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

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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 :

Command Prompt

```
Pinging 192.168.10.5 with 32 bytes of data:

Reply from 192.168.10.5: bytes=32 time=21ms TTL=128
Reply from 192.168.10.5: bytes=32 time<1ms TTL=128
Reply from 192.168.10.5: bytes=32 time=7ms TTL=128
Reply from 192.168.10.5: bytes=32 time=15ms TTL=128

Ping statistics for 192.168.10.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 21ms, Average = 10ms

C:\>ping 192.168.5.1

Pinging 192.168.5.1 with 32 bytes of data:

Reply from 192.168.10.1: Destination host unreachable.
Request timed out.
Reply from 192.168.10.1: Destination host unreachable.
Reply from 192.168.10.1: Destination host unreachable.

Ping statistics for 192.168.5.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 192.168.5.5

Pinging 192.168.5.5 with 32 bytes of data:

Reply from 192.168.10.1: Destination host unreachable.
Reply from 192.168.10.1: Destination host unreachable.
Request timed out.
Reply from 192.168.10.1: Destination host unreachable.

Ping statistics for 192.168.5.5:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
C:\>
C:\>
C:\>ping 192.168.5.10

Pinging 192.168.5.10 with 32 bytes of data:

Reply from 192.168.10.1: Destination host unreachable.
Request timed out.
Reply from 192.168.10.1: Destination host unreachable.
Reply from 192.168.10.1: Destination host unreachable.

Ping statistics for 192.168.5.10:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```