Stubby, Not So Stubby, and Totally Stubby Area

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Purpose

The purpose of this lab was to configure OSPFv2 with configurations of stubby area, totally stubby area, NSSA, and EIGRP on eight networks. In this lab our goal was to setup the LSA packets in the areas and understand how it plays a role in defining the area types. Overall, in this lab, I learned how to setup all area types as well as EIGRP and the role each area type plays.

Background Information

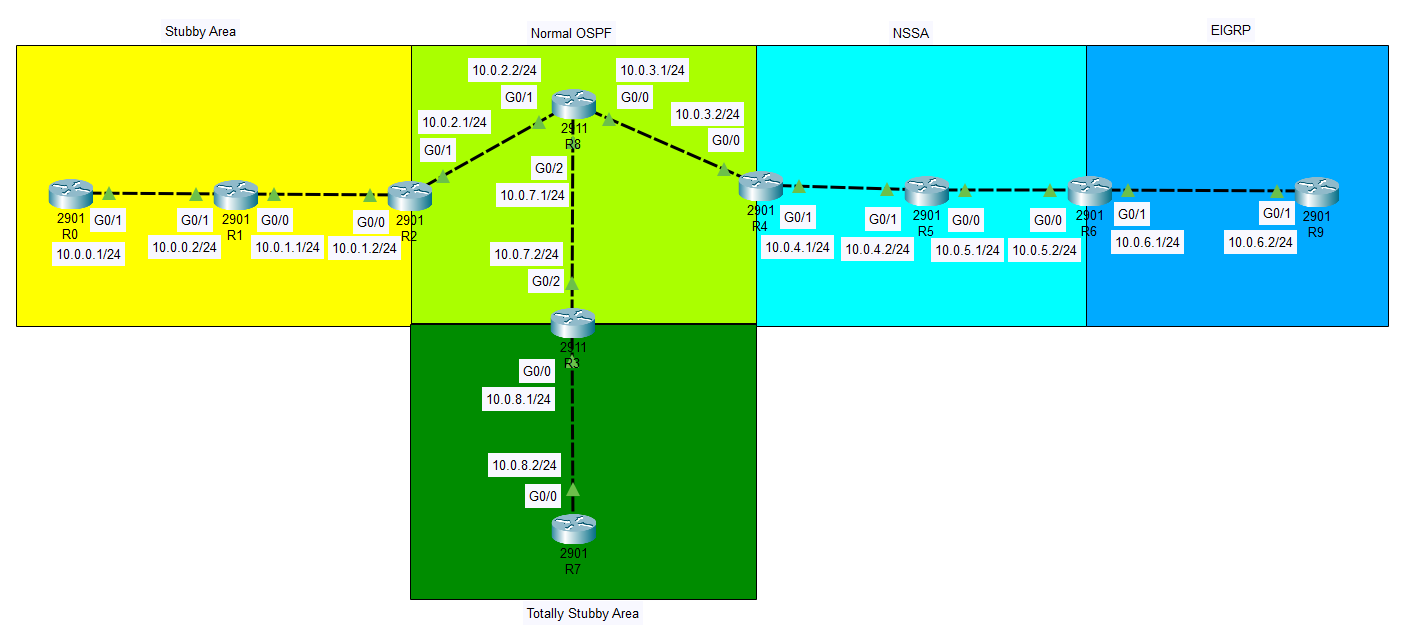
OSPF is a commonly used IGP which is used in a wide range of situations and it uses an algorithm to determine the shortest path to the destination network address. OSPF relies on several types of Link State Advertisements (LSA’s) to communicate link state information between neighbors. OSPF uses LSDB (link state database) and fills this with LSAs. LSA’s have different types from 1 through 7. OSPF has special area types called stub areas, totally, stubby areas and NSSA (not so stubby area). The special area types are used to insert default routes into an area and replace type 3 summary LSAs and type 5 external LSAs. OSPF advertises prefixes from other areas, and prefixes that are redistributed into OSPF, is different from the way OSPF advertises prefixes from within the areas your router is. This way involves using different types of Link State Advertisement. The type of address being advertised will fall into one of the LSA types based on its role place in the network. Overall, standard areas can contain LSAs of type of 1,2,3,4 and 5 and may contain an ASBR. Stub areas contain type 1,2, and 3 LSAs and a default route is substituted for external routes. Totally stubby areas can only contain type 1 and 2 LSAs and a single type 3 LSA which describes a default route substituted for all external and inter-area routes. Not so stubby areas implement stub or totally stubby functionality yet contain an ASBR. Type 7 LSAs generated by the ABRs to be flooded to the rest of OSPF domain. To conclude OSPF allows collections of multiple networks and hosts to be grouped together and stub areas blocks certain types of LSA from entering the area.

