Tribhuvan University

Institute of Engineering

Pulchowk Campus

COMPUTER NETWORKS

Lab6
Dynamic Routing using RIP

SUBMITTED BY:

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075BCT028

Title
Dynamic Routing using RIP

Objectives

- To be familiar with dynamic routing

- To be familiar with configuration of dynamic routing using RIP

- To observe how the dynamic routing can address changing network topology automatically

Tools required

- A Computer

- Cisco Packet Tracer

Activities

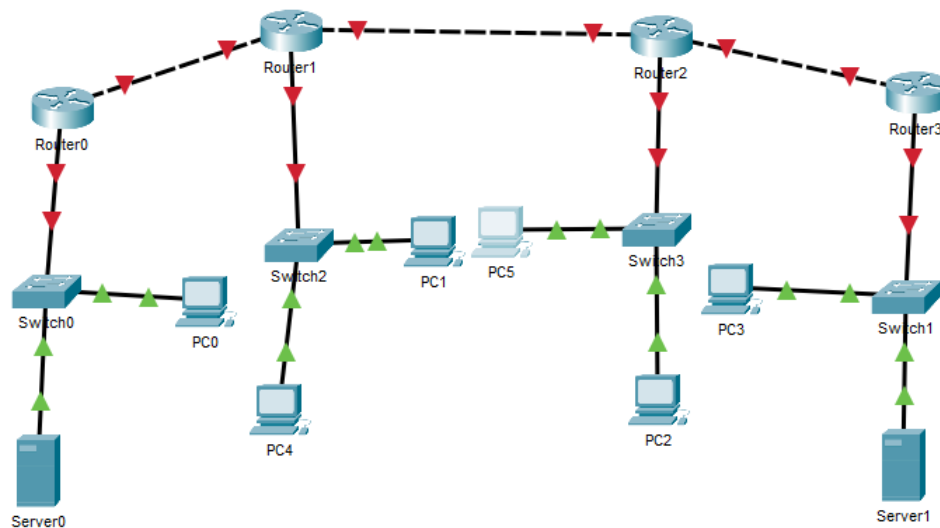A Following network topology was created in Packet Tracer.

Figure 1: Setup for Activity A

1 **The hostname, console password and enable password was configured in each router.**

```
Router(config)#hostname Bishal_0
Bishal_0(config)#line console 0
Bishal_0(config-line)#password cisco
Bishal_0(config-line)#login
Bishal_0(config-line)#exit
Bishal_0(config)#enable password class

Router(config)#hostname Bishal_1
Bishal_1(config)#line console 0
Bishal_1(config-line)#password cisco
Bishal_1(config-line)#login
Bishal_1(config-line)#exit
Bishal_1(config)#enable password class

Router(config)#hostname Bishal_2
Bishal_2(config)#line console 0
Bishal_2(config-line)#password cisco
Bishal_2(config-line)#login
Bishal_2(config-line)#exit
Bishal_2(config)#enable password class

Router(config)#hostname Bishal_3
Bishal_3(config)#line console 0
Bishal_3(config-line)#password cisco
Bishal_3(config-line)#login
Bishal_3(config-line)#exit
Bishal_3(config)#enable password class
```

2 **Telnet was enabled on each router with the password of cisco.**

```
Bishal_0(config)#line vty 0 4
Bishal_0(config-line)#password cisco
Bishal_0(config-line)#login
Bishal_0(config-line)#exit

Bishal_1(config)#line vty 0 4
Bishal_1(config-line)#password cisco
Bishal_1(config-line)#login
Bishal_1(config-line)#exit

Bishal_2(config)#line vty 0 4
Bishal_2(config-line)#password cisco
Bishal_2(config-line)#login
Bishal_2(config-line)#exit

Bishal_3(config)#line vty 0 4
Bishal_3(config-line)#password cisco
Bishal_3(config-line)#login
Bishal_3(config-line)#exit
```

3 **Each interface of the router was setup with given IP addresses**

- Router0: 202.60.0.1 and 202.60.1.1
- Router1: 202.60.1.2, 202.60.2.1 and 202.60.3.1
- Router2: 202.60.3.2, 202.60.4.1 and 202.60.5.1
- Router3: 202.60.5.2 and 202.60.6.1

