Aim: To configure Routing Information Protocol (RIP) Version 1 and Version 2 for interconnecting multiple routers in a network using Cisco Packet Tracer.

- **Routing Information Protocol (RIP):**
  - A distance-vector routing protocol that uses hop count as the metric.
  - RIP periodically broadcasts its routing table to neighboring routers.
- **RIPv1:**
  - Classful protocol (does not support subnetting or CIDR).
  - Broadcasts updates to 255.255.255.255.
- **RIPv2:**
  - Classless protocol (supports subnetting and CIDR).
  - Multicasts updates to 224.0.0.9.
  - Provides additional features like authentication and disabling auto-summarization.

Required Components

1. Cisco Packet Tracer software.
2. Devices:
   - 2 or more Cisco Routers.
   - End devices (PCs) for testing connectivity.
   - Switches (if required).
3. Serial or Ethernet cables.

Steps for RIPv1 Configuration

1. **Network Topology**
   - Create a network with at least two routers.
   - Connect routers using a serial or Ethernet link.
   - Assign IP addresses to all interfaces in a classful manner.

   Example:

   - Router1: `192.168.1.0/24`
   - Router2: `192.168.2.0/24`
2. **Router Configuration**
   - Select the first router and open the CLI.
   - Configure the router as follows:

```
bash
Copy code
Router> enable
Router# configure terminal
Router(config)# interface <interface-id>
Router(config-if)# ip address <IP-address> <subnet-mask>
```

```
Router(config-if)# no shutdown
Router(config-if)# exit
```

- Repeat for all connected interfaces.

3. **Activate RIPv1**
   - Enable RIP and add networks:

```
bash
Copy code
Router(config)# router rip
Router(config-router)# network <network-address>
Router(config-router)# exit
```

4. **Verify Connectivity**
   - Check the routing table:

```
bash
Copy code
Router# show ip route
```

Steps for RIPv2 Configuration

1. **Network Topology**
   - Create a network with at least two routers.
   - Assign IP addresses to all interfaces (supports classless addressing).

   Example:

   - Router1: `192.168.1.0/24`
   - Router2: `172.16.1.0/24`
2. **Router Configuration**
   - Follow the same steps as RIPv1 for assigning IP addresses.
3. **Activate RIPv2**
   - Enable RIP and set the version:

```
bash
Copy code
Router(config)# router rip
Router(config-router)# version 2
Router(config-router)# network <network-address>
Router(config-router)# no auto-summary  # Disable auto-
summarization
Router(config-router)# exit
```

4. **Verify Configuration**
   - Check the routing table:

```
bash
Copy code
Router# show ip route
```

   - Enable debugging to check RIP updates:

```
bash
Copy code
Router# debug ip rip
```

Verification

1. **Ping Test**
   - Test connectivity between end devices using the `ping` command.
2. **Routing Table**
   - Check whether RIP routes are present in the routing table:

     ```
     bash
     Copy code
     Router# show ip route
     ```

3. **RIP Configuration**
   - Verify the running configuration:

     ```
     bash
     Copy code
     Router# show running-config
     ```