Lab Summary

In packet tracer, I setup a local area topology which includes 10 routers in 4 different area types as well as EIGRP and in total there are eight networks. There are four area border routers. In this lab I setup OSPFv2 on each network and the different area networks for certain ports and routers. Overall, by the end of the lab, I was able to ping each network with OSPFv2, EIGRP, and area types setup on the routers.

Lab Commands

* Router OSPF: Indicates the beginning of the OSPF configuration on the router
* Router-id: Assigns the router an OSPF ID to advertise to neighbor networks
* Network area: Advertise the interfaces whose addresses fill in the specified network command
* Show ip ospf interface: Displays the OSPF configuration for the certain interface
* Show ip route: Displays the IPv4 configurations and routes between the interfaces and routers
* Show ip route ospf: Displays the routes from OSPF
* Interface: Allows you to configure a particular interface
* Router eigrp:
* Show ip eigrp neighbor: Displays the EIGRP neighbors
* Show ip eigrp interface: Displays the EIGRP configurations

Network Diagram with IP’s

Routing Table

|  |  |  |  |
| --- | --- | --- | --- |
| Device | Port | IPv4 Address | Subnet Mask |
| R0 | G0/1 | 10.0.0.1 | 255.255.255.0 |
| R1 | G0/1 | 10.0.0.2 | 255.255.255.0 |
| R1 | G0/0 | 10.0.1.1 | 255.255.255.0 |
| R2 | G0/0 | 10.0.1.2 | 255.255.255.0 |
| R2 | G0/1 | 10.0.2.1 | 255.255.255.0 |
| R3 | G0/2 | 10.0.7.2 | 255.255.255.0 |
| R3 | G0/0 | 10.0.8.1 | 255.255.255.0 |
| R4 | G0/0 | 10.0.3.2 | 255.255.255.0 |
| R4 | G0/1 | 10.0.4.1 | 255.255.255.0 |
| R5 | G0/1 | 10.0.4.2 | 255.255.255.0 |
| R5 | G0/0 | 10.0.5.1 | 255.255.255.0 |
| R6 | G0/0 | 10.0.5.2 | 255.255.255.0 |
| R6 | G0/1 | 10.0.6.1 | 255.255.255.0 |
| R7 | G0/0 | 10.0.8.2 | 255.255.255.0 |
| R8 | G0/0 | 10.0.2.2 | 255.255.255.0 |
| R8 | G0/2 | 10.0.7.1 | 255.255.255.0 |
| R9 | G0/1 | 10.0.6.2 | 255.255.255.0 |

Configurations

Router 0

Show run

interface GigabitEthernet0/0

no ip address

duplex auto

speed auto

shutdown

interface GigabitEthernet0/1

ip address 10.0.0.1 255.255.255.0

duplex auto

speed auto

interface Vlan1

no ip address

shutdown

router ospf 10

log-adjacency-changes

area 1 stub

network 10.0.0.0 0.0.0.255 area 1

Show ip ospf interface

GigabitEthernet0/1 is up, line protocol is up

Internet address is 10.0.0.1/24, Area 1

Process ID 10, Router ID 10.0.0.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State BDR, Priority 1

