F29DC 2024 Lab 6
Routing Algorithm

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Topology A Configuration

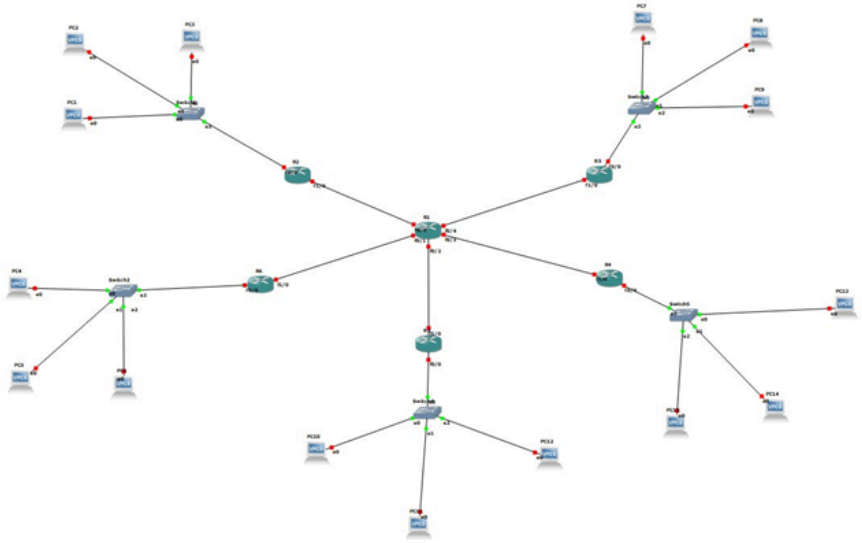

Image 1.1 : Setting up all the VPC's with their switches and respective routers to the main router.

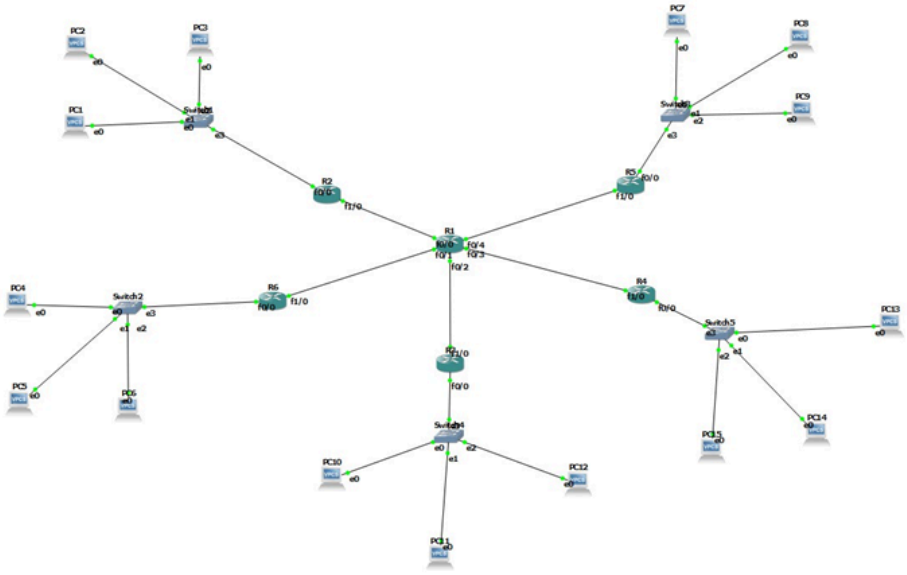

Image 1.2 : Starting the connections.

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#no router rip
R1(config)#router eigrp 1
R1(config-router)#network 10.0.1.2 255.255.255.0
R1(config-router)#network 10.0.2.2 255.255.255.0
R1(config-router)#network 10.0.3.2 255.255.255.0
R1(config-router)#network 10.0.4.2 255.255.255.0
R1(config-router)#network 10.0.5.2 255.255.255.0
R1(config-router)#^Z
```

```
IP-EIGRP neighbors for process 1
H   Address                 Interface       Hold Uptime   SRTT   RTO  Q  Seq
                                            (sec)         (ms)       Cnt Num
4   10.0.2.1                Fa0/1             11 00:01:49   68   408  0  6
3   10.0.5.1                Fa0/4             14 00:02:53   68   408  0  6
2   10.0.4.1                Fa0/3             12 00:04:25   69   414  0  6
1   10.0.3.1                Fa0/2             11 00:05:56   78   468  0  6
0   10.0.1.1                Fa0/0             10 00:07:04   66   396  0  6
R1#
```

```
IP-EIGRP Topology Table for AS(1)/ID(10.0.5.2)

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

P 10.0.2.0/24, 1 successors, FD is 28160
        via Connected, FastEthernet0/1
P 10.0.3.0/24, 1 successors, FD is 28160
        via Connected, FastEthernet0/2
P 10.0.1.0/24, 1 successors, FD is 28160
        via Connected, FastEthernet0/0
P 10.0.4.0/24, 1 successors, FD is 28160
        via Connected, FastEthernet0/3
P 10.0.5.0/24, 1 successors, FD is 28160
        via Connected, FastEthernet0/4
P 192.168.1.0/24, 1 successors, FD is 30720
        via 10.0.1.1 (30720/28160), FastEthernet0/0
P 192.168.2.0/24, 1 successors, FD is 30720
        via 10.0.2.1 (30720/28160), FastEthernet0/1
P 192.168.3.0/24, 1 successors, FD is 30720
        via 10.0.3.1 (30720/28160), FastEthernet0/2
P 192.168.4.0/24, 1 successors, FD is 30720
        via 10.0.4.1 (30720/28160), FastEthernet0/3

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

P 192.168.5.0/24, 1 successors, FD is 30720
        via 10.0.5.1 (30720/28160), FastEthernet0/4
R1#
```

Image 1.3 : Setting up R1 router.

```
R2(config)#no router rip
R2(config)#router eigrp 1
R2(config-router)#network 192.168.1.254 255.255.255.0
R2(config-router)#network 10.0.1.1 255.255.255.0
R2(config-router)#no auto
*Mar  1 00:43:15.543: %DUAL-5-NBRCHANGE: IP-EIGRP(0) 1: Neighbor 10.0.1.2 (FastEthernet1/0) is up: new
adjacency
R2(config-router)#no auto-summary
R2(config-router)#
*Mar  1 00:43:24.847: %DUAL-5-NBRCHANGE: IP-EIGRP(0) 1: Neighbor 10.0.1.2 (FastEthernet1/0) is resync:
summary configured
R2(config-router)#^Z
```

```
IP-EIGRP neighbors for process 1
H   Address                 Interface       Hold Uptime   SRTT   RTO  Q  Seq
                                            (sec)         (ms)       Cnt Num
0   10.0.1.2                Fa1/0             13 00:12:43   47  1426  0  37
```

```
IP-EIGRP Topology Table for AS(1)/ID(192.168.1.254)

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

P 10.0.2.0/24, 1 successors, FD is 30720
        via 10.0.1.2 (30720/28160), FastEthernet1/0
P 10.0.3.0/24, 1 successors, FD is 30720
        via 10.0.1.2 (30720/28160), FastEthernet1/0
P 10.0.1.0/24, 1 successors, FD is 28160
        via Connected, FastEthernet1/0
P 10.0.4.0/24, 1 successors, FD is 30720
        via 10.0.1.2 (30720/28160), FastEthernet1/0
P 10.0.5.0/24, 1 successors, FD is 30720
        via 10.0.1.2 (30720/28160), FastEthernet1/0
P 192.168.1.0/24, 1 successors, FD is 28160
        via Connected, FastEthernet0/0
P 192.168.2.0/24, 1 successors, FD is 33280
        via 10.0.1.2 (33280/30720), FastEthernet1/0
P 192.168.3.0/24, 1 successors, FD is 33280
        via 10.0.1.2 (33280/30720), FastEthernet1/0
P 192.168.4.0/24, 1 successors, FD is 33280
        via 10.0.1.2 (33280/30720), FastEthernet1/0

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

P 192.168.5.0/24, 1 successors, FD is 33280
        via 10.0.1.2 (33280/30720), FastEthernet1/0
R2#
```

Image 1.4 : Setting up R2 router.