4 **Each PC and server was setup with given IP addresses and default gateway**

- PC0: 202.60.0.2
- Server0 : 202.60.0.3
- PC1: 202.60.2.2
- PC4: 202.60.2.3
- PC2: 202.60.4.3
- PC5: 202.60.4.2
- PC3: 202.60.6.3
- Server1: 202.60.6.2

5 **The command show ip route was called in each router.**

- For Router0:
  ```
  Bishal_0#show ip route
  Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - E
         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 i
         * - candidate default, U - per-user static route, o - ODR
         P - periodic downloaded static route

  Gateway of last resort is not set

       202.60.0.0/24 is variably subnetted, 2 subnets, 2 masks
  C       202.60.0.0/24 is directly connected, GigabitEthernet0/0
  L       202.60.0.1/32 is directly connected, GigabitEthernet0/0
          202.60.1.0/24 is variably subnetted, 2 subnets, 2 masks
  C       202.60.1.0/24 is directly connected, GigabitEthernet0/1
  L       202.60.1.1/32 is directly connected, GigabitEthernet0/1
  ```

- For Router1:
  ```
  Bishal_1#show ip route
  Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - E
         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 i
  ```

3

```
                 * - candidate default, U - per-user static route, o - ODR
                 P - periodic downloaded static route

     Gateway of last resort is not set

                 202.60.1.0/24 is variably subnetted, 2 subnets, 2 masks
     C           202.60.1.0/24 is directly connected, GigabitEthernet0/1
     L           202.60.1.2/32 is directly connected, GigabitEthernet0/1
                 202.60.2.0/24 is variably subnetted, 2 subnets, 2 masks
     C           202.60.2.0/24 is directly connected, GigabitEthernet0/0
     L           202.60.2.1/32 is directly connected, GigabitEthernet0/0
                 202.60.3.0/24 is variably subnetted, 2 subnets, 2 masks
     C           202.60.3.0/24 is directly connected, GigabitEthernet0/2
     L           202.60.3.1/32 is directly connected, GigabitEthernet0/2
```

- For Router2:

```
Bishal_2#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - F
       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 in
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     202.60.3.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.3.0/24 is directly connected, GigabitEthernet0/1
L       202.60.3.2/32 is directly connected, GigabitEthernet0/1
     202.60.4.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.4.0/24 is directly connected, GigabitEthernet0/0
L       202.60.4.1/32 is directly connected, GigabitEthernet0/0
     202.60.5.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.60.5.0/24 is directly connected, GigabitEthernet0/2
L       202.60.5.1/32 is directly connected, GigabitEthernet0/2
```

- For Router3:

```
Bishal_3#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - F
       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 in
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set
```

```
            202.60.5.0/24 is variably subnetted, 2 subnets, 2 masks
    C          202.60.5.0/24 is directly connected, GigabitEthernet0/1
    L          202.60.5.2/32 is directly connected, GigabitEthernet0/1
            202.60.6.0/24 is variably subnetted, 2 subnets, 2 masks
    C          202.60.6.0/24 is directly connected, GigabitEthernet0/0
    L          202.60.6.1/32 is directly connected, GigabitEthernet0/0
```

6 **Ping command was used from PC0 to Server0, Server1, PC0, PC1,PC2, PC3, Router0, Router1, Router2 and Router3.**
Ping was successful from PC0 to Server0 and Router0's 202.60.0.1 interface only.

7 **Ping command was used from PC1 to Server0, Server1, PC0, PC1,PC2, PC3, Router0, Router1, Router2 and Router3.**
Ping was successful from PC1 to PC4 and Router1's 202.60.2.1 interface only.

8 **Ping command was used from other PCs to Server0, Server1, PC0, PC1,PC2, PC3, Router0, Router1, Router2 and Router3.**
Ping was successful only if source and destination were in same network.

