Kent Mark, Christian Williams

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Cpre 489 – Lab 8 Report

Summary:

In this lab we both learned more about Cisco network switches. We also learned how to use various Linux commands to configure the OSPF routing and then compare that to static routing. It was also cool learning about and setting up the loopback interface to the TA's switch and then sending pings to it. And although my partner and I had a hard time setting up the OSPF in the early going we were able to eventually get it all set up with the help of that TA and we both had a great time running the various commands and analyzing their output.

Exercise 1

Question 1:

Pings from my switch	**Pings from even numbered computer**
192.168.1.X - Successful	*192.168.1.X - Failed*
192.168.1.2 - Successful	*192.168.1.2 - Failed*
10.2.2.2 – Successful	*10.2.2.2 – Failed*
10.0.2.254 – Successful	*10.0.2.254 – Failed*

The pings from the even numbered computer failed because that computer couldn't reach the TA's switch. We don't think the TA's switch had our local IP's configured.

We believe that 3 static routes would have to be configured.

Exercise 2

Question 3:

Question 4:

```
[489labuser@co2061-06 ~]$ ping 192.168.1.2
PING 192.168.1.2 (192.168.1.2) 56(84) bytes of data.
64 bytes from 192.168.1.2: icmp_seq=1 ttl=253 time=0.632 ms
64 bytes from 192.168.1.2: icmp_seq=2 ttl=253 time=0.750 ms
64 bytes from 192.168.1.2: icmp_seq=3 ttl=253 time=0.720 ms
64 bytes from 192.168.1.2: icmp_seq=4 ttl=253 time=0.810 ms
^C
--- 192.168.1.2 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3001ms
rtt min/avg/max/mdev = 0.632/0.728/0.810/0.064 ms
[489labuser@co2061-06 ~]$ ping 10.2.2.2
PING 10.2.2.2 (10.2.2.2) 56(84) bytes of data.
64 bytes from 10.2.2.2: icmp_seq=1 ttl=253 time=0.711 ms
64 bytes from 10.2.2.2: icmp_seq=2 ttl=253 time=0.578 ms
64 bytes from 10.2.2.2: icmp_seq=3 ttl=253 time=0.849 ms
64 bytes from 10.2.2.2: icmp_seq=4 ttl=253 time=0.549 ms
^C
--- 10.2.2.2 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3001ms
rtt min/avg/max/mdev = 0.549/0.671/0.849/0.123 ms
[489labuser@co2061-06 ~]$ ping 10.0.2.254
PING 10.0.2.254 (10.0.2.254) 56(84) bytes of data.
64 bytes from 10.0.2.254: icmp_seq=1 ttl=253 time=1.45 ms
64 bytes from 10.0.2.254: icmp_seq=2 ttl=253 time=0.627 ms
64 bytes from 10.0.2.254: icmp_seq=3 ttl=253 time=0.747 ms
64 bytes from 10.0.2.254: icmp_seq=4 ttl=253 time=0.725 ms
^C
--- 10.0.2.254 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3002ms
rtt min/avg/max/mdev = 0.627/0.888/1.454/0.330 ms
[489labuser@co2061-06 ~]$
```

All of the pings were received.

Question 5:

```
co2061-9300-03#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, m - OMP
       n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
       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
       H - NHRP, G - NHRP registered, g - NHRP registration summary
       o - ODR, P - periodic downloaded static route, l - LISP
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR

Gateway of last resort is not set

      10.0.0.0/8 is variably subnetted, 15 subnets, 2 masks
O        10.0.2.0/24 [110/2] via 192.168.1.2, 00:50:10, GigabitEthernet1/0/2
C        10.0.6.0/24 is directly connected, GigabitEthernet1/0/1
L        10.0.6.254/32 is directly connected, GigabitEthernet1/0/1
O        10.0.8.0/24 [110/2] via 192.168.1.8, 00:14:50, GigabitEthernet1/0/2
O        10.0.16.0/24 [110/2] via 192.168.1.16, 00:27:30, GigabitEthernet1/0/2
O        10.0.18.0/24 [110/2] via 192.168.1.18, 00:46:07, GigabitEthernet1/0/2
O        10.0.20.0/24 [110/2] via 192.168.1.20, 00:24:05, GigabitEthernet1/0/2
O        10.0.24.0/24 [110/2] via 192.168.1.24, 00:39:01, GigabitEthernet1/0/2
O        10.2.2.2/32 [110/2] via 192.168.1.2, 00:45:51, GigabitEthernet1/0/2
C        10.6.6.6/32 is directly connected, Loopback0
O        10.8.8.8/32 [110/2] via 192.168.1.8, 00:14:35, GigabitEthernet1/0/2
O        10.16.16.16/32
           [110/2] via 192.168.1.16, 00:27:30, GigabitEthernet1/0/2
O        10.18.18.18/32
           [110/2] via 192.168.1.18, 00:46:07, GigabitEthernet1/0/2
O        10.20.20.20/32
           [110/2] via 192.168.1.20, 00:42:48, GigabitEthernet1/0/2
O        10.24.24.24/32
           [110/2] via 192.168.1.24, 00:39:01, GigabitEthernet1/0/2
      192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.1.0/24 is directly connected, GigabitEthernet1/0/2
L        192.168.1.6/32 is directly connected, GigabitEthernet1/0/2
```

It appears three routes are directly connected, twelve routes are connected via OSPF, and of those routes none of them use an area other than 0.