Designated Router (ID) 10.0.1.1, Interface address 10.0.0.2

Backup Designated Router (ID) 10.0.0.1, Interface address 10.0.0.1

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 1, Adjacent neighbor count is 1

Adjacent with neighbor 10.0.1.1 (Designated Router)

Suppress hello for 0 neighbor(s)

Show ip ospf neighbor

Neighbor ID Pri State Dead Time Address Interface

10.0.1.1 1 FULL/DR 00:00:37 10.0.0.2 GigabitEthernet0/1

Show ip protocols

Routing Protocol is "ospf 10"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 10.0.0.1

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

Maximum path: 4

Routing for Networks:

10.0.0.0 0.0.0.255 area 1

Routing Information Sources:

Gateway Distance Last Update

10.0.0.1 110 00:00:03

10.0.1.1 110 00:00:07

10.0.2.1 110 00:00:04

Distance: (default is 110)

Show ip route eigrp

10.0.0.0/8 is variably subnetted, 9 subnets, 2 masks

Router 1

Show run

interface GigabitEthernet0/0

ip address 10.0.1.1 255.255.255.0

duplex auto

speed auto

interface GigabitEthernet0/1

ip address 10.0.0.2 255.255.255.0

duplex auto

speed auto

interface Vlan1

no ip address

shutdown

router ospf 10

log-adjacency-changes

area 1 stub

network 10.0.0.0 0.0.0.255 area 1

network 10.0.1.0 0.0.0.255 area 1

Show ip ospf interface

GigabitEthernet0/0 is up, line protocol is up

Internet address is 10.0.1.1/24, Area 1

Process ID 10, Router ID 10.0.1.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State BDR, Priority 1

Designated Router (ID) 10.0.2.1, Interface address 10.0.1.2

Backup Designated Router (ID) 10.0.1.1, Interface address 10.0.1.1

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

Hello due in 00:00:01

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 1, Adjacent neighbor count is 1

Adjacent with neighbor 10.0.2.1 (Designated Router)

Suppress hello for 0 neighbor(s)

GigabitEthernet0/1 is up, line protocol is up

Internet address is 10.0.0.2/24, Area 1

Process ID 10, Router ID 10.0.1.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State DR, Priority 1

Designated Router (ID) 10.0.1.1, Interface address 10.0.0.2

Backup Designated Router (ID) 10.0.0.1, Interface address 10.0.0.1

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

Hello due in 00:00:01

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 10.0.0.1 (Backup Designated Router)

Suppress hello for 0 neighbor(s)

Show ip ospf neighbor

Neighbor ID Pri State Dead Time Address Interface

10.0.2.1 1 FULL/DR 00:00:39 10.0.1.2 GigabitEthernet0/0

10.0.0.1 1 FULL/BDR 00:00:37 10.0.0.1 GigabitEthernet0/1

Show ip protocols

Routing Protocol is "ospf 10"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 10.0.1.1

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

Maximum path: 4

Routing for Networks:

10.0.0.0 0.0.0.255 area 1

10.0.1.0 0.0.0.255 area 1

Routing Information Sources:

Gateway Distance Last Update

10.0.0.1 110 00:11:27

10.0.1.1 110 00:11:30

10.0.2.1 110 00:11:28

Distance: (default is 110)

Show ip route eigrp

10.0.0.0/8 is variably subnetted, 10 subnets, 2 masks

Router 2

Show run

interface GigabitEthernet0/0

ip address 10.0.1.2 255.255.255.0

duplex auto

speed auto

interface GigabitEthernet0/1

ip address 10.0.2.1 255.255.255.0

duplex auto

speed auto

interface Vlan1

no ip address

shutdown

router ospf 10

log-adjacency-changes

area 1 stub

network 10.0.1.0 0.0.0.255 area 1

network 10.0.2.0 0.0.0.255 area 0

Show ip ospf interface

GigabitEthernet0/0 is up, line protocol is up

Internet address is 10.0.1.2/24, Area 1

Process ID 10, Router ID 10.0.2.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State DR, Priority 1

