CN LAB Experiment 7

Objective

This lab experiment focuses on configuring RIPv1 on two routers using Cisco Packet Tracer, allowing them to communicate across different local area networks (LANs). The setup will involve configuring IP addresses on router interfaces, testing connectivity before and after enabling RIPv1, and ultimately establishing routing between the routers.

Requirements

- Cisco Packet Tracer software
- Basic knowledge of Cisco CLI commands

Procedure

Network Design

- **Router1 (R1)** and **Router2 (R2)** are connected to their respective networks (LAN1 and LAN2).
- **PC1** is connected to R1, and **PC2** is connected to R2.
- **Router R1** and **Router R2** will communicate through a serial link.

Step 1: Configure IP Addresses on Router R1

1. **Access the CLI of Router R1**:
    - Click on **Router R1** in the setup and navigate to the **CLI** tab.
2. **Assign IP Address to Serial0/1/0**:

R1# conf t

R1(config)# interface serial 0/1/0

R1(config-if)# ip address 10.1.1.1 255.255.255.0

R1(config-if)# no shutdown

3. **Assign IP Address to GigabitEthernet0/1**:

R1# conf t

R1(config)# interface gigabitethernet 0/1

R1(config-if)# ip address 192.168.5.1 255.255.255.0

R1(config-if)# no shutdown

Step 2: Configure IP Addresses on Router R2

1. **Access the CLI of Router R2**:

- Click on **Router R2** in the setup and navigate to the **CLI** tab.

2. **Assign IP Address to Serial0/1/1**:

R2# conf t

R2(config)# interface serial 0/1/1

R2(config-if)# ip address 10.1.1.2 255.255.255.0

R2(config-if)# no shutdown

3. **Assign IP Address to GigabitEthernet0/1**:

R2# conf t

R2(config)# interface gigabitethernet 0/1

R2(config-if)# ip address 192.168.10.1 255.255.255.0

R2(config-if)# no shutdown

Step 3: Test Connectivity from PC1 to Router R1

1. **Ping R1's GigabitEthernet and Serial IPs from PC1**:

- Open **PC1's Command Prompt** and enter the following commands:

ping 192.168.5.1

ping 10.1.1.1

- You should receive successful replies, confirming that PC1 can communicate with R1.

Step 4: Test Connectivity from PC1 to Router R2

1. **Ping Router R2's IPs from PC1**:

- While still in **PC1's Command Prompt**, try to ping R2's IP addresses:

ping 10.1.1.2

ping 192.168.10.1

- At this stage, you will likely receive an error message indicating that the destination is unreachable. This is expected, as R1 and R2 have not yet been configured to route traffic between them.

Step 5: Configure RIPv1

1. **Enable RIPv1 on Router R1**:

- Access the CLI for Router R1 and enter the following commands:

R1# conf t

```
R1(config)# router rip
R1(config-router)# version 1
R1(config-router)# network 10.1.1.0
R1(config-router)# network 192.168.5.0
R1(config-router)# exit
```

2. **Enable RIPv1 on Router R2**:
    - Access the CLI for Router R2 and enter the following commands:

```
R2# conf t
R2(config)# router rip
R2(config-router)# version 1
R2(config-router)# network 10.1.1.0
R2(config-router)# network 192.168.10.0
R2(config-router)# exit
```

Step 6: Verify and Check RIP Settings in Packet Tracer

1. **Check RIP Configuration on Router R1**:
    - After setting up RIPv1, confirm that R1 and R2 can communicate and share routing information about the networks. Use the command:

```
show ip route
```

2. **Check Routing Routes on Router R2**:
    - Likewise, check the routing routes on R2 using:

```
R2# show ip route
```

Step 7: Test Connectivity After RIPv1 Configuration

1. **Ping the Target Network from PC1**:
    - Now that RIPv1 is set up, test the connection by pinging R2's serial port from PC1:

```
ping 10.1.1.2
```

    - Then, ping PC3 and PC4 (assuming they are in the 192.168.10.0/24 subnet):

```
ping 192.168.10.2  # Assuming PC3 has this IP
ping 192.168.10.3  # Assuming PC4 has this IP
```

    - Users on LAN1 should now have access to LAN2.

2. **Check Connectivity from LAN2 to LAN1**:
    - Similarly, PCs on the 192.168.10.0/24 network should be able to access 192.168.5.0/24 (LAN1) without any issues.

Step 8: Further Verification of RIPv1 Configuration

1. **Check the Routing Protocol in Use**:
    - Use the command show ip protocols on R1 to determine which routing protocol is active:

R1# show ip protocols

    - The output will indicate that the routing protocol in use is "RIP."

2. **Check Routing Protocol on Router R2**:
    - Similarly, run the same command on R2:

R2# show ip protocols

3. **View Detailed Routes**:
    - To see detailed RIP entries, run the following command on R1:

R1# show ip rip database

4. **Check RIP Entries on Router R2**:
    - Use the same command on R2 to check its RIP entries:

R2# show ip rip database

5. **View Current Router Configurations**:
    - Finally, examine the current configuration of both routers using:

R1# show running-config

R2# show running-config

Conclusion

In this lab, we successfully configured RIPv1 on two routers and tested connectivity between devices across different networks. The process included assigning IP addresses to router interfaces, testing connectivity before and after enabling RIP, and verifying the routing configurations using commands like show ip route, show ip protocols, and show running-config. This experiment demonstrates the significance of routing protocols in facilitating communication between different networks and troubleshooting routing configurations.