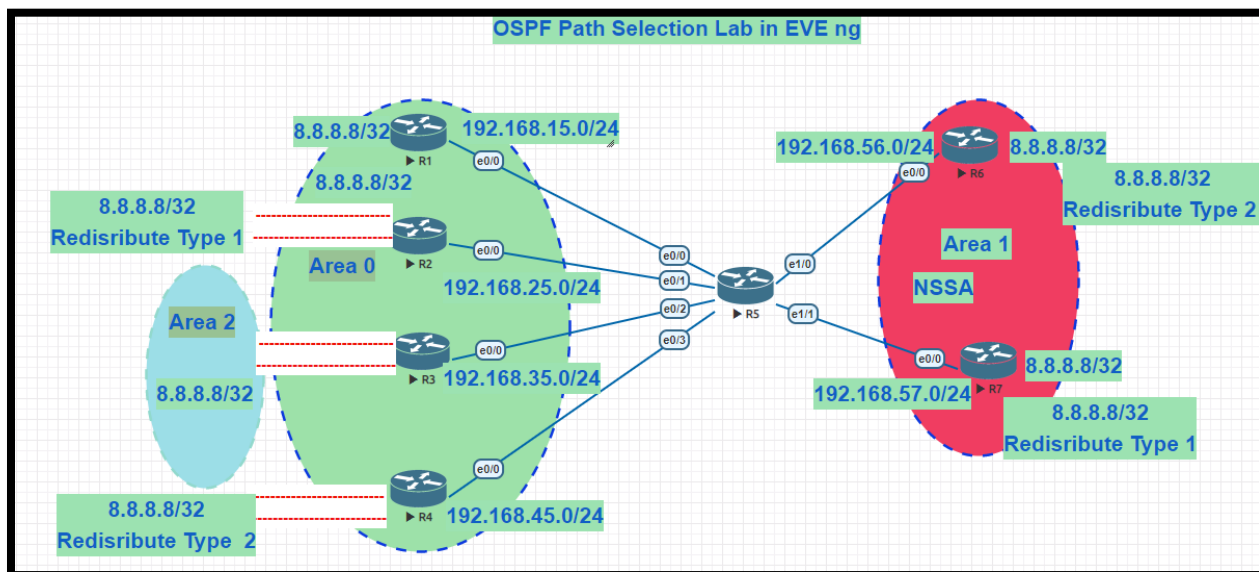
OSPF Path Selection:

- OSPF will use cost as the metric to choose the shortest path for each destination, this is true but it's not entirely correct.
- OSPF will first look at the "type of path" to make a decision and secondly look at the metric.
- In OSPF, the Intra-Area is when routes or traffic are inside the area itself.
- In OSPF, the Inter-Area is when the routes or traffic are outside the area.
- This is the preferred path list that OSPF uses:
 - ✓ Intra-Area (O)
 - ✓ Inter-Area (O IA)
 - ✓ External Type 1 (E1)
 - ✓ NSSA Type 1 (N1)
 - ✓ External Type 2 (E2)
 - ✓ NSSA Type 2 (N2)

O > OIA > N1 > E1 > N2 > E2 for 15 & above Version

O > OIA > E1 > E2 > N1 > N2 for below 15 Version

Let check with lab:



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L3-ADVENTERPRISEK9-M-15.2-M5.3.bin

Use this image for this lab in eve ng:

R1 Configuration:	R2 Configuration:
<pre>en config t hostname R1 int e0/0 ip add 192.168.15.1 255.255.255.0 no sh int lo0 ip add 8.8.8.8 255.255.255.255 router ospf 1 router-id 1.1.1.1 int e0/0 ip ospf 1 area 0 int lo0 ip ospf 1 area 0</pre>	<pre>en config t hostname R2 int e0/0 ip add 192.168.25.1 255.255.255.0 no sh int lo0 ip add 8.8.8.8 255.255.255.255 router ospf 1 router-id 2.2.2.2 int e0/0 ip ospf 1 area 0 exit router ospf 1 redistribute connected subnets metric-type 1</pre>
R3 Configuration:	R4 Configuration:
<pre>en config t hostname R3 int e0/0 ip add 192.168.35.1 255.255.255.0 no sh int lo0 ip add 8.8.8.8 255.255.255.255 router ospf 1 router-id 3.3.3.3 int e0/0 ip ospf 1 area 0</pre>	<pre>en config t hostname R4 int e0/0 ip add 192.168.45.1 255.255.255.0 no sh int lo0 ip add 8.8.8.8 255.255.255.255 router ospf 1 router-id 4.4.4.4 int e0/0 ip ospf 1 area 0 exit</pre>