```
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#no router rip
R3(config)#router eigrp 1
R3(config-router)#network 192.168.3.254 255.255.255.0
R3(config-router)#network 10.0.3.1 255.255.255.0
R3(config-router)#no aiu
*Mar  1 00:42:31.763: %DUAL-5-NBRCHANGE: IP-EIGRP(0) 1: Neighbor 10.0.3.2 (FastEthernet1/0) is up: new
adjacency
R3(config-router)#no auto-summary
R3(config-router)#^Z
R3#
```

```
IP-EIGRP neighbors for process 1
H   Address                 Interface       Hold Uptime   SRTT   RTO  Q  Seq
                                            (sec)         (ms)       Cnt Num
0   10.0.3.2                Fa1/0             12 00:13:20   61  1234  0  36
```

```
IP-EIGRP Topology Table for AS(1)/ID(192.168.3.254)

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

P 10.0.2.0/24, 1 successors, FD is 30720
        via 10.0.3.2 (30720/28160), FastEthernet1/0
P 10.0.3.0/24, 1 successors, FD is 28160
        via Connected, FastEthernet1/0
P 10.0.1.0/24, 1 successors, FD is 30720
        via 10.0.3.2 (30720/28160), FastEthernet1/0
P 10.0.4.0/24, 1 successors, FD is 30720
        via 10.0.3.2 (30720/28160), FastEthernet1/0
P 10.0.5.0/24, 1 successors, FD is 30720
        via 10.0.3.2 (30720/28160), FastEthernet1/0
P 192.168.1.0/24, 1 successors, FD is 33280
        via 10.0.3.2 (33280/30720), FastEthernet1/0
P 192.168.2.0/24, 1 successors, FD is 33280
        via 10.0.3.2 (33280/30720), FastEthernet1/0
P 192.168.3.0/24, 1 successors, FD is 28160
        via Connected, FastEthernet0/0
P 192.168.4.0/24, 1 successors, FD is 33280
        via 10.0.3.2 (33280/30720), FastEthernet1/0

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

P 192.168.5.0/24, 1 successors, FD is 33280
        via 10.0.3.2 (33280/30720), FastEthernet1/0
R3#
```

Image 1.5 : Setting up R3 router.

```
R4#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R4(config)#no router rip
R4(config)#router eigrp 1
R4(config-router)#network 192.168.4.254 255.255.255.0
R4(config-router)#network 10.0.4.1 255.255.255.0
R4(config-router)#
*Mar  1 00:44:03.135: %DUAL-5-NBRCHANGE: IP-EIGRP(0) 1: Neighbor 10.0.4.2 (FastEthernet1/0) is up: new
adjacency
R4(config-router)#no auto-summary
R4(config-router)#^Z
R4#
```

```
IP-EIGRP neighbors for process 1
H   Address                 Interface       Hold Uptime   SRTT   RTO  Q  Seq
                                            (sec)         (ms)       Cnt Num
0   10.0.4.2                Fa1/0             14 00:13:29  848  5000  0  38
```

```
IP-EIGRP Topology Table for AS(1)/ID(192.168.4.254)

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

P 10.0.2.0/24, 1 successors, FD is 30720
        via 10.0.4.2 (30720/28160), FastEthernet1/0
P 10.0.3.0/24, 1 successors, FD is 30720
        via 10.0.4.2 (30720/28160), FastEthernet1/0
P 10.0.1.0/24, 1 successors, FD is 30720
        via 10.0.4.2 (30720/28160), FastEthernet1/0
P 10.0.4.0/24, 1 successors, FD is 28160
        via Connected, FastEthernet1/0
P 10.0.5.0/24, 1 successors, FD is 30720
        via 10.0.4.2 (30720/28160), FastEthernet1/0
P 192.168.1.0/24, 1 successors, FD is 33280
        via 10.0.4.2 (33280/30720), FastEthernet1/0
P 192.168.2.0/24, 1 successors, FD is 33280
        via 10.0.4.2 (33280/30720), FastEthernet1/0
P 192.168.3.0/24, 1 successors, FD is 33280
        via 10.0.4.2 (33280/30720), FastEthernet1/0
P 192.168.4.0/24, 1 successors, FD is 28160
        via Connected, FastEthernet0/0

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

P 192.168.5.0/24, 1 successors, FD is 33280
        via 10.0.4.2 (33280/30720), FastEthernet1/0
R4#
```

Image 1.6 : Setting up R4 router.

```
R5#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R5(config)#no router rip
R5(config)#router eigrp 1
R5(config-router)#network 192.168.5.254 255.255.255.0
R5(config-router)#network 10.0.5.1 255.255.255.0
R5(config-router)#
*Mar  1 00:45:35.439: %DUAL-5-NBRCHANGE: IP-EIGRP(0) 1: Neighbor 10.0.5.2 (FastEthernet1/0) is up: new
adjacency
R5(config-router)#no auto-summary
R5(config-router)#^Z
```

```
IP-EIGRP neighbors for process 1
H   Address                 Interface       Hold Uptime   SRTT   RTO  Q  Seq
                                            (sec)         (ms)       Cnt Num
0   10.0.5.2                Fa1/0             11 00:13:13  849  5000  0  35
```

```
IP-EIGRP Topology Table for AS(1)/ID(192.168.5.254)

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

P 10.0.2.0/24, 1 successors, FD is 30720
        via 10.0.5.2 (30720/28160), FastEthernet1/0
P 10.0.3.0/24, 1 successors, FD is 30720
        via 10.0.5.2 (30720/28160), FastEthernet1/0
P 10.0.1.0/24, 1 successors, FD is 30720
        via 10.0.5.2 (30720/28160), FastEthernet1/0
P 10.0.4.0/24, 1 successors, FD is 30720
        via 10.0.5.2 (30720/28160), FastEthernet1/0
P 10.0.5.0/24, 1 successors, FD is 28160
        via Connected, FastEthernet1/0
P 192.168.1.0/24, 1 successors, FD is 33280
        via 10.0.5.2 (33280/30720), FastEthernet1/0
P 192.168.2.0/24, 1 successors, FD is 33280
        via 10.0.5.2 (33280/30720), FastEthernet1/0
P 192.168.3.0/24, 1 successors, FD is 33280
        via 10.0.5.2 (33280/30720), FastEthernet1/0
P 192.168.4.0/24, 1 successors, FD is 33280
        via 10.0.5.2 (33280/30720), FastEthernet1/0

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

P 192.168.5.0/24, 1 successors, FD is 28160
        via Connected, FastEthernet0/0
R5#
```

Image 1.7 : Setting up R5 router.

```
R6#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R6(config)#no router rip
R6(config)#router eigrp 1
R6(config-router)#network 192.168.2.254 255.255.255.0
R6(config-router)#network 10.0.2.1 255.255.255.0
R6(config-router)#no
*Mar  1 00:46:38.879: %DUAL-5-NBRCHANGE: IP-EIGRP(0) 1: Neighbor 10.0.2.2 (FastEthernet1/0) is up: new
adjacency
R6(config-router)#no auto-summary
R6(config-router)#^Z
R6#
```

```
IP-EIGRP neighbors for process 1
H   Address                 Interface       Hold Uptime   SRTT   RTO  Q  Seq
                                            (sec)         (ms)       Cnt Num
0   10.0.2.2                Fa1/0             14 00:20:42   54   324  0  40
```

```
IP-EIGRP Topology Table for AS(1)/ID(192.168.2.254)

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

P 10.0.2.0/24, 1 successors, FD is 28160
        via Connected, FastEthernet1/0
P 10.0.3.0/24, 1 successors, FD is 30720
        via 10.0.2.2 (30720/28160), FastEthernet1/0
P 10.0.1.0/24, 1 successors, FD is 30720
        via 10.0.2.2 (30720/28160), FastEthernet1/0
P 10.0.4.0/24, 1 successors, FD is 30720
        via 10.0.2.2 (30720/28160), FastEthernet1/0
P 10.0.5.0/24, 1 successors, FD is 30720
        via 10.0.2.2 (30720/28160), FastEthernet1/0
P 192.168.1.0/24, 1 successors, FD is 33280
        via 10.0.2.2 (33280/30720), FastEthernet1/0
P 192.168.2.0/24, 1 successors, FD is 28160
        via Connected, FastEthernet0/0
P 192.168.3.0/24, 1 successors, FD is 33280
        via 10.0.2.2 (33280/30720), FastEthernet1/0
P 192.168.4.0/24, 1 successors, FD is 33280
        via 10.0.2.2 (33280/30720), FastEthernet1/0

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

P 192.168.5.0/24, 1 successors, FD is 33280
        via 10.0.2.2 (33280/30720), FastEthernet1/0
R6#
```

Image 1.8 Setting up R6 router.

```
R1#show ip route eigrp
D    192.168.4.0/24 [90/30720] via 10.0.4.1, 00:03:54, FastEthernet0/3
D    192.168.5.0/24 [90/30720] via 10.0.5.1, 00:03:57, FastEthernet0/4
D    192.168.1.0/24 [90/30720] via 10.0.1.1, 00:03:54, FastEthernet0/0
D    192.168.2.0/24 [90/30720] via 10.0.2.1, 00:03:57, FastEthernet0/1
D    192.168.3.0/24 [90/30720] via 10.0.3.1, 00:03:50, FastEthernet0/2
R1#
```

Image 1.9 : Showing R1 route .