9 **Router0 was entered from PC0 using telnet and RIP was configured.**


```
Cisco Packet Tracer PC Command Line 1.0
C:\>telnet 202.60.0.1
Trying 202.60.0.1 ...Open


User Access Verification

Password:
Bishal_0>en
Password:
Bishal_0#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Bishal_0(config)#router rip
Bishal_0(config-router)#network 202.60.0.0
Bishal_0(config-router)#network 202.60.1.0
Bishal_0(config-router)#exit
Bishal_0(config)#
```

Figure 2: Telnet to router 0

10 **Router1 was entered from Step9 using telnet and RIP was configured.**

Figure 3: Telnet to router 1

11 **Router2 and Router3 were entered from Step10 using telnet and RIP was configured.**

Figure 4: Telnet to router 2 and 3

12 **Step 5 to 8 were repeated.**

Pings to and from each PC, server and routers were possible.

For show ip route:

- Router0:

```
Bishal_0#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - E
       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 in
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

      202.60.0.0/24 is variably subnetted, 2 subnets, 2 masks
C        202.60.0.0/24 is directly connected, GigabitEthernet0/0
L        202.60.0.1/32 is directly connected, GigabitEthernet0/0
      202.60.1.0/24 is variably subnetted, 2 subnets, 2 masks
C        202.60.1.0/24 is directly connected, GigabitEthernet0/1
L        202.60.1.1/32 is directly connected, GigabitEthernet0/1
R     202.60.2.0/24 [120/1] via 202.60.1.2, 00:00:09, GigabitEthernet0/1
R     202.60.3.0/24 [120/1] via 202.60.1.2, 00:00:09, GigabitEthernet0/1
R     202.60.4.0/24 [120/2] via 202.60.1.2, 00:00:09, GigabitEthernet0/1
R     202.60.5.0/24 [120/2] via 202.60.1.2, 00:00:09, GigabitEthernet0/1
R     202.60.6.0/24 [120/3] via 202.60.1.2, 00:00:09, GigabitEthernet0/1
```

- Router1:

```
Bishal_1#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - E
       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 in
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

R     202.60.0.0/24 [120/1] via 202.60.1.1, 00:00:27, GigabitEthernet0/1
      202.60.1.0/24 is variably subnetted, 2 subnets, 2 masks
C        202.60.1.0/24 is directly connected, GigabitEthernet0/1
L        202.60.1.2/32 is directly connected, GigabitEthernet0/1
      202.60.2.0/24 is variably subnetted, 2 subnets, 2 masks
C        202.60.2.0/24 is directly connected, GigabitEthernet0/0
L        202.60.2.1/32 is directly connected, GigabitEthernet0/0
      202.60.3.0/24 is variably subnetted, 2 subnets, 2 masks
C        202.60.3.0/24 is directly connected, GigabitEthernet0/2
L        202.60.3.1/32 is directly connected, GigabitEthernet0/2
R     202.60.4.0/24 [120/1] via 202.60.3.2, 00:00:21, GigabitEthernet0/2
R     202.60.5.0/24 [120/1] via 202.60.3.2, 00:00:21, GigabitEthernet0/2
```

- Router2:

```
Bishal_2#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - B
       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 in
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

R     202.60.0.0/24 [120/2] via 202.60.3.1, 00:00:18, GigabitEthernet0/1
R     202.60.1.0/24 [120/1] via 202.60.3.1, 00:00:18, GigabitEthernet0/1
R     202.60.2.0/24 [120/1] via 202.60.3.1, 00:00:18, GigabitEthernet0/1
      202.60.3.0/24 is variably subnetted, 2 subnets, 2 masks
C        202.60.3.0/24 is directly connected, GigabitEthernet0/1
L        202.60.3.2/32 is directly connected, GigabitEthernet0/1
      202.60.4.0/24 is variably subnetted, 2 subnets, 2 masks
C        202.60.4.0/24 is directly connected, GigabitEthernet0/0
L        202.60.4.1/32 is directly connected, GigabitEthernet0/0
      202.60.5.0/24 is variably subnetted, 2 subnets, 2 masks
C        202.60.5.0/24 is directly connected, GigabitEthernet0/2
L        202.60.5.1/32 is directly connected, GigabitEthernet0/2
```

