Practical: Configuring RIP Version 2

Objective

To configure and verify the functionality of RIP Version 2 (RIPv2) in a network environment using a simulator such as Cisco Packet Tracer.

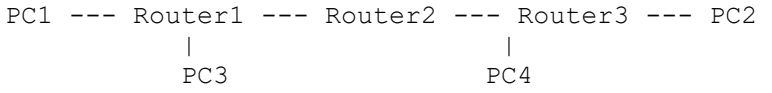
Theory

- **Routing Information Protocol (RIP)** is a distance-vector routing protocol.
- **RIPv2** is an enhancement of RIP Version 1:
  - Supports **classless routing** (subnet masks and VLSM).
  - Sends routing updates via **multicast** (224.0.0.9).
  - Maximum hop count: 15 (infinite = 16).
- Broadcasts routing updates every 30 seconds.

Network Topology

Devices:

- 3 Routers (Router1, Router2, Router3)
- 3 PCs (PC1, PC2, PC3)
- Connections: Routers interconnected; PCs connected to routers.



IP Addressing

Device	Interface	IP Address	Subnet Mask
PC1	FastEthernet0	192.168.1.2	255.255.255.0
Router1	FastEthernet0/0	192.168.1.1	255.255.255.0
Router1	Serial0/0/0	10.0.0.1	255.255.255.252
Router2	Serial0/0/0	10.0.0.2	255.255.255.252
Router2	Serial0/0/1	10.0.0.5	255.255.255.252
Router3	Serial0/0/1	10.0.0.6	255.255.255.252
PC2	FastEthernet0	192.168.2.2	255.255.255.0
Router3	FastEthernet0/0	192.168.2.1	255.255.255.0

Steps to Configure RIPv2

Step 1: Configure IP Addresses

1. Assign IP addresses to PCs and routers according to the table.
2. Test basic connectivity using the `ping` command between directly connected devices.

Step 2: Enable RIP Version 2 on Routers

1. Access each router in CLI mode and enter global configuration:

```
Router> enable
Router# configure terminal
```

2. Enable RIP routing:

```
Router(config)# router rip
```

3. Set RIP to Version 2:

```
Router(config-router)# version 2
```

4. Advertise connected networks:
   - On **Router1**:

```
Router(config-router)# network 192.168.1.0
Router(config-router)# network 10.0.0.0
```

   - On **Router2**:

```
Router(config-router)# network 10.0.0.0
```

   - On **Router3**:

```
Router(config-router)# network 10.0.0.0
Router(config-router)# network 192.168.2.0
```

5. Disable auto-summarization (optional for discontiguous networks):

```
Router(config-router)# no auto-summary
```

6. Exit configuration:

```
Router(config-router)# exit
Router(config)# exit
```

Step 3: Verify Configuration

1. View the routing table on each router:

```
Router# show ip route
```

   Ensure that routes learned via RIP are marked with an "R".

2. Monitor RIP updates:

```
Router# debug ip rip
```

3. Test connectivity between end devices (e.g., PC1 to PC2).

Result

- Routers dynamically exchange routing information using RIP Version 2.
- PCs successfully communicate across the network.

Conclusion

RIP Version 2 enhances RIPv1 by supporting classless routing, making it suitable for modern networks. It remains simple but is limited by a hop count of 15, which restricts scalability.