

LAB EXAMINATION – 2 (COMPUTER NETWORKS)

(RA2211003050177)

Objective:

Set up and configure a network topology using RIP and OSPF routing protocols in Cisco Packet Tracer. Customize the network by assigning each computer a name and an IP address using the last three digits of the roll number.

Procedure:

1. Network Topology Design:

- o **Create a topology that includes:**
 - 10-12 computers distributed across two LANs.
 - Use two switches, each connecting a group of computers in a separate LAN.
 - Two routers connected via a WAN link.
- o **Device Distribution:**
 - LAN 1: 5-6 computers connected to Switch 1.
 - LAN 2: 5-6 computers connected to Switch 2.
- o **Device Naming Convention:**
 - Each computer was assigned a name in the format: PC_RollNumber (e.g., PC_123).

2. IP Address Configuration:

- o **Assign IP addresses to the computers in each LAN.**
 - LAN 1: IP addresses configured with the subnet 192.168.1.0/24, where each PC's IP address ends with the last three digits of the roll number (e.g., 192.168.1.123 for PC_123).
 - LAN 2: IP addresses configured with the subnet 192.168.2.0/24, similarly using the roll number for the last octet (e.g., 192.168.2.123 for PC_123).
- o **Router Interface Configuration:**
 - Router 1 interfaces were set up with the IP address 192.168.1.1/24 for LAN 1.
 - Router 2 interfaces were configured with 192.168.2.1/24 for LAN 2.
 - The WAN link between routers used a point-to-point subnet (e.g., 10.0.0.1/30 for Router 1 and 10.0.0.2/30 for Router 2).

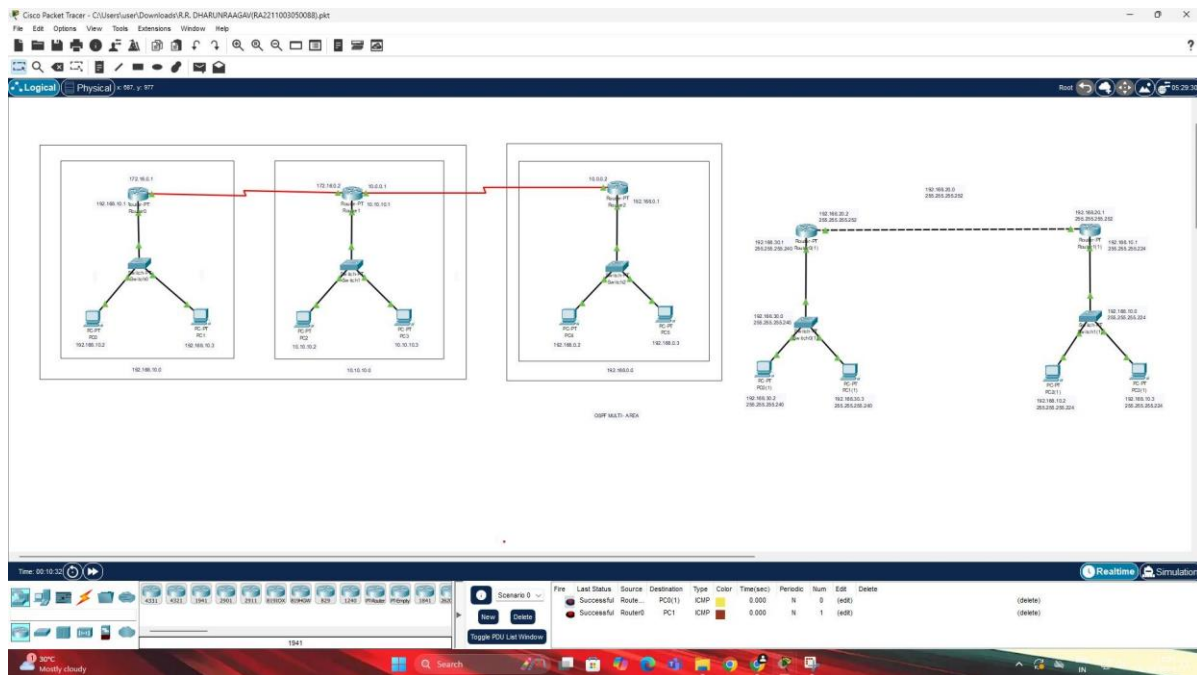
3. Routing Protocols Configuration:

- o **Configure RIP v1 on Router 1:**
 - Added the network commands for 192.168.1.0 and 10.0.0.0 to enable RIP routing.
- o **Configure OSPF on Router 2:**
 - OSPF was set up using the area 0 configuration.
 - Added network commands for 192.168.2.0 and 10.0.0.0.
- o **Ensuring Communication:**
 - Verified that the routes were properly advertised and shared between the two routing protocols using route redistribution.

4. Packet Tracer Configuration Steps:

- o **Add Devices and Create Connections:**
 - Placed all computers, switches, and routers in the workspace.
 - Connected devices with appropriate cabling (copper straight-through for computers to switches and serial connections for routers).
 - o **Configure IP Addresses:**
 - Manually set IP addresses for all computers and configured default gateways.
 - o **Set Up Routing:**
 - Enabled RIP on Router 1 and OSPF on Router 2.
 - Configured route redistribution on both routers for seamless communication.
 - o **Verification:**
 - Used the `ping` command to test connectivity between LAN 1 and LAN 2.
 - Verified route tables on both routers to ensure correct route advertisement.
5. **Simulation:**
- o **Cisco Packet Tracer Simulation Mode:**
 - Switched to simulation mode to observe packet transmission.
 - Initiated message sending from a computer in LAN 1 to a computer in LAN 2.
 - Verified the successful transmission of the message and inspected routing paths.
6. **Documentation and Submission:**
- o **Procedure Documentation:** Step-by-step process of network configuration was documented as described above.
 - o **Screenshots:** Added all relevant screenshots, covering network design, IP configurations, and successful message transmission.
 - o **Packet Tracer File:** Saved the .pkt file with the completed configuration.
 - o **GitHub Submission:** Uploaded all documents, screenshots, and the .pkt file to a GitHub repository named "Lab 2 Exam".
 - o **Repository Submission:** Submitted the GitHub repository link to the instructor.

Output Screenshots:



Results:

- Successfully configured a network topology with two LANs using RIP and OSPF routing protocols.
- All devices were assigned IP addresses based on the last three digits of the roll number, maintaining the required subnet structure.
- Routing protocols were configured on the routers, allowing seamless communication between LAN 1 and LAN 2.
- The simulation mode in Cisco Packet Tracer demonstrated successful packet transmission across the network.
- Documentation and files were submitted as per the requirements.

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Github Link: <https://github.com/Anirudh9566/RA2211003050177.git>