- Router3:

```
Bishal_3#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - B
       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 i
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

R     202.60.0.0/24 [120/3] via 202.60.5.1, 00:00:17, GigabitEthernet0/1
R     202.60.1.0/24 [120/2] via 202.60.5.1, 00:00:17, GigabitEthernet0/1
R     202.60.2.0/24 [120/2] via 202.60.5.1, 00:00:17, GigabitEthernet0/1
R     202.60.3.0/24 [120/1] via 202.60.5.1, 00:00:17, GigabitEthernet0/1
R     202.60.4.0/24 [120/1] via 202.60.5.1, 00:00:17, GigabitEthernet0/1
      202.60.5.0/24 is variably subnetted, 2 subnets, 2 masks
C        202.60.5.0/24 is directly connected, GigabitEthernet0/1
L        202.60.5.2/32 is directly connected, GigabitEthernet0/1
      202.60.6.0/24 is variably subnetted, 2 subnets, 2 masks
C        202.60.6.0/24 is directly connected, GigabitEthernet0/0
L        202.60.6.1/32 is directly connected, GigabitEthernet0/0
```

13 **"tracert" command was used to observe the output from each PC to all other PCs.**
The route with fewest hops was returned in each case.

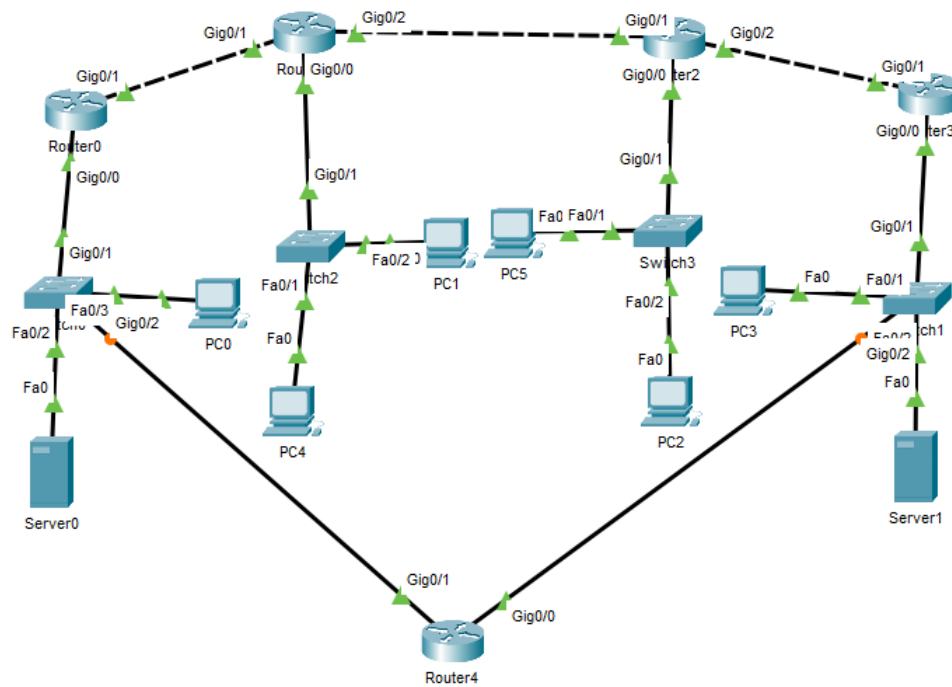B Following network topology was created in Packet Tracer.

Figure 5: Setup for Activity B

1 **"show ip route" was called from each router and the result was compared to that of Activity A.**
The RIP configuration only showed the networks that were not directly connected. Thus Router0 and Router3 has fewer dynamic connections.

2 **"tracert" was used from each PC to another PC and result was observed.**
Addition of router 4 was automatically adjusted. For example the tracert from PC0 to PC3 or vice versa used Router4 as path as it had fewer hops.