Designated Router (ID) 10.0.2.1, Interface address 10.0.1.2

Backup Designated Router (ID) 10.0.1.1, Interface address 10.0.1.1

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 1, Adjacent neighbor count is 1

Adjacent with neighbor 10.0.1.1 (Backup Designated Router)

Suppress hello for 0 neighbor(s)

GigabitEthernet0/1 is up, line protocol is up

Internet address is 10.0.2.1/24, Area 0

Process ID 10, Router ID 10.0.2.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State BDR, Priority 1

Designated Router (ID) 10.0.7.1, Interface address 10.0.2.2

Backup Designated Router (ID) 10.0.2.1, Interface address 10.0.2.1

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 10.0.7.1 (Designated Router)

Suppress hello for 0 neighbor(s)

Show ip ospf neighbor

Neighbor ID Pri State Dead Time Address Interface

10.0.1.1 1 FULL/BDR 00:00:36 10.0.1.1 GigabitEthernet0/0

10.0.7.1 1 FULL/DR 00:00:36 10.0.2.2 GigabitEthernet0/1

Show ip ospf protocols

Routing Protocol is "ospf 10"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 10.0.2.1

Number of areas in this router is 2. 1 normal 1 stub 0 nssa

Maximum path: 4

Routing for Networks:

10.0.1.0 0.0.0.255 area 1

10.0.2.0 0.0.0.255 area 0

Routing Information Sources:

Gateway Distance Last Update

10.0.0.1 110 00:14:53

10.0.1.1 110 00:14:59

10.0.2.1 110 00:14:59

10.0.4.1 110 00:14:56

10.0.7.1 110 00:14:55

10.0.8.1 110 00:14:54

Distance: (default is 110)

Router 3

Show run

interface GigabitEthernet0/0

ip address 10.0.8.1 255.255.255.0

duplex auto

speed auto

interface GigabitEthernet0/1

no ip address

duplex auto

speed auto

shutdown

interface GigabitEthernet0/2

ip address 10.0.7.2 255.255.255.0

duplex auto

speed auto

interface Vlan1

no ip address

shutdown

router ospf 10

log-adjacency-changes

area 20 stub no-summary

network 10.0.7.0 0.0.0.255 area 0

network 10.0.8.0 0.0.0.255 area 2

Show ip ospf interface

GigabitEthernet0/2 is up, line protocol is up

Internet address is 10.0.7.2/24, Area 0

Process ID 10, Router ID 10.0.8.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State DR, Priority 1

Designated Router (ID) 10.0.8.1, Interface address 10.0.7.2

Backup Designated Router (ID) 10.0.7.1, Interface address 10.0.7.1

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

Hello due in 00:00:04

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 1, Adjacent neighbor count is 1

Adjacent with neighbor 10.0.7.1 (Backup Designated Router)

Suppress hello for 0 neighbor(s)

GigabitEthernet0/0 is up, line protocol is up

Internet address is 10.0.8.1/24, Area 2

Process ID 10, Router ID 10.0.8.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State BDR, Priority 1

Designated Router (ID) 10.0.8.2, Interface address 10.0.8.2

Backup Designated Router (ID) 10.0.8.1, Interface address 10.0.8.1

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

Hello due in 00:00:04

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 10.0.8.2 (Designated Router)

Suppress hello for 0 neighbor(s)

Show ip ospf neighbor

Neighbor ID Pri State Dead Time Address Interface

10.0.7.1 1 FULL/BDR 00:00:39 10.0.7.1 GigabitEthernet0/2

10.0.8.2 1 FULL/DR 00:00:30 10.0.8.2 GigabitEthernet0/0

Show ip protocols

Routing Protocol is "ospf 10"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 10.0.8.1