```
R2#show ip route eigrp
D    192.168.4.0/24 [90/33280] via 10.0.1.2, 00:04:28, FastEthernet1/0
D    192.168.5.0/24 [90/33280] via 10.0.1.2, 00:04:28, FastEthernet1/0
     10.0.0.0/24 is subnetted, 6 subnets
D       10.0.12.0 [90/30720] via 10.0.1.2, 00:04:28, FastEthernet1/0
D       10.0.2.0 [90/30720] via 10.0.1.2, 00:04:28, FastEthernet1/0
D       10.0.3.0 [90/30720] via 10.0.1.2, 00:04:28, FastEthernet1/0
D       10.0.4.0 [90/30720] via 10.0.1.2, 00:04:28, FastEthernet1/0
D       10.0.5.0 [90/30720] via 10.0.1.2, 00:04:28, FastEthernet1/0
D    192.168.2.0/24 [90/33280] via 10.0.1.2, 00:04:28, FastEthernet1/0
D    192.168.3.0/24 [90/33280] via 10.0.1.2, 00:04:25, FastEthernet1/0
R2#
```

Image 1.10 : Showing R2 route .

```
R3#show ip route eigrp
D    192.168.4.0/24 [90/33280] via 10.0.3.2, 00:04:39, FastEthernet1/0
D    192.168.5.0/24 [90/33280] via 10.0.3.2, 00:04:39, FastEthernet1/0
     10.0.0.0/24 is subnetted, 6 subnets
D       10.0.12.0 [90/30720] via 10.0.3.2, 00:04:39, FastEthernet1/0
D       10.0.2.0 [90/30720] via 10.0.3.2, 00:04:39, FastEthernet1/0
D       10.0.1.0 [90/30720] via 10.0.3.2, 00:04:39, FastEthernet1/0
D       10.0.4.0 [90/30720] via 10.0.3.2, 00:04:39, FastEthernet1/0
D       10.0.5.0 [90/30720] via 10.0.3.2, 00:04:39, FastEthernet1/0
D    192.168.1.0/24 [90/33280] via 10.0.3.2, 00:04:39, FastEthernet1/0
D    192.168.2.0/24 [90/33280] via 10.0.3.2, 00:04:39, FastEthernet1/0
R3#
```

Image 1.11 : Showing R3 route .

```
R4#show ip route eigrp
D    192.168.5.0/24 [90/33280] via 10.0.4.2, 00:05:02, FastEthernet1/0
     10.0.0.0/24 is subnetted, 6 subnets
D       10.0.12.0 [90/30720] via 10.0.4.2, 00:05:02, FastEthernet1/0
D       10.0.2.0 [90/30720] via 10.0.4.2, 00:05:02, FastEthernet1/0
D       10.0.3.0 [90/30720] via 10.0.4.2, 00:05:02, FastEthernet1/0
D       10.0.1.0 [90/30720] via 10.0.4.2, 00:05:02, FastEthernet1/0
D       10.0.5.0 [90/30720] via 10.0.4.2, 00:05:02, FastEthernet1/0
D    192.168.1.0/24 [90/33280] via 10.0.4.2, 00:05:02, FastEthernet1/0
D    192.168.2.0/24 [90/33280] via 10.0.4.2, 00:05:02, FastEthernet1/0
D    192.168.3.0/24 [90/33280] via 10.0.4.2, 00:04:58, FastEthernet1/0
R4#
```

Image 1.12 : Showing R4 route .

```
R5#show ip route eigrp
D    192.168.4.0/24 [90/33280] via 10.0.5.2, 00:05:24, FastEthernet1/0
     10.0.0.0/24 is subnetted, 6 subnets
D       10.0.12.0 [90/30720] via 10.0.5.2, 00:05:24, FastEthernet1/0
D       10.0.2.0 [90/30720] via 10.0.5.2, 00:05:24, FastEthernet1/0
D       10.0.3.0 [90/30720] via 10.0.5.2, 00:05:24, FastEthernet1/0
D       10.0.1.0 [90/30720] via 10.0.5.2, 00:05:24, FastEthernet1/0
D       10.0.4.0 [90/30720] via 10.0.5.2, 00:05:24, FastEthernet1/0
D    192.168.1.0/24 [90/33280] via 10.0.5.2, 00:05:24, FastEthernet1/0
D    192.168.2.0/24 [90/33280] via 10.0.5.2, 00:05:24, FastEthernet1/0
D    192.168.3.0/24 [90/33280] via 10.0.5.2, 00:05:21, FastEthernet1/0
R5#
```

Image 1.13 : Showing R5 route .