3 **Connection between Router0 and Router1 was removed.**
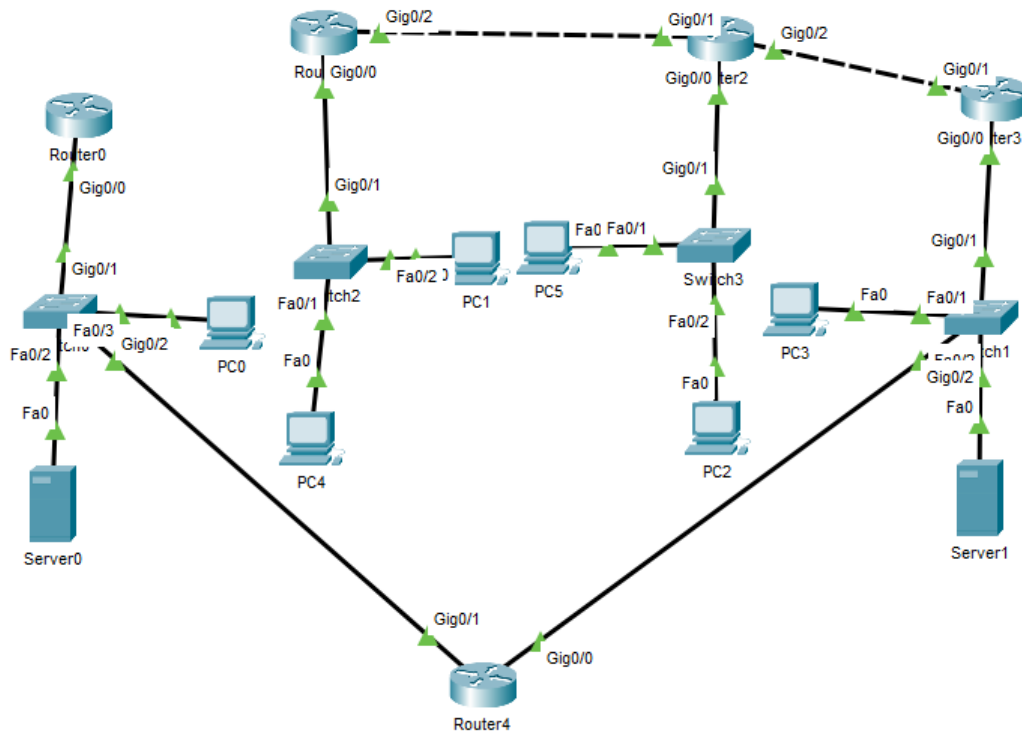Thr "tracert" command showed that packets were automatically using the

Figure 6: Updated setup for Activity B

new route. Also, the "show ip route" showed that the connection between Router0 and Router1 which was previously direct was now replaced by RIP.

4 **Step 3 was observed but for various links.**
Same results were obtained. "ping" and "tracert" auto updated. And "show ip route" for routers changed the connection of removed link from direct to RIP.

5 **The changing network topology being automaticallly addressed by dynamic routing protocol to determine the optimal path to reach each of the destination networks was noted.**
The routing tables are updated in such a way that the hop count required to reach the destination is minimized in case of multiple paths to destination.

C Following network topology was created in Packet Tracer.
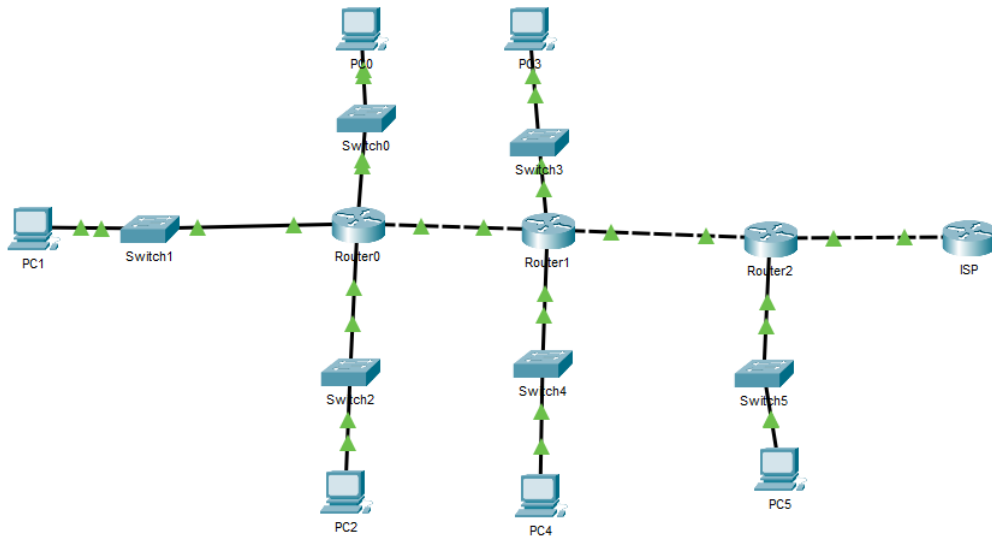For this, given IP of 222.22.22.0/23 was divided as :

