Lab 7: Configuring RIP Version 1 (RIPv1) on Cisco Packet Tracer

Objective:

To configure RIPv1 on two routers (R1 and R2) connected to separate local area networks (LANs) using switches and PCs. The goal is to enable communication between devices on LAN1 (192.168.5.0/24) and LAN2 (192.168.10.0/24) through RIPv1 routing.

Network Topology Setup:

- Devices:
  - 2 Routers: Cisco Router 1941 (R1 and R2)
  - 2 Switches: Cisco Switch 2960 (SW1 and SW2)
  - 4 PCs: PC1 and PC2 connected to SW1, PC3 and PC4 connected to SW2
- Cabling:
  - Connect the routers (R1 and R2) via a Serial DCE-DTE cable on Serial0/1/0 (R1) to Serial0/1/1 (R2).
  - Connect the GigabitEthernet ports of R1 and R2 to their respective switches (SW1 and SW2) using straight-through cables.
  - Connect PCs to switches:
    - PC1 and PC2 to SW1 (connected to R1)
    - PC3 and PC4 to SW2 (connected to R2)

Step 1: Configuring IP Addresses on R1 and R2

Router R1:

1. Configuring Serial0/1/0 on R1:

   R1#conf t
2. R1(config)#interface serial 0/1/0
3. R1(config-if)#ip address 10.1.1.1 255.255.255.0
4. R1(config-if)#no shutdown

5. Configuring GigabitEthernet 0/1 on R1:
   R1#conf t
6. R1(config)#interface gigabitethernet 0/1
7. R1(config-if)#ip address 192.168.5.1 255.255.255.0
8. R1(config-if)#no shutdownRouter R2:

9. Configuring Serial0/1/1 on R2:
   R2#conf t
10. R2(config)#interface serial 0/1/1
11. R2(config-if)#ip address 10.1.1.2 255.255.255.0
12. R2(config-if)#no shutdown
13. Configuring GigabitEthernet 0/1 on R2:
   R2#conf t
14. R2(config)#interface gigabitethernet 0/1
15. R2(config-if)#ip address 192.168.10.1 255.255.255.0
16. R2(config-if)#no shutdown

Step 2: Testing IP Connectivity Before RIP Configuration

After assigning IP addresses to the interfaces on R1 and R2:

- Ping from PC1 to R1's GigabitEthernet and Serial IPs should work, as PC1 and PC2 are on the same network as Router R1.
- Ping from PC1 to R2's interfaces will fail at this stage, as R1 and R2 are not yet sharing routing information.

Step 3: Configuring RIP Version 1 (RIPv1) on Routers

Router R1:

1. Enable RIP and Add Networks:
   R1#conf t
2. R1(config)#router rip
3. R1(config-router)#network 192.168.5.0
4. R1(config-router)#network 10.1.1.0
5. R1(config-router)#exit
6. R1(config)#wr

Router R2:

1. Enable RIP and Add Networks:
   R2#conf t
2. R2(config)#router rip
3. R2(config-router)#network 192.168.10.0
4. R2(config-router)#network 10.1.1.0

5. R2(config-router)#exit
6. R2(config)#wr

Step 4: Verifying RIP Configuration

After configuring RIP, routers R1 and R2 should now be able to exchange routing information. The following commands help verify RIP's functionality.

1. Ping Test

- Test the Connection: Now, attempt to ping devices across LANs.
  - Ping from PC1 (192.168.5.2) to PC3 (192.168.10.2) and PC4 (192.168.10.3).
  - If the RIP configuration is correct, the ping should succeed, indicating successful communication between LAN1 and LAN2.

2. Show Commands for RIP Verification

1. Check Routing Table with show ip route:

   R1#show ip route
   Explanation:

   - The entry for RIPv1 will be marked with an "R."
   - You should see the network 192.168.10.0/24 (LAN2) learned via RIP.