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int lo0 ip ospf 1 area 2	router ospf 1 redistribute connected subnets metric-type 2
R5 Configuration:	R6 Configuration:
en config t hostname R5 int e0/0 ip add 192.168.15.2 255.255.255.0 no sh int e0/1 ip add 192.168.25.2 255.255.255.0 no sh int e0/2 ip add 192.168.35.2 255.255.255.0 no sh int e0/3 ip add 192.168.45.2 255.255.255.0 no sh int e1/0 ip add 192.168.56.1 255.255.255.0 no sh int e1/1 ip add 192.168.57.1 255.255.255.0 no sh router ospf 1 router-id 5.5.5.5 int e0/0 ip ospf 1 area 0 int e0/1 ip ospf 1 area 0 int e0/2 ip ospf 1 area 0 int e0/3 ip ospf 1 area 0 int e1/0 ip ospf 1 area 1 int e1/1 ip ospf 1 area 1 exit router ospf 1	en config t hostname R6 int e0/0 ip add 192.168.56.2 255.255.255.0 no sh router ospf 1 int e0/0 ip ospf 1 area 1 exit router ospf 1 redistribute connected subnets metric-type 2 area 1 nssa

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area 1 nssa	
R7 Configuration:	
en config t hostname R7 int e0/0 ip add 192.168.57.2 255.255.255.0 no sh router ospf 1 int e0/0 ip ospf 1 area 1 exit router ospf 1 redistribute connected subnets metric-type 1 area 1 nssa	

```
R5#sh ip route ospf
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
a - application route
+ - replicated route, % - next hop override

Gateway of last resort is not set

0.0.0.0/32 is subnetted, 1 subnets
0.0.0.0 [110/11] via 192.168.15.1, 00:02:35, Ethernet0/0
```

R1 Loopback Shutdown
Interface loopback 0 shutdown

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```
R5#sh ip route ospf
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
       a - application route
       + - replicated route, % - next hop override

Gateway of last resort is not set

      8.0.0.0/32 is subnetted, 1 subnets
O IA   8.8.8.8 [110/11] via 192.168.35.1, 00:00:06, Ethernet0/2
```

R3 Loopback Shutdown

Interface loopback 0
shutdown

```
R5#sh ip route ospf
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
       a - application route
       + - replicated route, % - next hop override

Gateway of last resort is not set

      8.0.0.0/32 is subnetted, 1 subnets
O_N1  8.8.8.8 [110/30] via 192.168.57.2, 00:00:16, Ethernet1/1
```

R7 Loopback Shutdown

Interface loopback 0
shutdown

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```
R5#sh ip route ospf
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
a - application route
+ - replicated route, % - next hop override

Gateway of last resort is not set

      8.0.0.0/32 is subnetted, 1 subnets
O E1   8.8.8.8 [110/30] via 192.168.25.1, 00:00:13, Ethernet0/1
```

R2 Loopback Shutdown

Interface loopback 0
shutdown

```
R5#sh ip route ospf
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
a - application route
+ - replicated route, % - next hop override

Gateway of last resort is not set

      8.0.0.0/32 is subnetted, 1 subnets
O N2   8.8.8.8 [110/20] via 192.168.56.2, 00:00:38, Ethernet1/0
```

R6 Loopback Shutdown

Interface loopback 0
shutdown

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```
R5#sh ip route ospf
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
a - application route
+ - replicated route, % - next hop override

Gateway of last resort is not set

8.0.0.0/32 is subnetted, 1 subnets
O_E2    8.8.8.8 [110/20] via 192.168.45.1, 00:00:09, Ethernet0/3
```

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