Figure 7: Setup for Activity C

Network	Hosts	Nearest power of 2	Subnet Mask	Network address	Broadcast Address
B	70	128	255.255.255.128	222.22.22.0	222.22.22.127
D	60	64	255.255.255.192	222.22.22.128	222.22.22.191
C	50	64	255.255.255.192	222.22.22.192	222.22.22.255
A	40	64	255.255.255.192	222.22.23.0	222.22.23.63
F	20	32	255.255.255.224	222.22.23.64	222.22.23.95
E	10	16	255.255.255.240	222.22.23.96	222.22.23.111
G	2	4	255.255.255.252	222.22.23.112	222.22.23.115
H	2	4	255.255.255.252	222.22.23.116	222.22.23.119
I	2	4	255.255.255.252	222.22.23.120	222.22.23.123

1 **Above network topology was created in Packet Tracer.**

2 **Hostname, consle password, enable password and telnet password was configured for each router.**

3 **Appropriate IP address, subnet mask and Default gateway was configured for each router.**

4 **"show ip route" was run from each router.**

- For Router0:

    Gateway of last resort is not set

```
      222.22.22.0/24 is variably subnetted, 3 subnets, 3 masks
C        222.22.22.0/25 is directly connected, FastEthernet2/0
C        222.22.22.192/26 is directly connected, FastEthernet3/0
      222.22.23.0/24 is variably subnetted, 6 subnets, 4 masks
C        222.22.23.0/26 is directly connected, FastEthernet1/0
C        222.22.23.112/30 is directly connected, FastEthernet0/0
```

- For Router1:

```
      222.22.22.0/24 is variably subnetted, 2 subnets, 2 masks
C        222.22.22.128/26 is directly connected, FastEthernet3/0
      222.22.23.0/24 is variably subnetted, 6 subnets, 4 masks
C        222.22.23.96/28 is directly connected, FastEthernet2/0
C        222.22.23.112/30 is directly connected, FastEthernet0/0
C        222.22.23.116/30 is directly connected, FastEthernet1/0
```

- For Router2:

```
      222.22.23.0/24 is variably subnetted, 6 subnets, 4 masks
C        222.22.23.64/27 is directly connected, FastEthernet2/0
C        222.22.23.116/30 is directly connected, FastEthernet0/0
C        222.22.23.120/30 is directly connected, FastEthernet1/0
```

- For ISP router:

```
      222.22.23.0/24 is variably subnetted, 6 subnets, 4 masks
C        222.22.23.120/30 is directly connected, FastEthernet0/0
```

5 **RIP version2 was configured in all routers for dynamic routing.**

6 **"show ip route" was run from each router.**

- For Router0:

```
      222.22.22.0/24 is variably subnetted, 3 subnets, 3 masks
R        222.22.22.0/24 [120/1] via 222.22.23.114, 00:00:12, FastEtherne
C        222.22.22.0/25 is directly connected, FastEthernet2/0
C        222.22.22.192/26 is directly connected, FastEthernet3/0
       222.22.23.0/24 is variably subnetted, 6 subnets, 4 masks
C        222.22.23.0/26 is directly connected, FastEthernet1/0
R        222.22.23.64/27 [120/2] via 222.22.23.114, 00:00:12, FastEtherr
R        222.22.23.96/28 [120/1] via 222.22.23.114, 00:00:12, FastEtherr
C        222.22.23.112/30 is directly connected, FastEthernet0/0
R        222.22.23.116/30 [120/1] via 222.22.23.114, 00:00:12, FastEther
R        222.22.23.120/30 [120/2] via 222.22.23.114, 00:00:12, FastEther
```

