Packet Tracer Single Area OSPFv2

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Purpose

The purpose of this lab is to remember how to do single area OSPF in ipv4 through multiple networks in the same area. To get us back to be familiar with troubleshooting problems with the given topology. We will also be given our first lab write-up and learn how to write it correctly.

Background

Open Shortest Path First (OSPF) can be used in a single area OSPF or multi area OSPF with OSPFv2 for ipv4 and OPSFv3 or ipv6. Developed by the Internet Engineering Task Force (IETF) to become the replacement of RIP, as an independent vendor and became the most used routing protocol by enterprise networks now a days. Based on Dijkstra’s algorithm which generates link-state packets with local info for each router. Each router exchanges local and external link state info allowing it to create the shortest path possible to a selected destination. Some advantages to use OSPF verse RIP or EIGRP are it provides shortest path routing with fast to fault discovery and rerouting. OSPF uses hello packets to verify router connection with each other and is the highest performance open standard routing protocol to operate with large networks. Unlike RIP which is limited to have a maximum hop count of 15 hops but with a higher administrative distance of 120. Some disadvantages of OSPF are it consumes a higher processing and memory than RIP and consumes a large amount of bandwidth at the start of link-state packet flooding. In some cases, EIGRP could be better on a network as its main selling point is how easy to configure it is over OSPF, with a faster converge and additional back up routes. Although, the major downside with using EIGRP is it can be only used on cisco networks and not any other vendors.

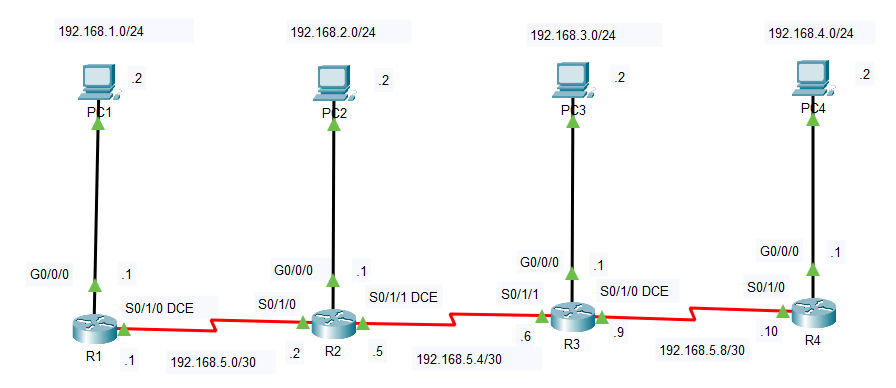
Lab Summary

In Packet Tracer, I set up a local area network using 4 routers and 4 PCs as end devices, creating a different LAN with each connect. There was a total of 7 networks with 4 of them between the PC’s Fa0/0 interface and the router’s G0/0/0 interface, with the PC’s being .2/24 and routers being .1/24. The other 3 networks were /30’s used on the serial interfaces between routers. Each PC is label with its respected network, and between each router is the network for the serial interfaces. Each router was given the network address that they were connected to allow OSPF to run and router-id from router 1 with 1.1.1.1. and so on.

Lab Commands

* **router ospf [process-id]** – Create an OSPF routing process and enter router configuration mode
* **router-id** – Assigns the router with an OSPF ID
* **network area wildcard-mask area area #** – Configure the interfaces that OSPF will be enabled on
* **show run** – Shows the configuration of the router
* **ping [ip address] –** Checks the connection between devices
* **show ip route** – Shows current router’s routing table
* **show ip protocol** – Shows the areas OSPF is configured the device with router-id and networks
* **show ip ospf neighbor –** Shows neighboring router’s serial interface status and router-id
* **show ip ospf interface –** Shows the ospf configuration of the interfaces on the router
* **clock rate** – Allows routers to be synchronized with each other on the same rate