Number of areas in this router is 3. 2 normal 1 stub 0 nssa

Maximum path: 4

Routing for Networks:

10.0.7.0 0.0.0.255 area 0

10.0.8.0 0.0.0.255 area 2

Routing Information Sources:

Gateway Distance Last Update

10.0.2.1 110 00:20:36

10.0.4.1 110 00:20:33

10.0.7.1 110 00:20:31

10.0.8.1 110 00:20:34

10.0.8.2 110 00:20:35

Distance: (default is 110)

Router 4

Show run

interface GigabitEthernet0/0

ip address 10.0.3.2 255.255.255.0

duplex auto

speed auto

interface GigabitEthernet0/1

ip address 10.0.4.1 255.255.255.0

duplex auto

speed auto

interface Vlan1

no ip address

shutdown

router ospf 10

log-adjacency-changes

area 1 nssa

network 10.0.4.0 0.0.0.255 area 1

network 10.0.3.0 0.0.0.255 area 0

Show ip ospf interface

GigabitEthernet0/1 is up, line protocol is up

Internet address is 10.0.4.1/24, Area 1

Process ID 10, Router ID 10.0.4.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State BDR, Priority 1

Designated Router (ID) 10.0.5.1, Interface address 10.0.4.2

Backup Designated Router (ID) 10.0.4.1, Interface address 10.0.4.1

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 1, Adjacent neighbor count is 1

Adjacent with neighbor 10.0.5.1 (Designated Router)

Suppress hello for 0 neighbor(s)

GigabitEthernet0/0 is up, line protocol is up

Internet address is 10.0.3.2/24, Area 0

Process ID 10, Router ID 10.0.4.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State BDR, Priority 1

Designated Router (ID) 10.0.7.1, Interface address 10.0.3.1

Backup Designated Router (ID) 10.0.4.1, Interface address 10.0.3.2

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 10.0.7.1 (Designated Router)

Suppress hello for 0 neighbor(s)

Show ip ospf neighbor

Neighbor ID Pri State Dead Time Address Interface

10.0.5.1 1 FULL/DR 00:00:39 10.0.4.2 GigabitEthernet0/1

10.0.7.1 1 FULL/DR 00:00:39 10.0.3.1 GigabitEthernet0/0

Show ip protocols

Routing Protocol is "ospf 10"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 10.0.4.1

It is an autonomous system boundary router

Redistributing External Routes from,

Number of areas in this router is 2. 1 normal 0 stub 1 nssa

Maximum path: 4

Routing for Networks:

10.0.4.0 0.0.0.255 area 1

10.0.3.0 0.0.0.255 area 0

Routing Information Sources:

Gateway Distance Last Update

10.0.2.1 110 00:13:34

10.0.4.1 110 00:13:39

10.0.5.1 110 00:13:34

10.0.6.1 110 00:13:34

10.0.7.1 110 00:13:34

10.0.8.1 110 00:13:39

Distance: (default is 110)

Router 5

Show run

interface GigabitEthernet0/0

ip address 10.0.5.1 255.255.255.0

duplex auto

speed auto

interface GigabitEthernet0/1

ip address 10.0.4.2 255.255.255.0

duplex auto

speed auto

interface Vlan1

no ip address

shutdown

router ospf 10

log-adjacency-changes

area 1 nssa

network 10.0.5.0 0.0.0.255 area 1

network 10.0.4.0 0.0.0.255 area 1

Show ip ospf interface

GigabitEthernet0/1 is up, line protocol is up

Internet address is 10.0.4.2/24, Area 1

Process ID 10, Router ID 10.0.5.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State DR, Priority 1

Designated Router (ID) 10.0.5.1, Interface address 10.0.4.2

Backup Designated Router (ID) 10.0.4.1, Interface address 10.0.4.1

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

Hello due in 00:00:01

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 1, Adjacent neighbor count is 1