- For Router1:

```
      222.22.22.0/24 is variably subnetted, 2 subnets, 2 masks
R        222.22.22.0/24 [120/1] via 222.22.23.113, 00:00:25, FastEtherne
C        222.22.22.128/26 is directly connected, FastEthernet3/0
```

```
        222.22.23.0/24 is variably subnetted, 6 subnets, 4 masks
R        222.22.23.0/26 [120/1] via 222.22.23.113, 00:00:25, FastEtherne
R        222.22.23.64/27 [120/1] via 222.22.23.118, 00:00:01, FastEtherr
C        222.22.23.96/28 is directly connected, FastEthernet2/0
C        222.22.23.112/30 is directly connected, FastEthernet0/0
C        222.22.23.116/30 is directly connected, FastEthernet1/0
R        222.22.23.120/30 [120/1] via 222.22.23.118, 00:00:01, FastEtherr
```

- For Router2:

```
R        222.22.22.0/24 [120/1] via 222.22.23.117, 00:00:27, FastEtherne
        222.22.23.0/24 is variably subnetted, 6 subnets, 4 masks
R        222.22.23.0/26 [120/2] via 222.22.23.117, 00:00:27, FastEtherne
C        222.22.23.64/27 is directly connected, FastEthernet2/0
R        222.22.23.96/28 [120/1] via 222.22.23.117, 00:00:27, FastEtherr
R        222.22.23.112/30 [120/1] via 222.22.23.117, 00:00:27, FastEther
C        222.22.23.116/30 is directly connected, FastEthernet0/0
C        222.22.23.120/30 is directly connected, FastEthernet1/0
```

- For ISP router:
```
R     222.22.22.0/24 [120/2] via 222.22.23.121, 00:00:18, FastEthernet0/
        222.22.23.0/24 is variably subnetted, 6 subnets, 4 masks
R        222.22.23.0/26 [120/3] via 222.22.23.121, 00:00:18, FastEtherne
R        222.22.23.64/27 [120/1] via 222.22.23.121, 00:00:18, FastEtherr
R        222.22.23.96/28 [120/2] via 222.22.23.121, 00:00:18, FastEtherr
R        222.22.23.112/30 [120/2] via 222.22.23.121, 00:00:18, FastEther
R        222.22.23.116/30 [120/1] via 222.22.23.121, 00:00:18, FastEther
C        222.22.23.120/30 is directly connected, FastEthernet0/0
```

7 **Connectivity among computers were checked.**
Pings to and from all PCs were successful.

8 **"traceroute" was called from PC0 to all PCs and routers.** Since
the pings were successful, all tracerts should also be successful. Some of
the tracert results are:

Figure 8: tracert to other PCs from PC0

9 "traceroute" was called from PC0 to other PCs

Figure 9: tracert to 1.1.1.1

10 The default route in each router was set to ISP router.

```
ip route 0.0.0.0 0.0.0.0 222.22.23.122
```
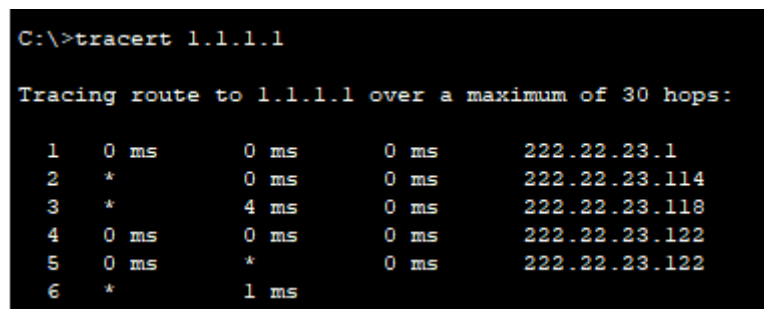
11 "show ip route" was run from each router.