Network Diagram with IP’s



Configurations

**PC1**

C:\>**ping 192.168.2.2**

Pinging 192.168.2.2 with 32 bytes of data:

Reply from 192.168.2.2: bytes=32 time=2ms TTL=126

Reply from 192.168.2.2: bytes=32 time=1ms TTL=126

Reply from 192.168.2.2: bytes=32 time=1ms TTL=126

Reply from 192.168.2.2: bytes=32 time=3ms TTL=126

Ping statistics for 192.168.2.2:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 1ms, Maximum = 3ms, Average = 1ms

C:\>**ping 192.168.3.2**

Pinging 192.168.3.2 with 32 bytes of data:

Reply from 192.168.3.2: bytes=32 time=3ms TTL=125

Reply from 192.168.3.2: bytes=32 time=4ms TTL=125

Reply from 192.168.3.2: bytes=32 time=3ms TTL=125

Reply from 192.168.3.2: bytes=32 time=2ms TTL=125

Ping statistics for 192.168.3.2:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 2ms, Maximum = 4ms, Average = 3ms

C:\>**ping 192.168.4.2**

Pinging 192.168.4.2 with 32 bytes of data:

Reply from 192.168.4.2: bytes=32 time=11ms TTL=124

Reply from 192.168.4.2: bytes=32 time=5ms TTL=124

Reply from 192.168.4.2: bytes=32 time=5ms TTL=124

Reply from 192.168.4.2: bytes=32 time=18ms TTL=124

Ping statistics for 192.168.4.2:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 5ms, Maximum = 18ms, Average = 9ms

**PC2**

C:\>**ping 192.168.1.2**

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=1ms TTL=126

Reply from 192.168.1.2: bytes=32 time=10ms TTL=126

Reply from 192.168.1.2: bytes=32 time=12ms TTL=126

Reply from 192.168.1.2: bytes=32 time=3ms TTL=126

Ping statistics for 192.168.1.2:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 1ms, Maximum = 12ms, Average = 6ms

C:\>**ping 192.168.3.2**

Pinging 192.168.3.2 with 32 bytes of data:

Reply from 192.168.3.2: bytes=32 time=2ms TTL=126

Reply from 192.168.3.2: bytes=32 time=15ms TTL=126

Reply from 192.168.3.2: bytes=32 time=2ms TTL=126

Reply from 192.168.3.2: bytes=32 time=3ms TTL=126

Ping statistics for 192.168.3.2:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 2ms, Maximum = 15ms, Average = 5ms

C:\>**ping 192.168.4.2**

Pinging 192.168.4.2 with 32 bytes of data:

Reply from 192.168.4.2: bytes=32 time=3ms TTL=125

Reply from 192.168.4.2: bytes=32 time=4ms TTL=125

Reply from 192.168.4.2: bytes=32 time=9ms TTL=125

Reply from 192.168.4.2: bytes=32 time=4ms TTL=125

Ping statistics for 192.168.4.2:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 3ms, Maximum = 9ms, Average = 5ms

**PC3**

C:\>ping **192.168.1.2**

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=2ms TTL=125

Reply from 192.168.1.2: bytes=32 time=4ms TTL=125

Reply from 192.168.1.2: bytes=32 time=2ms TTL=125

Reply from 192.168.1.2: bytes=32 time=11ms TTL=125

Ping statistics for 192.168.1.2:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 2ms, Maximum = 11ms, Average = 4ms

C:\>**ping 192.168.2.2**

Pinging 192.168.2.2 with 32 bytes of data:

Reply from 192.168.2.2: bytes=32 time=2ms TTL=126

Reply from 192.168.2.2: bytes=32 time=1ms TTL=126

Reply from 192.168.2.2: bytes=32 time=1ms TTL=126

Reply from 192.168.2.2: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.2.2:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 1ms, Maximum = 2ms, Average = 1ms

C:\>**ping 192.168.4.2**

Pinging 192.168.4.2 with 32 bytes of data:

Reply from 192.168.4.2: bytes=32 time=12ms TTL=126

Reply from 192.168.4.2: bytes=32 time=1ms TTL=126

Reply from 192.168.4.2: bytes=32 time=1ms TTL=126

Reply from 192.168.4.2: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.4.2:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 1ms, Maximum = 12ms, Average = 3ms

**PC4**

C:\>**ping 192.168.1.2**

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=3ms TTL=124

Reply from 192.168.1.2: bytes=32 time=9ms TTL=124

Reply from 192.168.1.2: bytes=32 time=3ms TTL=124

Reply from 192.168.1.2: bytes=32 time=53ms TTL=124

Ping statistics for 192.168.1.2:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 3ms, Maximum = 53ms, Average = 17ms

C:\>**ping 192.168.2.2**

Pinging 192.168.2.2 with 32 bytes of data:

Reply from 192.168.2.2: bytes=32 time=3ms TTL=125

Reply from 192.168.2.2: bytes=32 time=4ms TTL=125

Reply from 192.168.2.2: bytes=32 time=4ms TTL=125

Reply from 192.168.2.2: bytes=32 time=8ms TTL=125

Ping statistics for 192.168.2.2:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 3ms, Maximum = 8ms, Average = 4ms

C:\>**ping 192.168.3.2**

Pinging 192.168.3.2 with 32 bytes of data:

Reply from 192.168.3.2: bytes=32 time=2ms TTL=126

Reply from 192.168.3.2: bytes=32 time=1ms TTL=126

Reply from 192.168.3.2: bytes=32 time=1ms TTL=126

Reply from 192.168.3.2: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.3.2:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 1ms, Maximum = 2ms, Average = 1ms

**Router 1**

R1#**show run**

hostname R1

interface GigabitEthernet0/0/0

ip address 192.168.1.1 255.255.255.0

duplex auto

speed auto

interface GigabitEthernet0/0/1

no ip address

duplex auto

speed auto

shutdown

interface Serial0/1/0

ip address 192.168.5.1 255.255.255.252

clock rate 2000000

interface Serial0/1/1

no ip address

clock rate 2000000

shutdown

router ospf 1

router-id 1.1.1.1

log-adjacency-changes

network 192.168.1.0 0.0.0.255 area 0

network 192.168.5.0 0.0.0.3 area 0

end

R1#**show ip route**

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, E - EGP

i - IS-IS, 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

Gateway of last resort is not set

192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks

C 192.168.1.0/24 is directly connected, GigabitEthernet0/0/0

L 192.168.1.1/32 is directly connected, GigabitEthernet0/0/0

O 192.168.2.0/24 [110/65] via 192.168.5.2, 00:50:16, Serial0/1/0

O 192.168.3.0/24 [110/129] via 192.168.5.2, 00:50:06, Serial0/1/0

O 192.168.4.0/24 [110/193] via 192.168.5.2, 00:50:06, Serial0/1/0

192.168.5.0/24 is variably subnetted, 4 subnets, 2 masks

C 192.168.5.0/30 is directly connected, Serial0/1/0

L 192.168.5.1/32 is directly connected, Serial0/1/0

O 192.168.5.4/30 [110/128] via 192.168.5.2, 00:50:16, Serial0/1/0

O 192.168.5.8/30 [110/192] via 192.168.5.2, 00:50:06, Serial0/1/0

R1#**show ip protocol**

Routing Protocol is "ospf 1"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 1.1.1.1

Number of areas in this router is 1. 1 normal 0 stub 0 nssa

Maximum path: 4

Routing for Networks:

192.168.1.0 0.0.0.255 area 0

192.168.5.0 0.0.0.3 area 0

Routing Information Sources:

Gateway Distance Last Update

1.1.1.1 110 00:20:14

2.2.2.2 110 00:20:16

3.3.3.3 110 00:20:15

4.4.4.4 110 00:20:15

Distance: (default is 110)

