

LAB EXAMINATION – 2 (COMPUTER NETWORKS)

(RA2211003050078)

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 RIPv1 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.

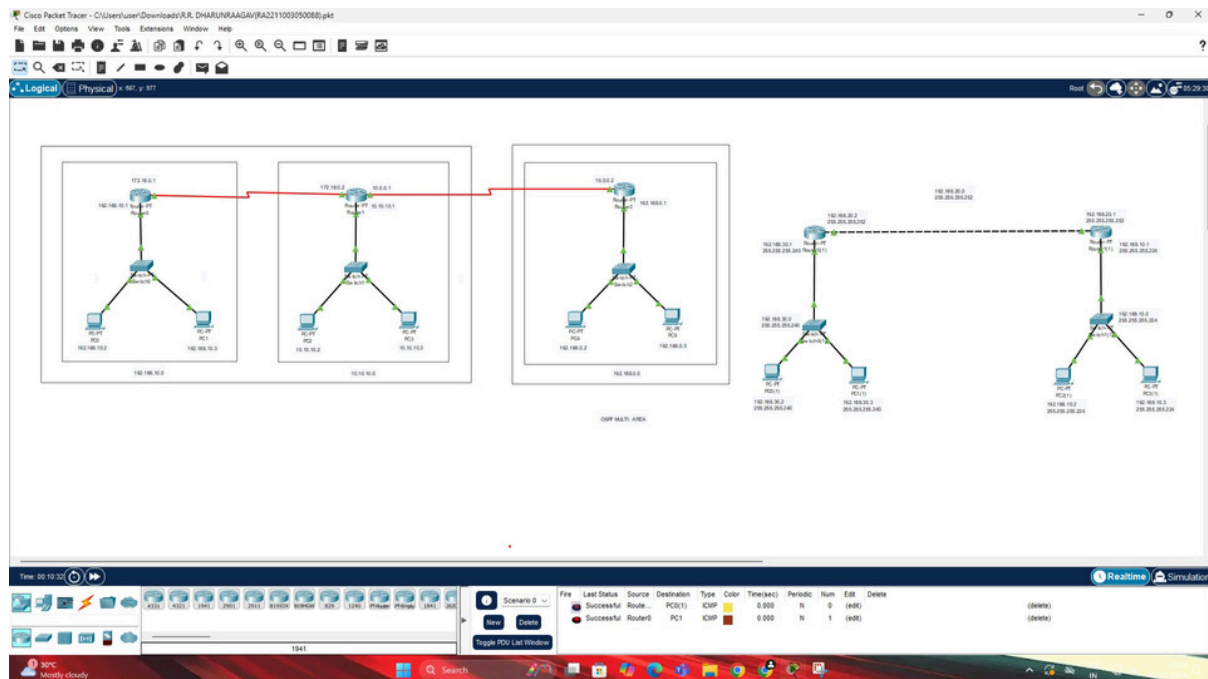
o Ensuring Communication:

- 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 CiscoPacketTracerSimulationMode:
 - Switched to simulation mode to observe packet transmission.
 - Initiated messages 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 ProcedureDocumentation: 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 PacketTracerFile: Saved the .pkt file with the completed configuration.
 - o GitHubSubmission: Uploaded all documents, screenshots, and the .pkt file to a GitHub repository named "Lab 2 Exam".
 - o RepositorySubmission: 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/Sudhik07/RA2211003050078-git>