```
R6#show ip route eigrp
D    192.168.4.0/24 [90/33280] via 10.0.2.2, 00:05:40, FastEthernet1/0
D    192.168.5.0/24 [90/33280] via 10.0.2.2, 00:05:42, FastEthernet1/0
     10.0.0.0/24 is subnetted, 6 subnets
D       10.0.12.0 [90/30720] via 10.0.2.2, 00:05:42, FastEthernet1/0
D       10.0.3.0 [90/30720] via 10.0.2.2, 00:05:42, FastEthernet1/0
D       10.0.1.0 [90/30720] via 10.0.2.2, 00:05:42, FastEthernet1/0
D       10.0.4.0 [90/30720] via 10.0.2.2, 00:05:42, FastEthernet1/0
D       10.0.5.0 [90/30720] via 10.0.2.2, 00:05:42, FastEthernet1/0
D    192.168.1.0/24 [90/33280] via 10.0.2.2, 00:05:39, FastEthernet1/0
D    192.168.3.0/24 [90/33280] via 10.0.2.2, 00:05:36, FastEthernet1/0
R6#
```

Image 1.14 : Showing R6 route .

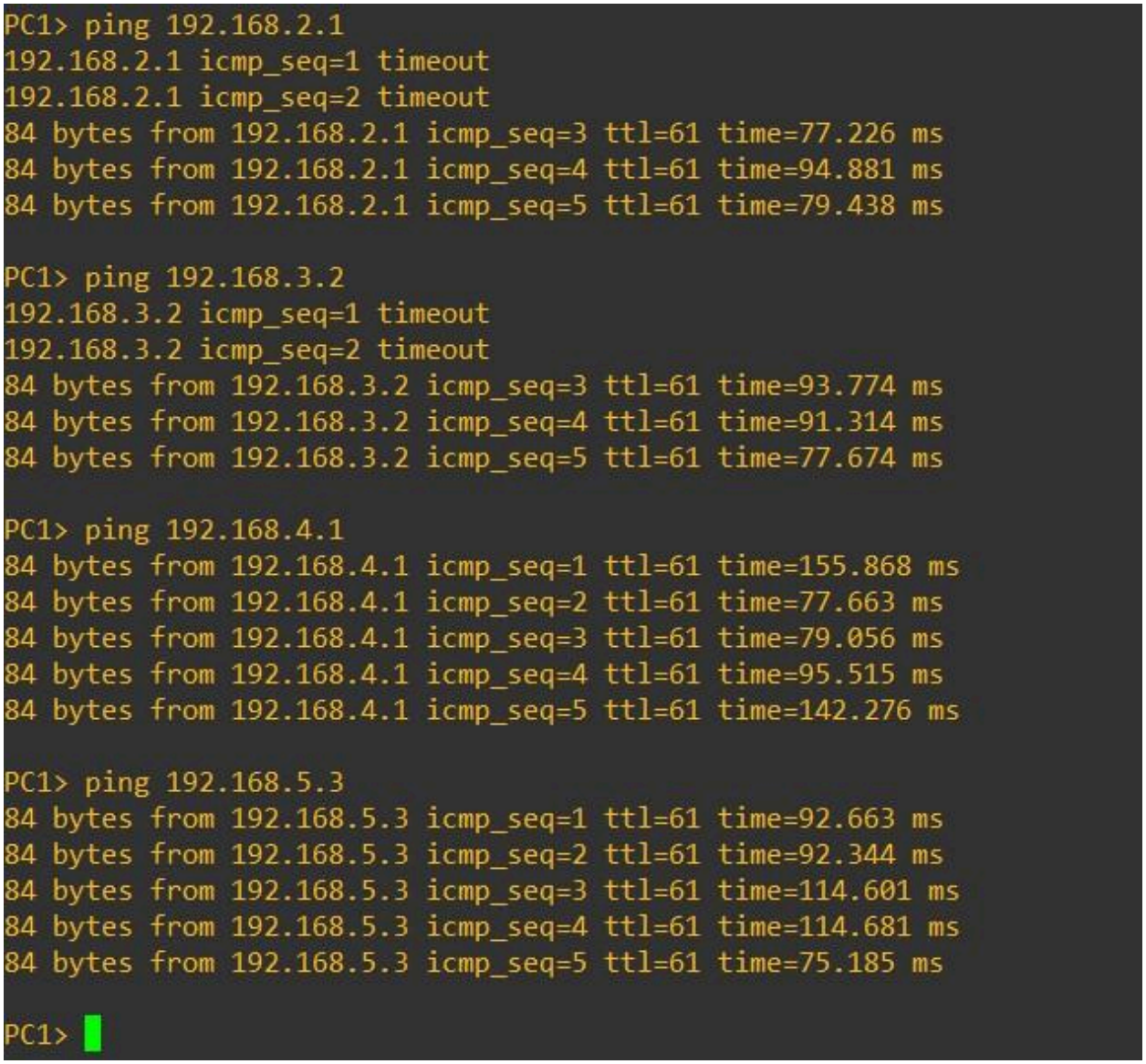

Image 1.15 : Pinging PC1 with other PC's.

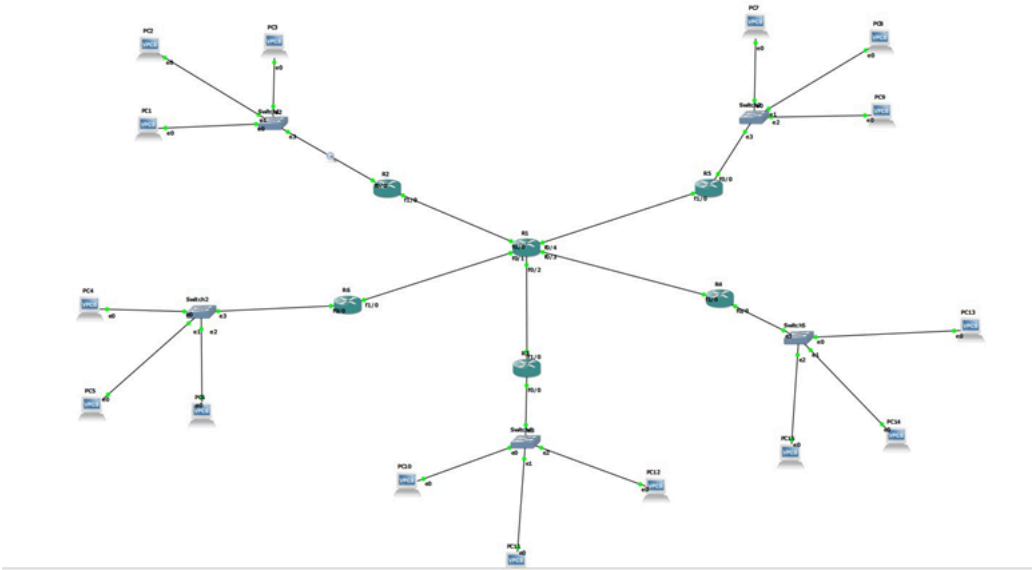

Image 1.16 : Starting Wireshark connections.

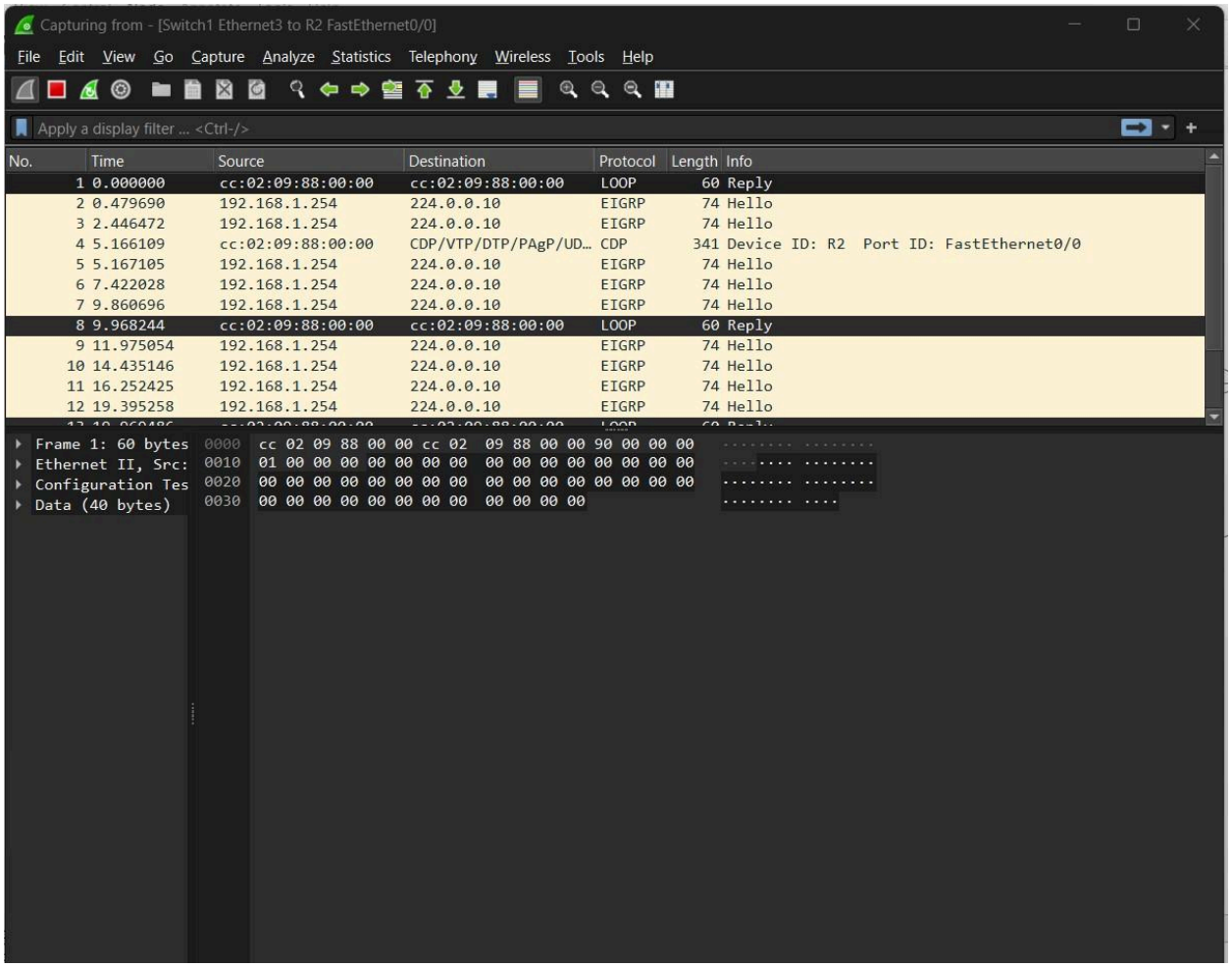

Image 1.17 : Checking the Wireshark.

Topology B Configuration

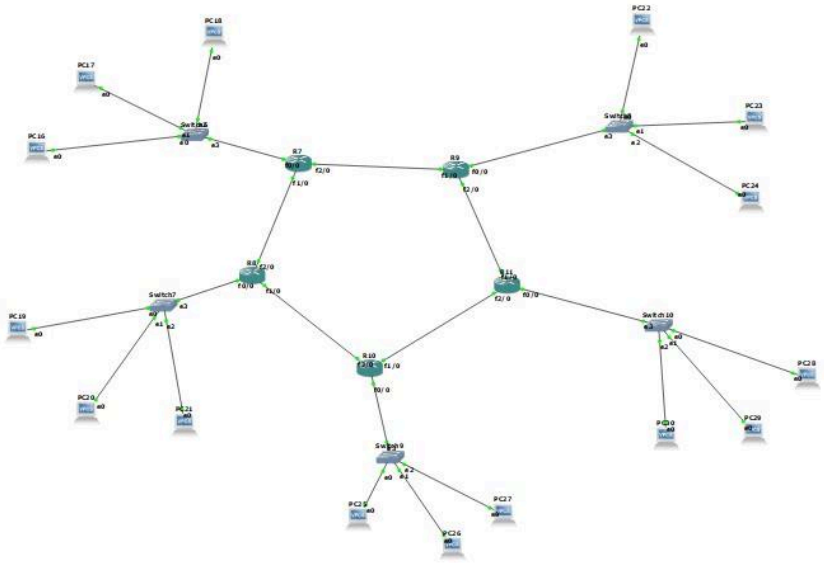

Image 2.1 : Setting up all the VPC's with their switches and respective routers to the main router.

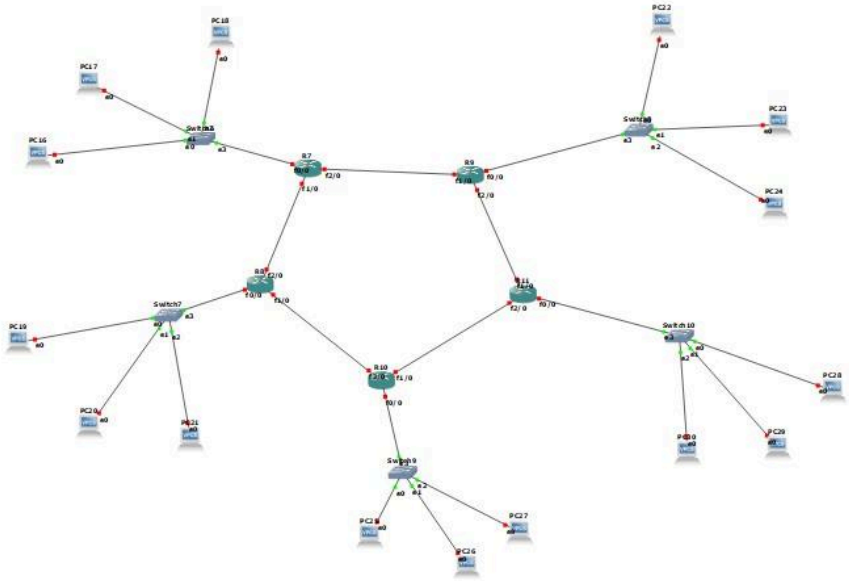

Image 2.2 : Starting the connections.