Adjacent with neighbor 10.0.4.1 (Backup Designated Router)

Suppress hello for 0 neighbor(s)

GigabitEthernet0/0 is up, line protocol is up

Internet address is 10.0.5.1/24, Area 1

Process ID 10, Router ID 10.0.5.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State BDR, Priority 1

Designated Router (ID) 10.0.6.1, Interface address 10.0.5.2

Backup Designated Router (ID) 10.0.5.1, Interface address 10.0.5.1

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

Hello due in 00:00:01

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 10.0.6.1 (Designated Router)

Suppress hello for 0 neighbor(s)

Show ip ospf neighbor

Neighbor ID Pri State Dead Time Address Interface

10.0.6.1 1 FULL/DR 00:00:37 10.0.5.2 GigabitEthernet0/0

10.0.4.1 1 FULL/BDR 00:00:38 10.0.4.1 GigabitEthernet0/1

Show ip protocols

Routing Protocol is "ospf 10"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 10.0.5.1

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

Maximum path: 4

Routing for Networks:

10.0.5.0 0.0.0.255 area 1

10.0.4.0 0.0.0.255 area 1

Routing Information Sources:

Gateway Distance Last Update

10.0.4.1 110 00:29:01

10.0.5.1 110 00:28:56

10.0.6.1 110 00:28:56

Distance: (default is 110)

Router 6

Show run

interface GigabitEthernet0/0

ip address 10.0.5.2 255.255.255.0

duplex auto

speed auto

interface GigabitEthernet0/1

ip address 10.0.6.1 255.255.255.0

duplex auto

speed auto

interface Vlan1

no ip address

shutdown

router eigrp 10

redistribute ospf 10

redistribute connected

network 10.0.6.0 0.0.0.255

router ospf 10

log-adjacency-changes

area 1 nssa

redistribute eigrp 10 subnets

network 10.0.5.0 0.0.0.255 area 1

Show ip ospf interface

GigabitEthernet0/0 is up, line protocol is up

Internet address is 10.0.5.2/24, Area 1

Process ID 10, Router ID 10.0.6.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State DR, Priority 1

Designated Router (ID) 10.0.6.1, Interface address 10.0.5.2

Backup Designated Router (ID) 10.0.5.1, Interface address 10.0.5.1

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

Hello due in 00:00:01

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 1, Adjacent neighbor count is 1

Adjacent with neighbor 10.0.5.1 (Backup Designated Router)

Suppress hello for 0 neighbor(s)

Show ip ospf neighbor

Neighbor ID Pri State Dead Time Address Interface

10.0.5.1 1 FULL/BDR 00:00:31 10.0.5.1 GigabitEthernet0/0

Show ip protocols

Routing Protocol is "eigrp 10 "

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Default networks flagged in outgoing updates

Default networks accepted from incoming updates

Redistributing: eigrp 10, ospf 10 , connected

EIGRP-IPv4 Protocol for AS(10)

Metric weight K1=1, K2=0, K3=1, K4=0, K5=0

NSF-aware route hold timer is 240

Router-ID: 10.0.5.2

Topology : 0 (base)

Active Timer: 3 min

Distance: internal 90 external 170

Maximum path: 4

Maximum hopcount 100

Maximum metric variance 1

Automatic Summarization: disabled

Automatic address summarization:

Maximum path: 4

Routing for Networks:

10.0.6.0/24

Routing Information Sources:

Gateway Distance Last Update

10.0.6.2 90 0

Distance: internal 90 external 170

Routing Protocol is "ospf 10"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 10.0.6.1

It is an autonomous system boundary router

Redistributing External Routes from,

eigrp 10

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

Maximum path: 4

Routing for Networks:

10.0.5.0 0.0.0.255 area 1

Routing Information Sources:

Gateway Distance Last Update

10.0.4.1 110 00:03:01

10.0.5.1 110 00:02:56

10.0.6.1 110 00:02:57

Distance: (default is 110)