R1#**show ip ospf neighbor**

Neighbor ID Pri State Dead Time Address Interface

2.2.2.2 0 FULL/ - 00:00:38 192.168.5.2 Serial0/1/0

R1#**show ip ospf interface**

GigabitEthernet0/0/0 is up, line protocol is up

Internet address is 192.168.1.1/24, Area 0

Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State DR, Priority 1

Designated Router (ID) 1.1.1.1, Interface address 192.168.1.1

No backup designated router on this network

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

Hello due in 00:00:09

Index 1/1, flood queue length 0

Next 0x0(0)/0x0(0)

Last flood scan length is 1, maximum is 1

Last flood scan time is 0 msec, maximum is 0 msec

Neighbor Count is 0, Adjacent neighbor count is 0

Suppress hello for 0 neighbor(s)

Serial0/1/0 is up, line protocol is up

Internet address is 192.168.5.1/30, Area 0

Process ID 1, Router ID 1.1.1.1, Network Type POINT-TO-POINT, Cost: 64

Transmit Delay is 1 sec, State POINT-TO-POINT,

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

Hello due in 00:00:00

Index 2/2, flood queue length 0

Next 0x0(0)/0x0(0)

Last flood scan length is 1, maximum is 1

Last flood scan time is 0 msec, maximum is 0 msec

Neighbor Count is 1 , Adjacent neighbor count is 1

Adjacent with neighbor 2.2.2.2

Suppress hello for 0 neighbor(s)

**Router 2**

R2#**show run**

hostname R2

interface GigabitEthernet0/0/0

ip address 192.168.2.1 255.255.255.0

duplex auto

speed auto

interface GigabitEthernet0/0/1

no ip address

duplex auto

speed auto

shutdown

interface Serial0/1/0

ip address 192.168.5.2 255.255.255.252

interface Serial0/1/1

ip address 192.168.5.5 255.255.255.252

clock rate 2000000

router ospf 2

router-id 2.2.2.2

log-adjacency-changes

network 192.168.2.0 0.0.0.255 area 0

network 192.168.5.0 0.0.0.3 area 0

network 192.168.5.4 0.0.0.3 area 0

end

R2#**show ip route**

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, E - EGP

i - IS-IS, 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

Gateway of last resort is not set

O 192.168.1.0/24 [110/65] via 192.168.5.1, 00:52:34, Serial0/1/0

192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks

C 192.168.2.0/24 is directly connected, GigabitEthernet0/0/0

L 192.168.2.1/32 is directly connected, GigabitEthernet0/0/0

O 192.168.3.0/24 [110/65] via 192.168.5.5, 00:52:34, Serial0/1/1

O 192.168.4.0/24 [110/129] via 192.168.5.5, 00:52:24, Serial0/1/1

192.168.5.0/24 is variably subnetted, 5 subnets, 2 masks

C 192.168.5.0/30 is directly connected, Serial0/1/0

L 192.168.5.2/32 is directly connected, Serial0/1/0

C 192.168.5.4/30 is directly connected, Serial0/1/1

L 192.168.5.5/32 is directly connected, Serial0/1/1

O 192.168.5.8/30 [110/128] via 192.168.5.5, 00:52:34, Serial0/1/1

R2#**show ip protocol**

Routing Protocol is "ospf 2"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 2.2.2.2

Number of areas in this router is 1. 1 normal 0 stub 0 nssa

Maximum path: 4

Routing for Networks:

192.168.2.0 0.0.0.255 area 0

192.168.5.0 0.0.0.3 area 0

192.168.5.4 0.0.0.3 area 0

Routing Information Sources:

Gateway Distance Last Update

1.1.1.1 110 00:22:29

2.2.2.2 110 00:22:31

3.3.3.3 110 00:22:30

4.4.4.4 110 00:22:30

Distance: (default is 110)