```
R7#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R7(config)#no router rip
R7(config)#router ospf 1
R7(config-router)#network 192.168.7.254 255.255.255.0 area 0
R7(config-router)#network 10.0.7.1 255.255.255.0 area 0
R7(config-router)#network 10.0.9.2 255.255.255.0 area 0
R7(config-router)#^Z
R7#
```

```
R7#sh ip ospf neig

Neighbor ID     Pri   State           Dead Time   Address         Interface
192.168.9.254     1   FULL/DR         00:00:35    10.0.9.1        FastEthernet2/0
192.168.8.254     1   FULL/DR         00:00:36    10.0.7.2        FastEthernet1/0
R7#
```

```
R7#sh ip ospf database

            OSPF Router with ID (10.0.9.2) (Process ID 1)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
10.0.9.2        10.0.9.2        666         0x80000001 0x00FD1B 0

            OSPF Router with ID (192.168.7.254) (Process ID 100)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
192.168.7.254   192.168.7.254   723         0x80000002 0x001C57 3
192.168.8.254   192.168.8.254   719         0x80000003 0x00056B 3
192.168.9.254   192.168.9.254   719         0x80000003 0x00CE96 3
192.168.10.254  192.168.10.254  715         0x80000003 0x0095CE 3
192.168.11.254  192.168.11.254  720         0x80000002 0x00332A 3

                Net Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum
10.0.7.2        192.168.8.254   724         0x80000001 0x00C313
 --More--
```

Image 2.3 : Setting up R1 router.

```
R8#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R8(config)#no router rip
R8(config)#router ospf 1
R8(config-router)#network 192.168.8.254 255.255.255.0
% Incomplete command.

R8(config-router)#network 192.168.8.254 255.255.255.0 area 0
R8(config-router)#network 10.0.7.2 255.255.255.0 area 0
R8(config-router)#network 10.0.8.1 255.255.255.0 area 0
R8(config-router)#^Z
R8#
```

```
R8#sh ip ospf neig

Neighbor ID     Pri   State           Dead Time   Address         Interface
192.168.10.254    1   FULL/DR         00:00:38    10.0.8.2        FastEthernet1/0
192.168.7.254     1   FULL/BDR        00:00:38    10.0.7.1        FastEthernet2/0
```

```
R8#sh ip ospf database

            OSPF Router with ID (10.0.8.1) (Process ID 1)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
10.0.8.1        10.0.8.1        620         0x80000001 0x0020FC 0

            OSPF Router with ID (192.168.8.254) (Process ID 100)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
192.168.7.254   192.168.7.254   773         0x80000002 0x001C57 3
192.168.8.254   192.168.8.254   767         0x80000003 0x00056B 3
192.168.9.254   192.168.9.254   769         0x80000003 0x00CE96 3
192.168.10.254  192.168.10.254  762         0x80000003 0x0095CE 3
192.168.11.254  192.168.11.254  769         0x80000002 0x00332A 3

                Net Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum
10.0.7.2        192.168.8.254   772         0x80000001 0x00C313
 --More--
```

Image 2.4 : Setting up R2 router.

```
R9#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R9(config)#no router rip
R9(config)#router ospf 1
R9(config-router)#network 192.168.9.254 255.255.255.0
% Incomplete command.

R9(config-router)#network 192.168.9.254 255.255.255.0 area 0
R9(config-router)#network 10.0.11.2 255.255.255.0 area 0
R9(config-router)#network 10.0.9.1 255.255.255.0 area 0
R9(config-router)#^Z
```

```
R9#sh ip ospf neig

Neighbor ID     Pri   State           Dead Time   Address         Interface
192.168.11.254    1   FULL/DR         00:00:34    10.0.11.1       FastEthernet2/0
192.168.7.254     1   FULL/BDR        00:00:34    10.0.9.2        FastEthernet1/0
```

```
R9#sh ip ospf database

            OSPF Router with ID (10.0.11.2) (Process ID 1)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
10.0.11.2       10.0.11.2       608         0x80000001 0x00D93B 0

            OSPF Router with ID (192.168.9.254) (Process ID 100)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
192.168.7.254   192.168.7.254   881         0x80000002 0x001C57 3
192.168.8.254   192.168.8.254   877         0x80000003 0x00056B 3
192.168.9.254   192.168.9.254   875         0x80000003 0x00CE96 3
192.168.10.254  192.168.10.254  871         0x80000003 0x0095CE 3
192.168.11.254  192.168.11.254  876         0x80000002 0x00332A 3

                Net Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum
10.0.7.2        192.168.8.254   882         0x80000001 0x00C313
 --More--
```

Image 2.5 : Setting up R3 router.

```
R10#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R10(config)#no router rip
R10(config)#router ospf 1
R10(config-router)#network 192.168.10.254 255.255.255.0
% Incomplete command.

R10(config-router)#network 192.168.10.254 255.255.255.0 area 0
R10(config-router)#network 10.0.8.2 255.255.255.0 area 0\
                                                       ^
% Invalid input detected at '^' marker.

R10(config-router)#network 10.0.8.2 255.255.255.0 area 0
R10(config-router)#network 10.0.10.1 255.255.255.0 area 0
R10(config-router)#^Z
R10#
```

```
R10#sh ip ospf neig

Neighbor ID     Pri   State           Dead Time   Address         Interface
192.168.11.254    1   FULL/DR         00:00:38    10.0.10.2       FastEthernet1/0
192.168.8.254     1   FULL/BDR        00:00:39    10.0.8.1        FastEthernet2/0
```

```
R10#sh ip ospf database

            OSPF Router with ID (10.0.10.1) (Process ID 1)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
10.0.10.1       10.0.10.1       575         0x80000001 0x00FB1D 0

            OSPF Router with ID (192.168.10.254) (Process ID 100)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
192.168.7.254   192.168.7.254   955         0x80000002 0x001C57 3
192.168.8.254   192.168.8.254   947         0x80000003 0x00056B 3
192.168.9.254   192.168.9.254   948         0x80000003 0x00CE96 3
192.168.10.254  192.168.10.254  942         0x80000003 0x0095CE 3
192.168.11.254  192.168.11.254  948         0x80000002 0x00332A 3

                Net Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum
10.0.7.2        192.168.8.254   956         0x80000001 0x00C313
 --More--
```

Image 2.6 : Setting up R4 router.

```
R11#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R11(config)#no router rip
R11(config)#router ospf 1
R11(config-router)#network 192.168.11.254 255.255.255.0
% Incomplete command.

R11(config-router)#network 192.168.11.254 255.255.255.0 area 0
R11(config-router)#network 10.0.10.2 255.255.255.0 area 0
R11(config-router)#network 10.0.11.1 255.255.255.0 area 0
R11(config-router)#^Z
R11#
*Mar  1 00:28:03.099: %SYS-5-CONFIG_I: Configured from console by console
```

```
R11#sh ip ospf neig

Neighbor ID     Pri   State           Dead Time   Address         Interface
192.168.9.254     1   FULL/BDR        00:00:33    10.0.11.2       FastEthernet1/0
192.168.10.254    1   FULL/BDR        00:00:33    10.0.10.1       FastEthernet2/0
```

```
R11#sh ip ospf database

            OSPF Router with ID (10.0.10.2) (Process ID 1)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
10.0.10.2       10.0.10.2       1188        0x80000001 0x00EB2B 0

            OSPF Router with ID (10.0.11.1) (Process ID 1000)

            OSPF Router with ID (192.168.11.254) (Process ID 100)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
192.168.7.254   192.168.7.254   1684        0x80000002 0x001C57 3
192.168.8.254   192.168.8.254   1679        0x80000003 0x00056B 3
192.168.9.254   192.168.9.254   1678        0x80000003 0x00CE96 3
192.168.10.254  192.168.10.254  1673        0x80000003 0x0095CE 3
192.168.11.254  192.168.11.254  1677        0x80000002 0x00332A 3

                Net Link States (Area 0)