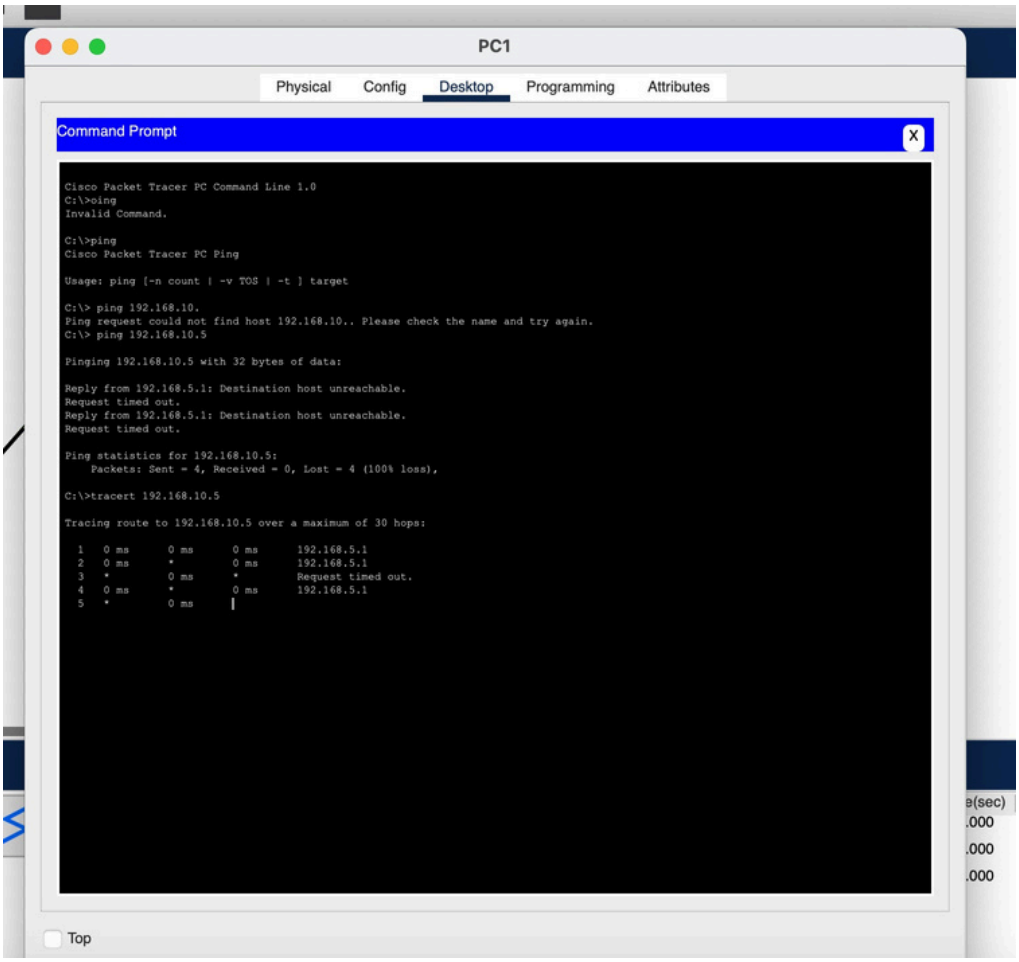
2. Check RIP Routes with show ip rip database:

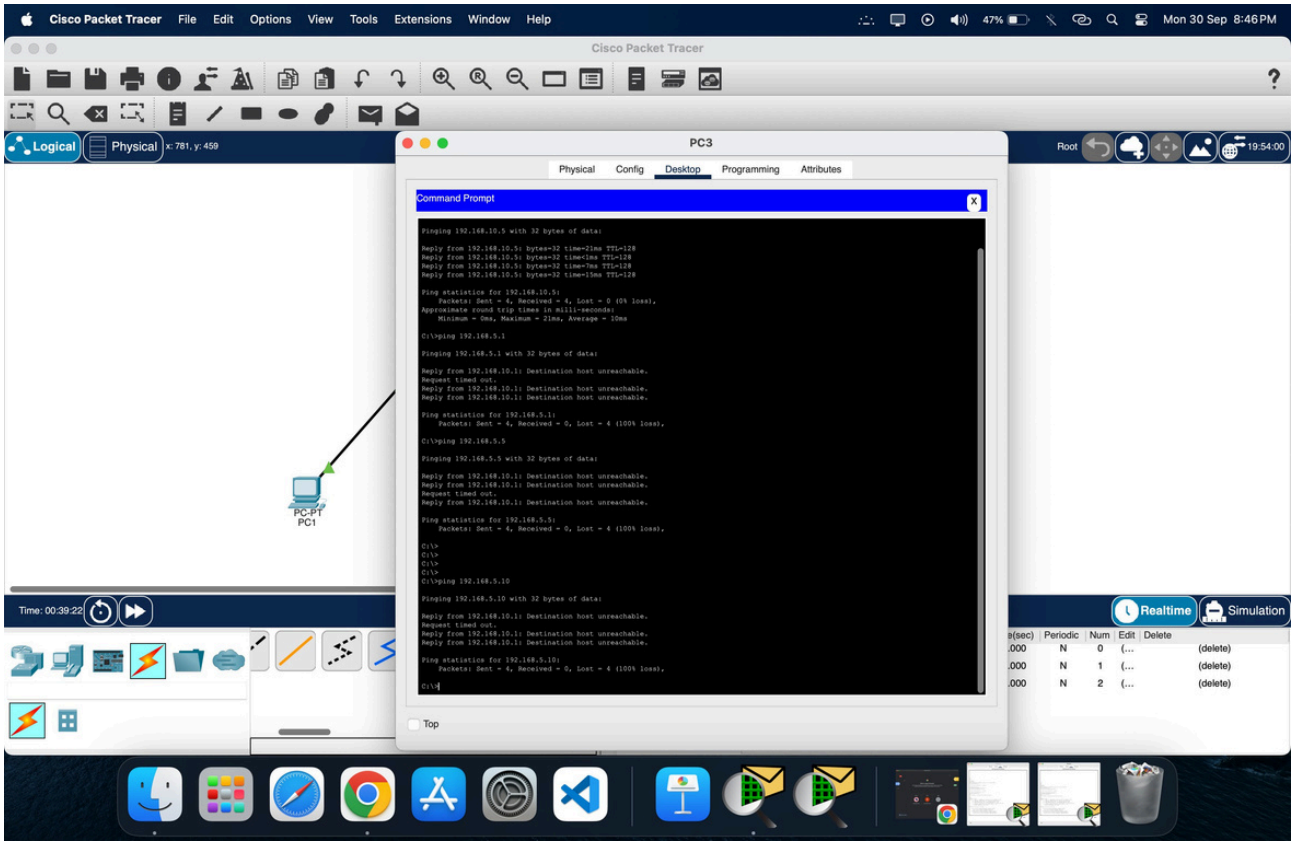
   R1#show ip rip database
   Explanation: This command provides detailed RIP routes, showing the learned routes via RIP.