R2#**show ip ospf neighbor**

Neighbor ID Pri State Dead Time Address Interface

1.1.1.1 0 FULL/ - 00:00:32 192.168.5.1 Serial0/1/0

3.3.3.3 0 FULL/ - 00:00:39 192.168.5.5 Serial0/1/1

R2#**show ip ospf interface**

GigabitEthernet0/0/0 is up, line protocol is up

Internet address is 192.168.2.1/24, Area 0

Process ID 2, Router ID 2.2.2.2, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State DR, Priority 1

Designated Router (ID) 2.2.2.2, Interface address 192.168.2.1

No backup designated router on this network

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

Hello due in 00:00:07

Index 1/1, flood queue length 0

Next 0x0(0)/0x0(0)

Last flood scan length is 1, maximum is 1

Last flood scan time is 0 msec, maximum is 0 msec

Neighbor Count is 0, Adjacent neighbor count is 0

Suppress hello for 0 neighbor(s)

Serial0/1/1 is up, line protocol is up

Internet address is 192.168.5.5/30, Area 0

Process ID 2, Router ID 2.2.2.2, Network Type POINT-TO-POINT, Cost: 64

Transmit Delay is 1 sec, State POINT-TO-POINT,

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

Hello due in 00:00:06

Index 2/2, flood queue length 0

Next 0x0(0)/0x0(0)

Last flood scan length is 1, maximum is 1

Last flood scan time is 0 msec, maximum is 0 msec

Neighbor Count is 1 , Adjacent neighbor count is 1

Adjacent with neighbor 3.3.3.3

Suppress hello for 0 neighbor(s)

Serial0/1/0 is up, line protocol is up

Internet address is 192.168.5.2/30, Area 0

Process ID 2, Router ID 2.2.2.2, Network Type POINT-TO-POINT, Cost: 64

Transmit Delay is 1 sec, State POINT-TO-POINT,

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

Hello due in 00:00:06

Index 3/3, flood queue length 0

Next 0x0(0)/0x0(0)

Last flood scan length is 1, maximum is 1

Last flood scan time is 0 msec, maximum is 0 msec

Neighbor Count is 1 , Adjacent neighbor count is 1

Adjacent with neighbor 1.1.1.1

Suppress hello for 0 neighbor(s)

**Router 3**

R3#**show run**

hostname R3

interface GigabitEthernet0/0/0

ip address 192.168.3.1 255.255.255.0

duplex auto

speed auto

interface GigabitEthernet0/0/1

no ip address

duplex auto

speed auto

shutdown

interface Serial0/1/0

ip address 192.168.5.9 255.255.255.252

clock rate 2000000

interface Serial0/1/1

ip address 192.168.5.5 255.255.255.252

router ospf 3

router-id 3.3.3.3

log-adjacency-changes

network 192.168.3.0 0.0.0.255 area 0

network 192.168.5.4 0.0.0.3 area 0

network 192.168.5.8 0.0.0.3 area 0

end

R3#**show ip route**

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, E - EGP

i - IS-IS, 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

Gateway of last resort is not set

O 192.168.1.0/24 [110/129] via 192.168.5.5, 00:46:46, Serial0/1/1

O 192.168.2.0/24 [110/65] via 192.168.5.5, 00:46:46, Serial0/1/1

192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks

C 192.168.3.0/24 is directly connected, GigabitEthernet0/0/0

L 192.168.3.1/32 is directly connected, GigabitEthernet0/0/0

O 192.168.4.0/24 [110/65] via 192.168.5.10, 00:46:46, Serial0/1/0

192.168.5.0/24 is variably subnetted, 5 subnets, 2 masks

O 192.168.5.0/30 [110/128] via 192.168.5.5, 00:46:46, Serial0/1/1

C 192.168.5.4/30 is directly connected, Serial0/1/1

L 192.168.5.5/32 is directly connected, Serial0/1/1

C 192.168.5.8/30 is directly connected, Serial0/1/0

L 192.168.5.9/32 is directly connected, Serial0/1/0

R3#**show ip protocol**

Routing Protocol is "ospf 3"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 3.3.3.3