 --More--
```

Image 2.7 : Setting up R5 router.

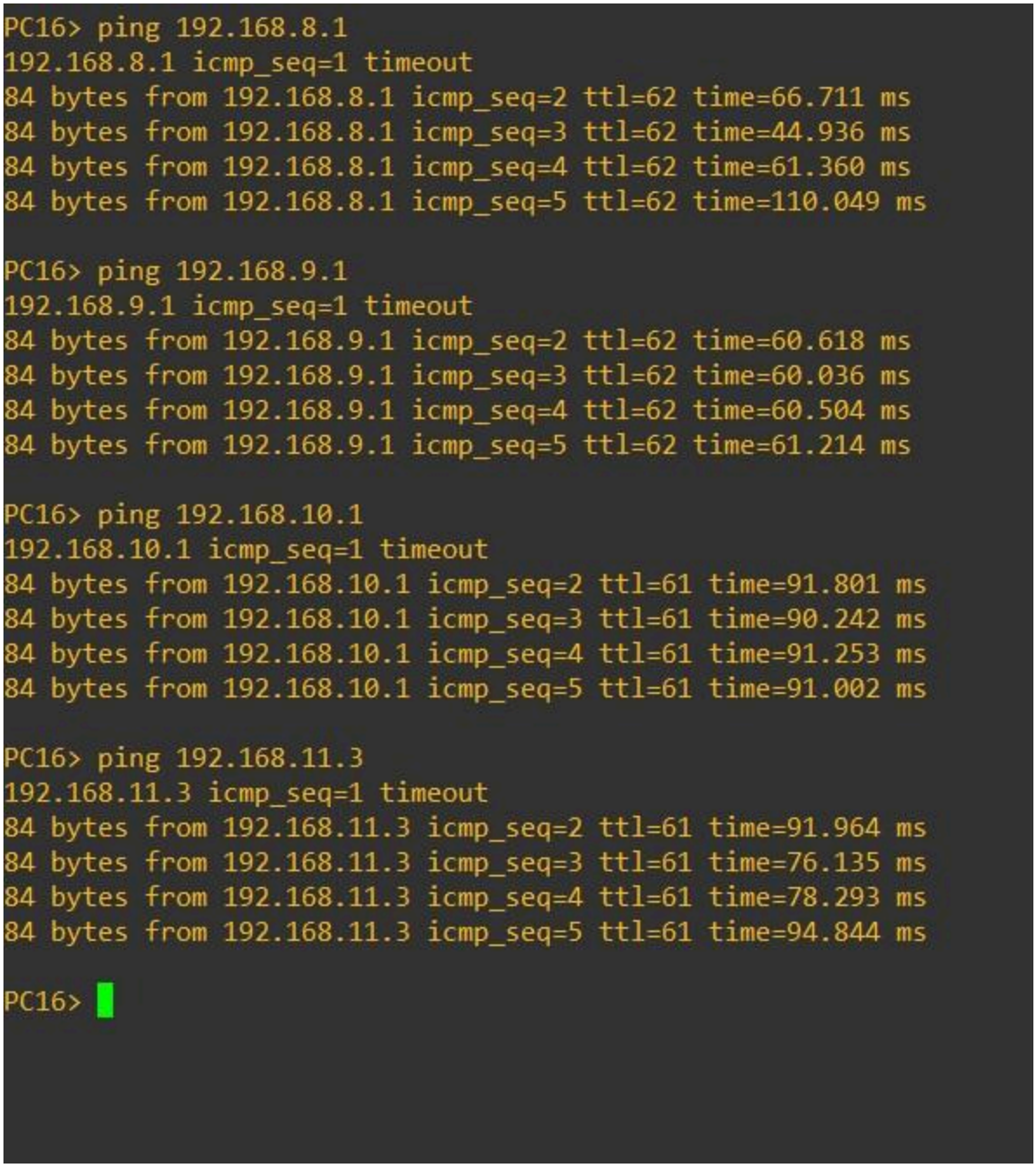

Image 2.8 : Pinging PC1 with other PC's.

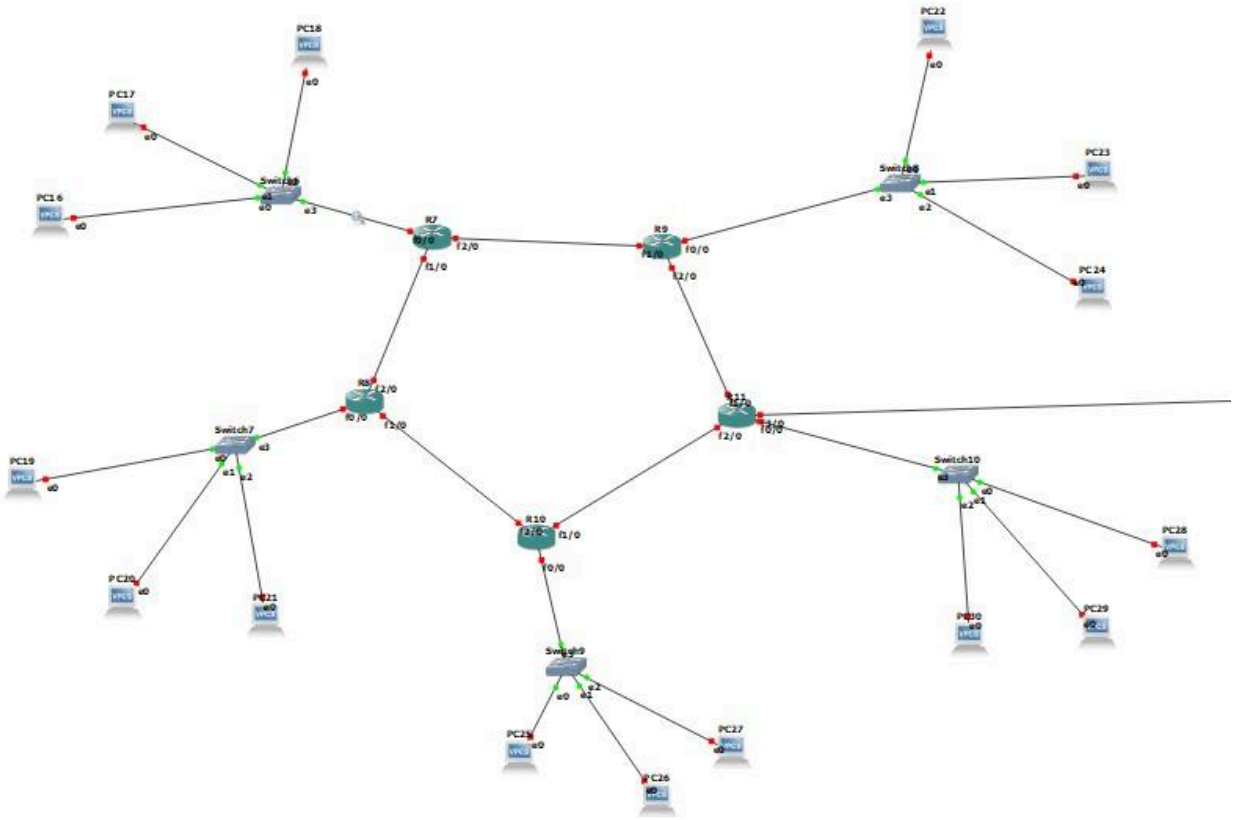

Image 2.9 : Starting the Wireshark connections.

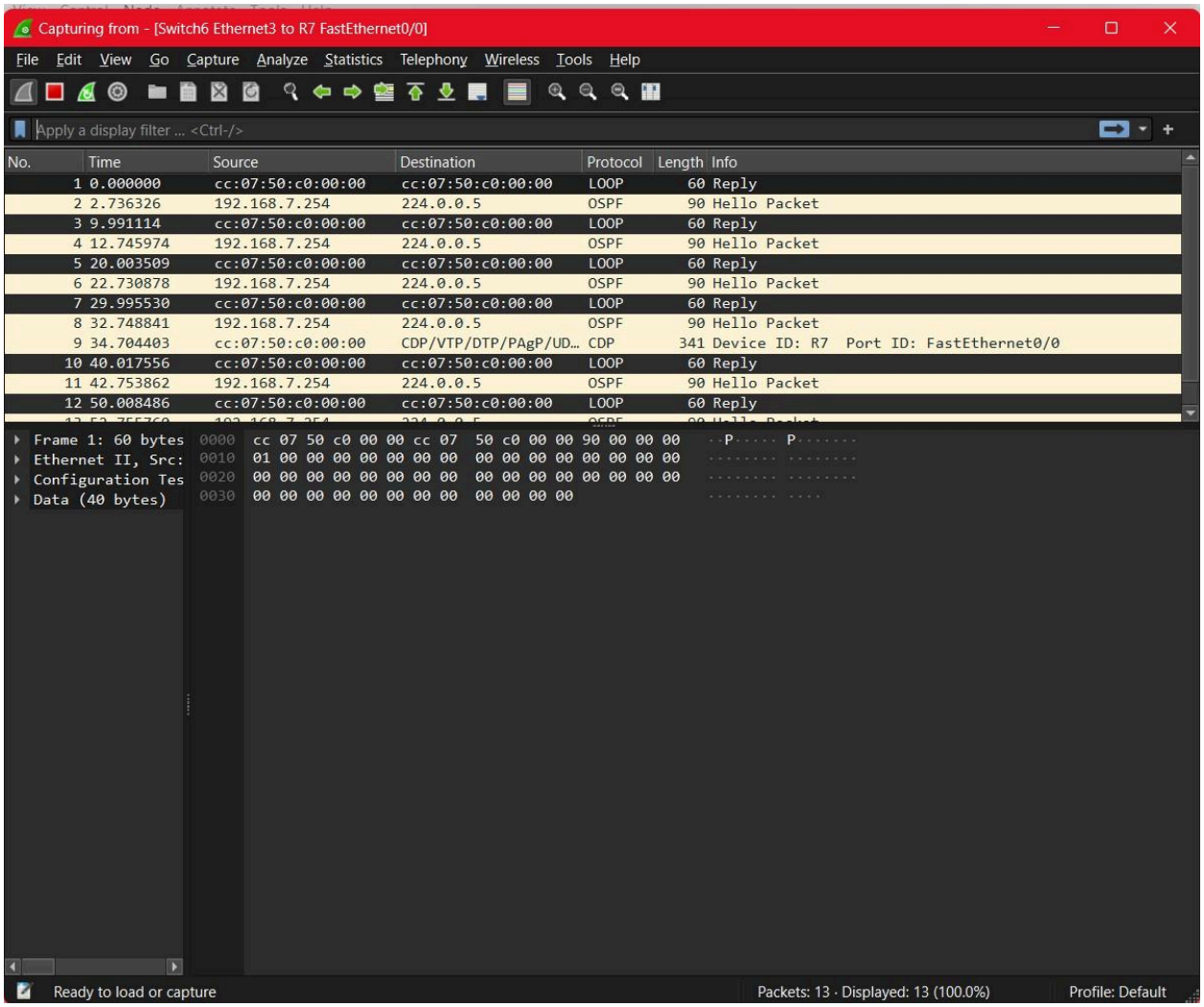

Image 2.10 : Checking the Wireshark.

BGP Border GateWay Protocol

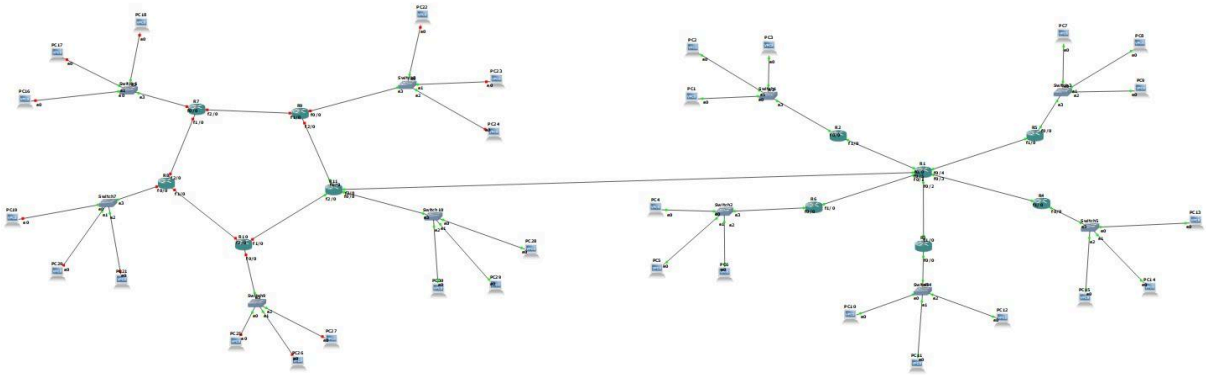

Image 3.1 : Connecting R11 from topology B and R1 from topology A.

For topology A, we have setted up using EIGRP .
For topology B, we have setted up using OSPF .

For setting up a BGP connection, set of IP addresses will be provided , 10.0.12.1 255.255.255.0 and 10.0.12.2 255.255.255.0 for R11 and R1 respectively.

EIGRP -> Enhanced Interior Gateway Routing Protocol
OSPF -> Open Shortest Path First

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#interface fastEthernet 0/5
R1(config-if)#no switchport
R1(config-if)#ip address
*Mar  1 00:02:16.483: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthern
et0/5, changed state to up
R1(config-if)#ip address 10.0.12.2 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#^Z
```