Question 6:

```
co2061-9300-03#show ip protocols
*** IP Routing is NSF aware ***

Routing Protocol is "ospf 121"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 10.5.5.5
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    10.0.5.0 0.0.0.255 area 0
    10.5.5.5 0.0.0.0 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
  Distance: (default is 110)

Routing Protocol is "ospf 102"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 10.2.2.2
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    10.0.6.0 0.0.0.255 area 0
    10.6.6.6 0.0.0.0 area 0
    192.168.1.0 0.0.0.255 area 0
    192.168.77.0 0.0.0.255 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    10.8.8.8             110      00:16:50
    10.12.12.12          110      00:34:05
    10.4.4.4             110      00:52:25
    10.24.24.24          110      00:41:16
    10.18.18.18          110      00:48:23
    10.16.16.16          110      00:29:45
    10.20.20.20          110      00:26:21
    192.168.1.2          110      00:48:06
  Distance: (default is 110)

Routing Protocol is "ospf 103"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 10.6.6.6
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    10.2.2.0 0.0.0.255 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
  Distance: (default is 110)
```

The Router ID is 10.2.2.2, which is the same as IP 10.2.2.2

Question 7:

Distance: 110

Question 8:

```
co2061-9300-03#show ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address         Interface
10.8.8.8          1   2WAY/DROTHER    00:00:35    192.168.1.8     GigabitEthernet1/0/2
10.16.16.16       1   2WAY/DROTHER    00:00:30    192.168.1.16    GigabitEthernet1/0/2
10.18.18.18       1   FULL/BDR        00:00:35    192.168.1.18    GigabitEthernet1/0/2
10.20.20.20       1   2WAY/DROTHER    00:00:37    192.168.1.20    GigabitEthernet1/0/2
10.24.24.24       1   2WAY/DROTHER    00:00:37    192.168.1.24    GigabitEthernet1/0/2
192.168.1.2       1   FULL/DR         00:00:35    192.168.1.2     GigabitEthernet1/0/2
```

When we ran this command there wasn't a neighbor with the ID 10.2.2.2

Question 9:

```
co2061-9300-03#show ip ospf interface
Loopback0 is up, line protocol is up
  Internet Address 10.6.6.6/32, Interface ID 54, Area 0
  Attached via Network Statement
  Process ID 102, Router ID 10.2.2.2, Network Type LOOPBACK, Cost: 1
  Topology-MTID    Cost    Disabled    Shutdown      Topology Name
        0           1         no           no            Base
  Loopback interface is treated as a stub Host
GigabitEthernet1/0/1 is up, line protocol is up (connected)
  Internet Address 10.0.6.254/24, Interface ID 53, Area 0
  Attached via Network Statement
  Process ID 102, Router ID 10.2.2.2, Network Type BROADCAST, Cost: 1
  Topology-MTID    Cost    Disabled    Shutdown      Topology Name
        0           1         no           no            Base
  Transmit Delay is 1 sec, State DR, Priority 1
  Designated Router (ID) 10.2.2.2, Interface address 10.0.6.254
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    oob-resync timeout 40
    Hello due in 00:00:01
  Supports Link-local Signaling (LLS)
  Cisco NSF helper support enabled
  IETF NSF helper support enabled
  Can be protected by per-prefix Loop-Free FastReroute
  Can be used for per-prefix Loop-Free FastReroute repair paths
  Index 1/3/3, flood queue length 0
  Next 0x0(0)/0x0(0)/0x0(0)
  Last flood scan length is 0, maximum is 0
  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)
GigabitEthernet1/0/2 is up, line protocol is up (connected)
  Internet Address 192.168.1.6/24, Interface ID 55, Area 0
  Attached via Network Statement
  Process ID 102, Router ID 10.2.2.2, Network Type BROADCAST, Cost: 1
  Topology-MTID    Cost    Disabled    Shutdown      Topology Name
        0           1         no           no            Base
  Transmit Delay is 1 sec, State DROTHER, Priority 1
  Designated Router (ID) 192.168.1.2, Interface address 192.168.1.2
  Backup Designated router (ID) 10.18.18.18, Interface address 192.168.1.18
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    oob-resync timeout 40
    Hello due in 00:00:08
  Supports Link-local Signaling (LLS)
  Cisco NSF helper support enabled
  IETF NSF helper support enabled
  Can be protected by per-prefix Loop-Free FastReroute
  Can be used for per-prefix Loop-Free FastReroute repair paths
  Index 1/1/1, flood queue length 0
  Next 0x0(0)/0x0(0)/0x0(0)
  Last flood scan length is 0, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 6, Adjacent neighbor count is 2
    Adjacent with neighbor 10.18.18.18  (Backup Designated Router)
```

10.6.6.6/32 – Cost =1

10.0.6.254/24 – Cost = 1

192.168.1.6/24 – Cost = 1