The results were similar to Step 6 but gateway of last resort was obtained as ISP router. Also, the router was also available as candidate default static connection. For example, for Router0:

```
      Gateway of last resort is 222.22.23.122 to network 0.0.0.0

        222.22.22.0/24 is variably subnetted, 3 subnets, 3 masks
    R      222.22.22.0/24 [120/1] via 222.22.23.114, 00:00:23, FastEthernet0/
    C      222.22.22.0/25 is directly connected, FastEthernet2/0
    C      222.22.22.192/26 is directly connected, FastEthernet3/0
        222.22.23.0/24 is variably subnetted, 6 subnets, 4 masks
    C      222.22.23.0/26 is directly connected, FastEthernet1/0
    R      222.22.23.64/27 [120/2] via 222.22.23.114, 00:00:23, FastEthernet0
    R      222.22.23.96/28 [120/1] via 222.22.23.114, 00:00:23, FastEthernet0
    C      222.22.23.112/30 is directly connected, FastEthernet0/0
    R      222.22.23.116/30 [120/1] via 222.22.23.114, 00:00:23, FastEthernet
    R      222.22.23.120/30 [120/2] via 222.22.23.114, 00:00:23, FastEthernet
    S*  0.0.0.0/0 [1/0] via 222.22.23.122
```

12 **"traceroute" was called from PC0 to 1.1.1.1**
The packet reahes default route ie. ISP router but cannot move any

Figure 10: tracert to 1.1.1.1 after default route

forward.

Conclusion
In this way "Lab6:Dynamic Routing using RIP" was completed after studying about
dynamic routing and implementing RIP commands in Cisco Packet Tracer.

Exercises

1 **What is dynamic routing? How does it differ with static routing?**
Explain briefly.
Dynamic routing is a adaptive routing process in which packets move towards
a destination via different routes based on the current condition of circuit. In
another words, it is a routing method with multiple paths such that it can
always reach destination in spite of route damage or node loss as long as al-
ternate routes are available.
The difference between static and dynamic routing are:

SN	Parameter	Static Routing	Dynamic Routing
1	Route	User-Defined and Manual	Topology dependent and Automatic
2	Routing Algorithms	Simple	Complex
3	Security	High	Low
4	Applied in	Small Networks	Large Networks
5	Bandwidth requirement	Less	More
6	Configuration	Easy	Difficult

2 **List out the dynamic routing configuration commands of the router (that you have used in this lab) for RIP as well as RIP version 2 with the syntax and examples.**

The dynamic routing configuration commands are as follows:

- For version 1:

```
Router ( config )# router rip
Router ( config - router )# network [ network - number ]
Example:
Router ( config )# router rip
Router ( config - router )# network 202.60.0.0
Router ( config - router )# network 202.60.1.0
```

- For version 2:

```
Router ( config )# router rip
Router ( config - router )# version 2
Router ( config - router )# network [ network - number ]
Example
Router ( config )# router rip
Router ( config - router )# version 2
Router ( config - router )# network 202.60.0.0
Router ( config - router )# network 202.60.1.0
```

3 **How can dynamic routing address the changing topology of a network automatically? Explain with reference to the observation of your lab exercise.**

RIP (Routing Information Protocol) is a dynamic routing protocol that uses hop count as a routing metrics to find the optimal path between source and destination. In CISCO Routers, RIP uses a 30-second update interval by default which means it updates the routing table after each 30 seconds if new information is present. They also send the routing tables to neighbour routers on each some interval of time and vice versa. Whenever a Router finds a path is disconnected or broken using the hop counts, it updates its routing table and sends to its neighbour. This process is followed until all the network is not converged. In the lab, when we disconnected a path, the routing table

is updated after 30 seconds and transmitted through the network. Thus, all routers adjusted the routing paths according to the optimal hop counts.

4 **Note down the observation of each step with necessary commands specified in activities A, B and C mentioned above and comment on the result by explaining the reason in detail.**
Refer to the activity section in lab report.