Show ip eigrp interface

IP-EIGRP interfaces for process 10

Xmit Queue Mean Pacing Time Multicast Pending

Interface Peers Un/Reliable SRTT Un/Reliable Flow Timer Routes

Gig0/1 1 0/0 1236 0/10 0 0

Router 7

Show run

interface GigabitEthernet0/0

ip address 10.0.8.2 255.255.255.0

duplex auto

speed auto

interface GigabitEthernet0/1

no ip address

duplex auto

speed auto

shutdown

interface Vlan1

no ip address

shutdown

router ospf 10

log-adjacency-changes

area 20 stub no-summary

network 10.0.8.0 0.0.0.255 area 2

Show ip ospf interface

GigabitEthernet0/0 is up, line protocol is up

Internet address is 10.0.8.2/24, Area 2

Process ID 10, Router ID 10.0.8.2, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State DR, Priority 1

Designated Router (ID) 10.0.8.2, Interface address 10.0.8.2

Backup Designated Router (ID) 10.0.8.1, Interface address 10.0.8.1

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

Hello due in 00:00:08

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 1, Adjacent neighbor count is 1

Adjacent with neighbor 10.0.8.1 (Backup Designated Router)

Suppress hello for 0 neighbor(s)

Show ip ospf neighbor

Neighbor ID Pri State Dead Time Address Interface

10.0.8.1 1 FULL/BDR 00:00:37 10.0.8.1 GigabitEthernet0/0

Show ip ospf protocols

Router 8

Show run

interface GigabitEthernet0/0

ip address 10.0.3.1 255.255.255.0

duplex auto

speed auto

interface GigabitEthernet0/1

ip address 10.0.2.2 255.255.255.0

duplex auto

speed auto

interface GigabitEthernet0/2

ip address 10.0.7.1 255.255.255.0

duplex auto

speed auto

interface Vlan1

no ip address

shutdown

router ospf 10

log-adjacency-changes

network 10.0.2.0 0.0.0.255 area 0

network 10.0.7.0 0.0.0.255 area 0

network 10.0.3.0 0.0.0.255 area 0

Show ip ospf interface

GigabitEthernet0/1 is up, line protocol is up

Internet address is 10.0.2.2/24, Area 0

Process ID 10, Router ID 10.0.7.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State DR, Priority 1

Designated Router (ID) 10.0.7.1, Interface address 10.0.2.2

Backup Designated Router (ID) 10.0.2.1, Interface address 10.0.2.1

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

Hello due in 00:00:08

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 1, Adjacent neighbor count is 1

Adjacent with neighbor 10.0.2.1 (Backup Designated Router)

Suppress hello for 0 neighbor(s)

GigabitEthernet0/0 is up, line protocol is up

Internet address is 10.0.3.1/24, Area 0

Process ID 10, Router ID 10.0.7.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State DR, Priority 1

Designated Router (ID) 10.0.7.1, Interface address 10.0.3.1

Backup Designated Router (ID) 10.0.4.1, Interface address 10.0.3.2

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

Hello due in 00:00:08

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 10.0.4.1 (Backup Designated Router)

Suppress hello for 0 neighbor(s)

GigabitEthernet0/2 is up, line protocol is up

Internet address is 10.0.7.1/24, Area 0

Process ID 10, Router ID 10.0.7.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State BDR, Priority 1

Designated Router (ID) 10.0.8.1, Interface address 10.0.7.2

Backup Designated Router (ID) 10.0.7.1, Interface address 10.0.7.1

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

Hello due in 00:00:08

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 10.0.8.1 (Designated Router)

Suppress hello for 0 neighbor(s)

Show ip ospf neighbor

Show ip protocols

Distance: (default is 110) Routing Protocol is "ospf 10"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 10.0.7.1

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

Maximum path: 4

Routing for Networks:

10.0.2.0 0.0.0.255 area 0

10.0.7.0 0.0.0.255 area 0

10.0.3.0 0.0.0.255 area 0

Routing Information Sources:

Gateway Distance Last Update

10.0.2.1 110 00:20:56

10.0.4.1 110 00:21:02

10.0.7.1 110 00:20:56

10.0.8.1 110 00:21:02

Router 9

Show run

interface GigabitEthernet0/0

no ip address

duplex auto

speed auto

shutdown

interface GigabitEthernet0/1

ip address 10.0.6.2 255.255.255.0

duplex auto

speed auto

interface Vlan1

no ip address

shutdown

router eigrp 10

redistribute ospf 10 metric 1000 33 255 1 1500

redistribute connected

network 10.0.6.0 0.0.0.255

router ospf 10

log-adjacency-changes

Show ip ospf protocols

Routing Protocol is "eigrp 10 "

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Default networks flagged in outgoing updates

Default networks accepted from incoming updates

Redistributing: eigrp 10, ospf 10 , connected

EIGRP-IPv4 Protocol for AS(10)

Metric weight K1=1, K2=0, K3=1, K4=0, K5=0

NSF-aware route hold timer is 240

Router-ID: 10.0.6.2

Topology : 0 (base)

Active Timer: 3 min

Distance: internal 90 external 170

Maximum path: 4

Maximum hopcount 100

Maximum metric variance 1

Automatic Summarization: disabled

Automatic address summarization:

Maximum path: 4

Routing for Networks:

10.0.6.0/24

Routing Information Sources:

Gateway Distance Last Update

10.0.6.1 90 0

Distance: internal 90 external 170

Routing Protocol is "ospf 10"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 10.0.6.2

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

Maximum path: 4

Routing for Networks:

Routing Information Sources:

Gateway Distance Last Update

Distance: (default is 110)

Show ip route eigrp

10.0.0.0/8 is variably subnetted, 3 subnets, 2 masks

D EX 10.0.5.0/24 [170/5376] via 10.0.6.1, 00:57:16, GigabitEthernet0/1

Show ip eigrp interface

IP-EIGRP interfaces for process 10

Xmit Queue Mean Pacing Time Multicast Pending

Interface Peers Un/Reliable SRTT Un/Reliable Flow Timer Routes

Gig0/1 1 0/0 1236 0/10 0 0

Problems

One issue I encountered during this lab was setting up the stubby area and totally stubby area. At the beginning, I was confused about the commands to set up the stubby and totally stubby area. When I attempted to configure it, I put the no summary when I was configuring the stubby area and didn’t put that for the totally stubby area. I realized that I mixed up the correct commands for the stubby area and totally stubby area. The no summary command is the command used to configure totally stubby area.

Another issue I had to go through was setting up EIGRP on router 9 and interface G0/1 on router 6. When I was starting to configure EIGRP, at the start I didn’t know the proper steps to set it up and as time went on, I looked up and researched how to setup EIGRP. When I was attempting to set up EIGRP, I didn’t setup the metric for the interfaces. I found out that I need to put the correct metrics for the interfaces. I also redistributed EIGRP on the border router of the EIGRP and NSSA area. When I typed the **“show router eigrp”** on router 9 there were no routes. I realized that I also had to redistribute OSPF on that router for the routes to show up and for it to connect to the other areas. Overall, I learned how to properly setup and configure EIGRP on a network.

Conclusion

This lab was necessary and very important since I learned how to setup multiple different area types and EIGRP. This lab helped me remember the correct commands to setup stubby area, totally stubby area, NSSA, and EIGRP. Additionally, I got to learn how the different area types plays a role in the network. After I completed the lab, I was able to ping across all of the networks and setup OSPFv2 with configurations of stubby area, totally stubby area, NSSA and EIGRP on eight networks. Overall, this lab was a good refresher and introduction for setting up OSPFv2 with stubby area, totally stubby area, NSSA, and EIGRP on several networks.