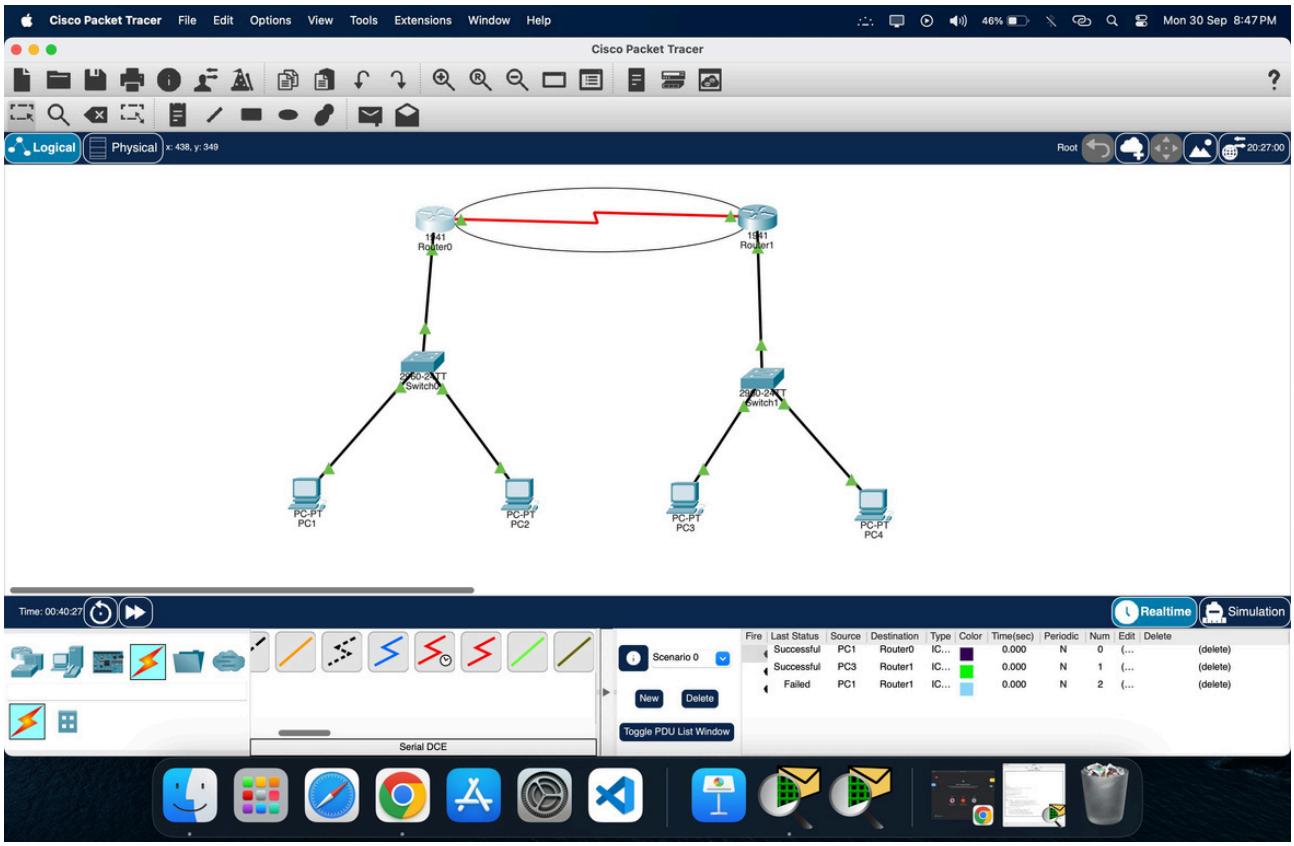
Observation Summary:

- IP Address Configuration: Successfully assigned IPs to the GigabitEthernet and Serial interfaces of R1 and R2.
- Connectivity Before RIP: Pings between PCs on the same LAN worked, but inter-LAN communication (PC1 to PC3) failed as routing was not yet enabled.
- RIP Configuration: After enabling RIPv1 on both routers and adding the respective networks 192.168.5.0, 192.168.10.0, and 10.1.1.0), the routers began exchanging routing information. Connectivity After RIP: Once RIP was configured, inter-LAN pings succeeded, demonstrating that the routers shared their routes correctly.
- Verification: The show ip route, show ip protocols, and show running-config
- commands confirmed that RIP was functioning properly, with routes being dynamically learned via RIPv1.

Screenshots :






Cisco Packet Tracer File Edit Options View Tools Extensions Window Help
Mon 30 Sep 8:47 PM
Cisco Packet Tracer
Logical
Physical
Root
1941 Router0
1941 Router1
2960-24TT Switch0
2960-24TT Switch1
PC-PT PC1
PC-PT PC2
PC-PT PC3
PC-PT PC4
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Serial DCE
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
Successful PC1 Router0 IC... 0.000 N 0 (...) (delete)
Successful PC3 Router1 IC... 0.000 N 1 (...) (delete)
Failed PC1 Router1 IC... 0.000 N 2 (...) (delete)