Image 3.2 : Setting up IP address for R1.

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#no router rip
R1(config)#router eigrp 1
R1(config-router)#network 10.0.1.2 255.255.255.0
R1(config-router)#network 10.0.2.2 255.255.255.0
R1(config-router)#network 10.0.3.2 255.255.255.0
R1(config-router)#network 10.0.4.2 255.255.255.0
R1(config-router)#network 10.0.5.2 255.255.255.0
R1(config-router)#network 10.0.12.2 255.255.255.0
R1(config-router)#^Z
```

Image 3.3 : Setting up Router EIGRP for R1.

```
R11#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R11(config)#interface fastEthernet 3/0
R11(config-if)#ip address 10.0.12.1 255.255.255.0
R11(config-if)#no shutdown
R11(config-if)#^Z
R11#
*Mar  1 00:16:01.971: %SYS-5-CONFIG_I: Configured from console by console
R11#
*Mar  1 00:16:03.083: %LINK-3-UPDOWN: Interface FastEthernet3/0, changed state t
o up
*Mar  1 00:16:04.083: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthern
et3/0, changed state to up
```

Image 3.4 : Setting up IP address for R11.

```
R11#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R11(config)#no router rip
R11(config)#router ospf 1
R11(config-router)#network 192.168.11.254 255.255.255.0 area 0
R11(config-router)#network 10.0.10.2 255.255.255.0 area 0
R11(config-router)#network 10.0.11.1 255.255.255.0 area 0
R11(config-router)#network 10.0.12.1 255.255.255.0 area 0
R11(config-router)#^Z
R11#
```

Image 3.5 : Setting up Router OSPF for R11.

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#router bgp 2
R1(config-router)#neig 10.0.12.1 remote-as 1
R1(config-router)#network 10.0.0.0 mask 255.255.255.0
R1(config-router)#redistribute eigrp 1
R1(config-router)#rouuter eigrp 1
                  ^
% Invalid input detected at '^' marker.

R1(config-router)#router eigrp 1
R1(config-router)#redistribute bgp 2 metric 10000 100 255 1 1500
R1(config-router)#^Z
R1#
```

```
R1#show ip bgp summary
BGP router identifier 10.0.12.2, local AS number 2
BGP table version is 11, main routing table version 11
10 network entries using 1170 bytes of memory
11 path entries using 572 bytes of memory
4/3 BGP path/bestpath attribute entries using 496 bytes of memory
1 BGP AS-PATH entries using 24 bytes of memory
0 BGP route-map cache entries using 0 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP using 2262 total bytes of memory
BGP activity 10/0 prefixes, 11/0 paths, scan interval 60 secs

Neighbor        V    AS MsgRcvd MsgSent   TblVer  InQ OutQ Up/Down  State/PfxRcd
10.0.12.1       4     1      65      66       11    0    0 01:01:50        4
R1#
```

Image 3.6 : Setting up BGP and showing the IP BGP summary for R1.

```
R11#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R11(config)#router bgp 1
R11(config-router)#neig 10.0.12.2 remote-as 2
R11(config-router)#network 10.0.0.0 mask 255.255.255.0
R11(config-router)#redistribute ospf 1
R11(config-router)#router ospf 1
R11(config-router)#redistribute bgp 1 subnets
R11(config-router)#^Z
```

```
R11#show ip bgp summary
BGP router identifier 192.168.11.254, local AS number 1
BGP table version is 11, main routing table version 11
10 network entries using 1170 bytes of memory
11 path entries using 572 bytes of memory
4/3 BGP path/bestpath attribute entries using 496 bytes of memory
1 BGP AS-PATH entries using 24 bytes of memory
0 BGP route-map cache entries using 0 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP using 2262 total bytes of memory
BGP activity 10/0 prefixes, 11/0 paths, scan interval 60 secs

Neighbor        V    AS MsgRcvd MsgSent   TblVer  InQ OutQ Up/Down  State/PfxRcd
10.0.12.2       4     2      67      66       11    0    0 01:02:00        7
R11#write
Building configuration...
[OK]
R11#
```

Image 3.7 : Setting up BGP and showing the IP BGP summary for R11.