Number of areas in this router is 1. 1 normal 0 stub 0 nssa

Maximum path: 4

Routing for Networks:

192.168.3.0 0.0.0.255 area 0

192.168.5.4 0.0.0.3 area 0

192.168.5.8 0.0.0.3 area 0

Routing Information Sources:

Gateway Distance Last Update

1.1.1.1 110 00:16:46

2.2.2.2 110 00:16:49

3.3.3.3 110 00:16:47

4.4.4.4 110 00:16:48

Distance: (default is 110)

R3#**show ip ospf neighbor**

Neighbor ID Pri State Dead Time Address Interface

4.4.4.4 0 FULL/ - 00:00:38 192.168.5.10 Serial0/1/0

2.2.2.2 0 FULL/ - 00:00:32 192.168.5.5 Serial0/1/1

R3#**show ip ospf interface**

GigabitEthernet0/0/0 is up, line protocol is up

Internet address is 192.168.3.1/24, Area 0

Process ID 3, Router ID 3.3.3.3, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State DR, Priority 1

Designated Router (ID) 3.3.3.3, Interface address 192.168.3.1

No backup designated router on this network

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

Hello due in 00:00:07

Index 1/1, flood queue length 0

Next 0x0(0)/0x0(0)

Last flood scan length is 1, maximum is 1

Last flood scan time is 0 msec, maximum is 0 msec

Neighbor Count is 0, Adjacent neighbor count is 0

Suppress hello for 0 neighbor(s)

Serial0/1/0 is up, line protocol is up

Internet address is 192.168.5.9/30, Area 0

Process ID 3, Router ID 3.3.3.3, Network Type POINT-TO-POINT, Cost: 64

Transmit Delay is 1 sec, State POINT-TO-POINT,

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

Hello due in 00:00:07

Index 2/2, flood queue length 0

Next 0x0(0)/0x0(0)

Last flood scan length is 1, maximum is 1

Last flood scan time is 0 msec, maximum is 0 msec

Neighbor Count is 1 , Adjacent neighbor count is 1

Adjacent with neighbor 4.4.4.4

Suppress hello for 0 neighbor(s)

Serial0/1/1 is up, line protocol is up

Internet address is 192.168.5.5/30, Area 0

Process ID 3, Router ID 3.3.3.3, Network Type POINT-TO-POINT, Cost: 64

Transmit Delay is 1 sec, State POINT-TO-POINT,

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

Hello due in 00:00:05

Index 3/3, flood queue length 0

Next 0x0(0)/0x0(0)

Last flood scan length is 1, maximum is 1

Last flood scan time is 0 msec, maximum is 0 msec

Neighbor Count is 1 , Adjacent neighbor count is 1

Adjacent with neighbor 2.2.2.2

Suppress hello for 0 neighbor(s)

**Router 4**

R4#**show run**

hostname R4

interface GigabitEthernet0/0/0

ip address 192.168.4.1 255.255.255.0

duplex auto

speed auto

interface GigabitEthernet0/0/1

no ip address

duplex auto

speed auto

shutdown

interface Serial0/1/0

ip address 192.168.5.10 255.255.255.252

interface Serial0/1/1

no ip address

clock rate 2000000

shutdown

router ospf 4

router-id 4.4.4.4

log-adjacency-changes

network 192.168.4.0 0.0.0.255 area 0

network 192.168.5.8 0.0.0.3 area 0

end

R4#**show ip route**

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, E - EGP

i - IS-IS, 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

Gateway of last resort is not set

O 192.168.1.0/24 [110/193] via 192.168.5.9, 00:54:50, Serial0/1/0

O 192.168.2.0/24 [110/129] via 192.168.5.9, 00:54:50, Serial0/1/0

O 192.168.3.0/24 [110/65] via 192.168.5.9, 00:54:50, Serial0/1/0

192.168.4.0/24 is variably subnetted, 2 subnets, 2 masks

C 192.168.4.0/24 is directly connected, GigabitEthernet0/0/0

L 192.168.4.1/32 is directly connected, GigabitEthernet0/0/0

192.168.5.0/24 is variably subnetted, 4 subnets, 2 masks

O 192.168.5.0/30 [110/192] via 192.168.5.9, 00:54:50, Serial0/1/0

O 192.168.5.4/30 [110/128] via 192.168.5.9, 00:54:50, Serial0/1/0

C 192.168.5.8/30 is directly connected, Serial0/1/0

L 192.168.5.10/32 is directly connected, Serial0/1/0

R4#**show ip proto**

Routing Protocol is "ospf 4"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 4.4.4.4

Number of areas in this router is 1. 1 normal 0 stub 0 nssa

Maximum path: 4

Routing for Networks:

192.168.4.0 0.0.0.255 area 0

192.168.5.8 0.0.0.3 area 0

Routing Information Sources:

Gateway Distance Last Update

1.1.1.1 110 00:24:49

2.2.2.2 110 00:24:51

3.3.3.3 110 00:24:50

4.4.4.4 110 00:24:50

Distance: (default is 110)

R4#**show ip ospf neighbor**

Neighbor ID Pri State Dead Time Address Interface

3.3.3.3 0 FULL/ - 00:00:30 192.168.5.9 Serial0/1/0

R4#**show ip ospf interface**

GigabitEthernet0/0/0 is up, line protocol is up

Internet address is 192.168.4.1/24, Area 0

Process ID 4, Router ID 4.4.4.4, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State DR, Priority 1

Designated Router (ID) 4.4.4.4, Interface address 192.168.4.1

No backup designated router on this network

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

Hello due in 00:00:03

Index 1/1, flood queue length 0

Next 0x0(0)/0x0(0)

Last flood scan length is 1, maximum is 1

Last flood scan time is 0 msec, maximum is 0 msec

Neighbor Count is 0, Adjacent neighbor count is 0

Suppress hello for 0 neighbor(s)

Serial0/1/0 is up, line protocol is up

Internet address is 192.168.5.10/30, Area 0

Process ID 4, Router ID 4.4.4.4, Network Type POINT-TO-POINT, Cost: 64

Transmit Delay is 1 sec, State POINT-TO-POINT,

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

Hello due in 00:00:09

Index 2/2, flood queue length 0

Next 0x0(0)/0x0(0)

Last flood scan length is 1, maximum is 1

Last flood scan time is 0 msec, maximum is 0 msec

Neighbor Count is 1 , Adjacent neighbor count is 1

Adjacent with neighbor 3.3.3.3

Suppress hello for 0 neighbor(s)

Problems

One problem that came up was the struggle of remembering how to do cisco, with the code and topology set up. The way I resolved this issue was going back into the previous year’s OneNote and did a rough scan over the parts like ospfv2, network statements, setting up router and PC ipv4 addresses. Another issue that popped up during set up was the valid ipv4 addresses that could be used with the correct subnet mask like with /30 it would have 4 addresses but could only use 2 of them because network and broadcast addresses. And again, I resolved it by looking back at the OneNote looking at the Wickstrom Table of the groups of ipv4 addresses that could be used.

Conclusion

The lab was a good review for the starting school year, since over the summer I didn’t have Cisco on my mind. I remembered how to set up a single area OSFP in ipv4, revisiting past CCNA OneNote on commands, and creating the topology in Packet Tracer with my choice of ipv4 addresses and subnet masks verse being given a lab paper with the premade addresses. Overall, a considerable lab for us to get familiarize ourselves into Cisco with new concepts to learn in CCNP.