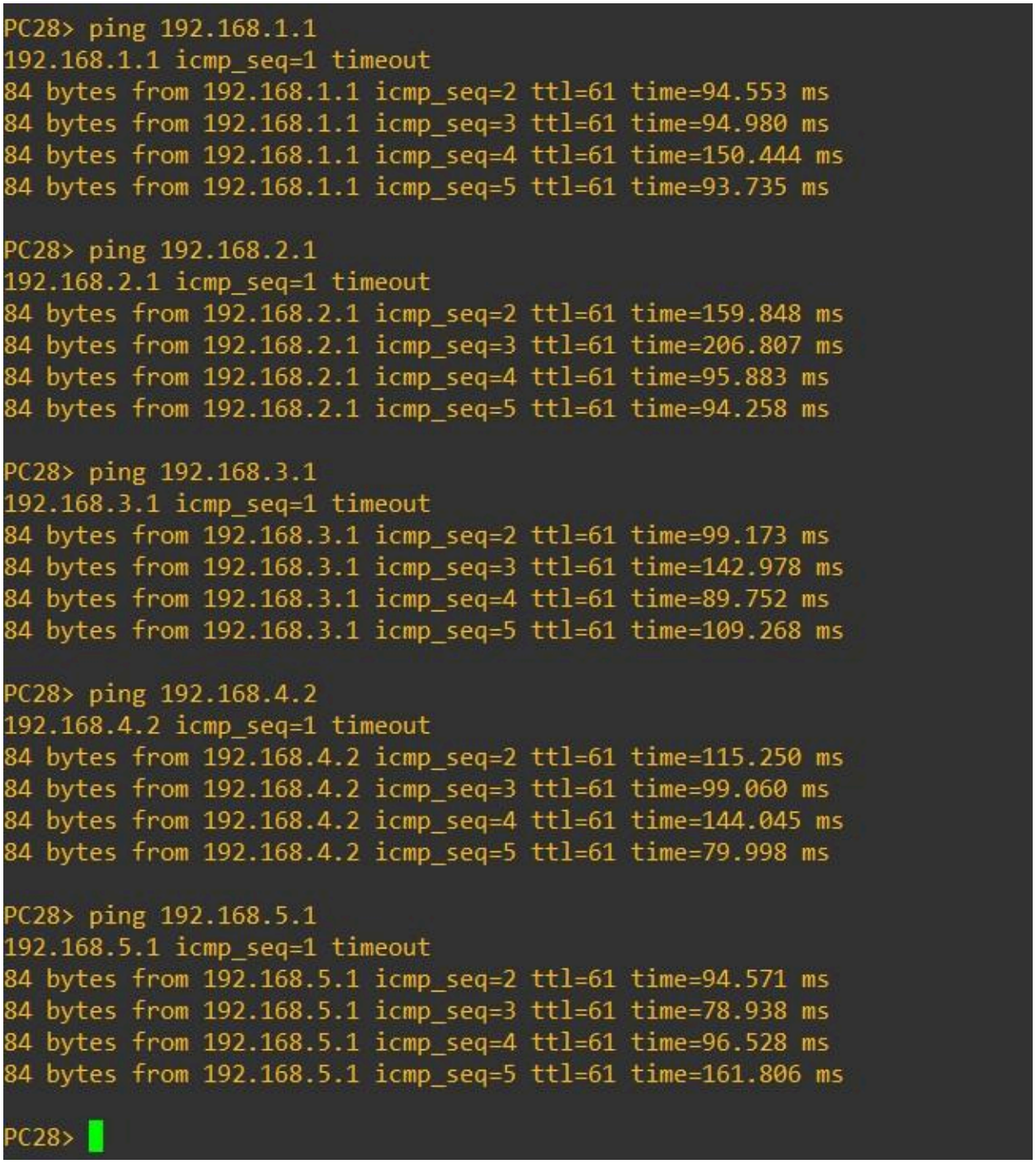

Image 3.8 : Pinging PC's from topology A to topology B.

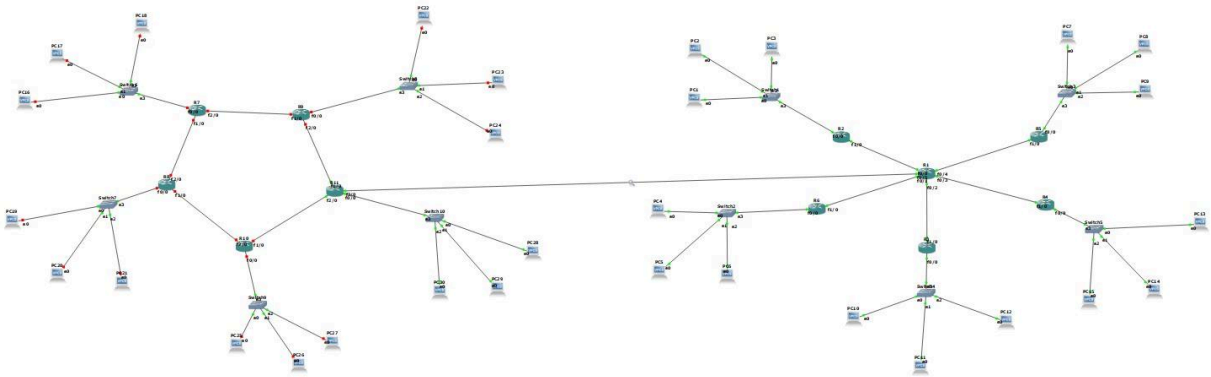

Image 3.9 : Setting up Wireshark between R11 and R1 routers.

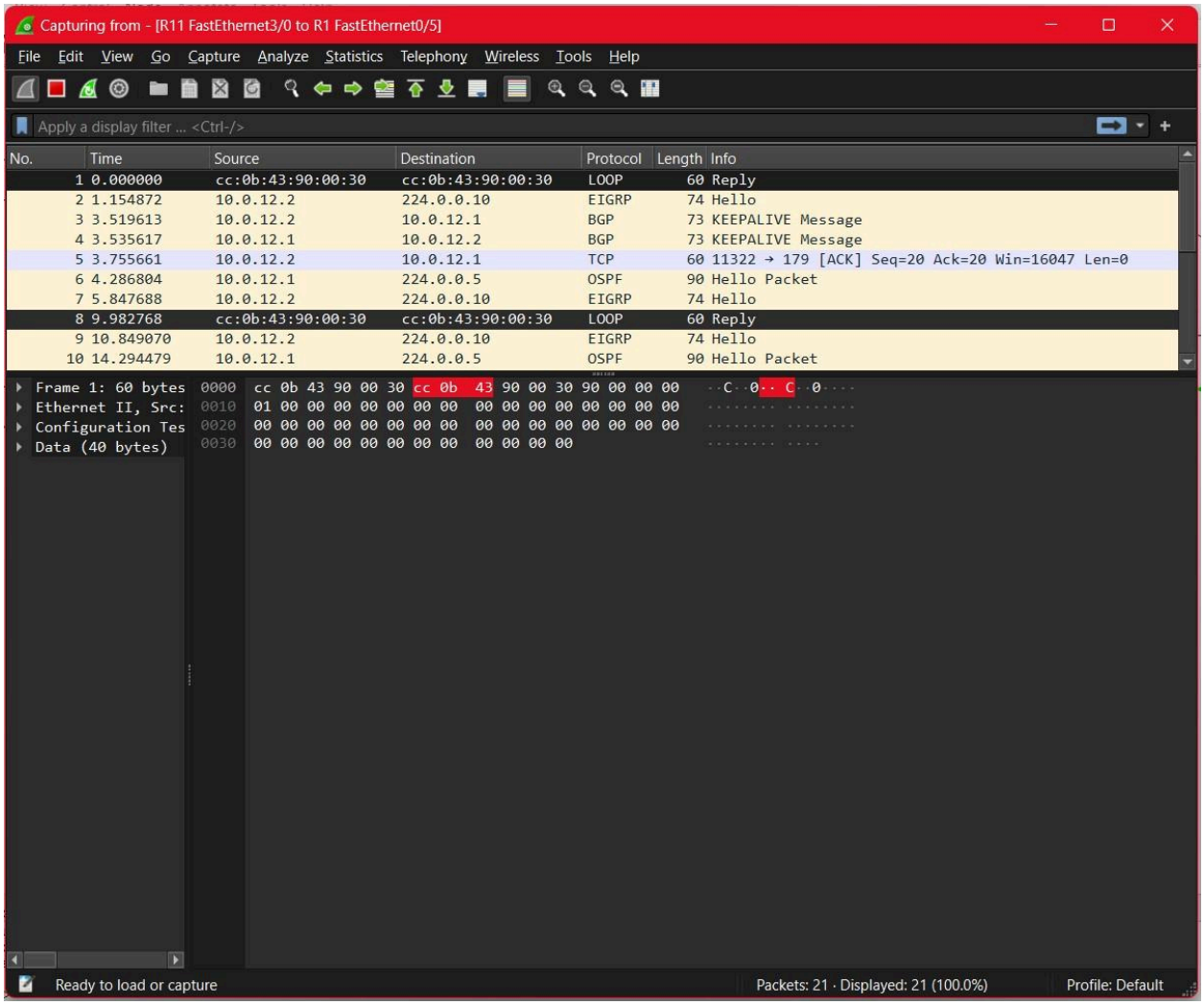

Image 3.10 : Checking the Wireshark.
