LAB EXAMINATION – 2 (COMPUTER NETWORKS)

(RA2211003050141)

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.

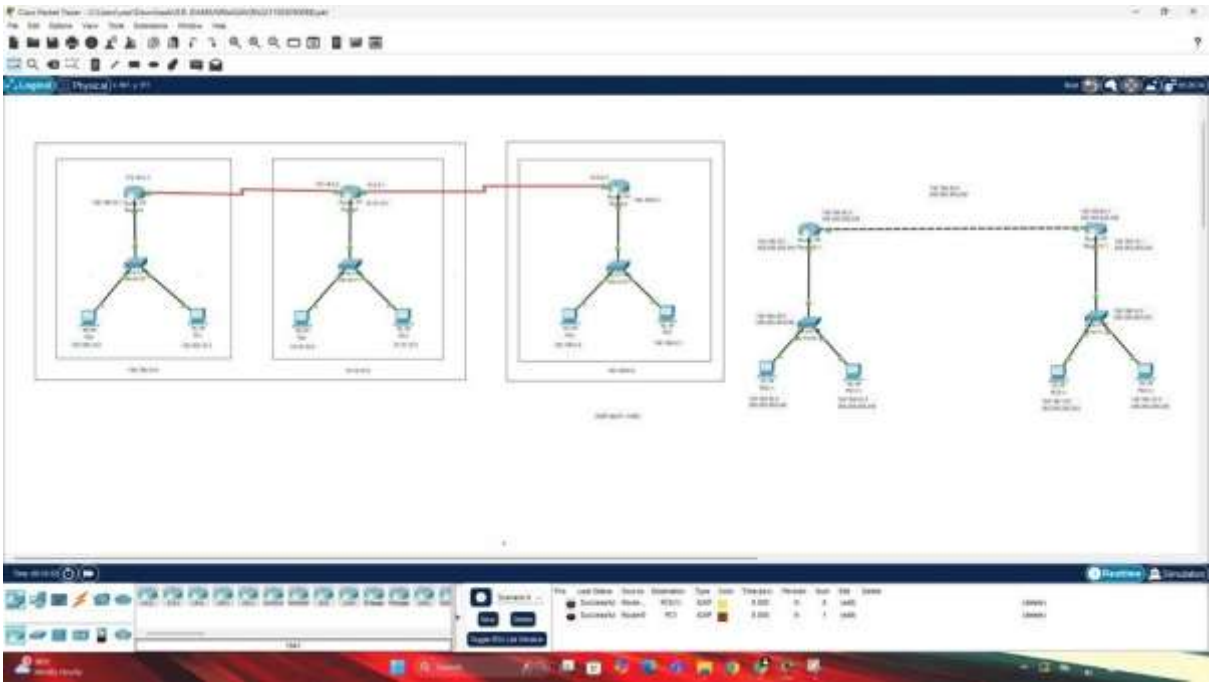
Procedure:

1. Network Topology Design:
   - 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.
   - Device Distribution:
     - LAN 1: 5-6 computers connected to Switch 1.
     - LAN 2: 5-6 computers connected to Switch 2.
   - Device Naming Convention:
     - Each computer was assigned a name in the format: PC_RollNumber (e.g., PC_123).
1. IP Address Configuration:
   - 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).
   - 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).
1. Routing Protocols Configuration:
   - Configure RIPv1 on Router 1:
     - Added the network commands for 192.168.1.0 and 10.0.0.0 to enable RIP routing.
   - 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.
   - Ensuring Communication:
     - Verified that the routes were properly advertised and shared between the two routing protocols using route redistribution.
2. Packet Tracer Configuration Steps:

- 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).
- Configure IP Addresses:
  - Manually set IP addresses for all computers and configured default gateways.
- Set Up Routing:
  - Enabled RIP on Router 1 and OSPF on Router 2.
  - Configured route redistribution on both routers for seamless communication.
- Verification:
  - Used the ping command to test connectivity between LAN 1 and LAN 2.
  - Verified routing tables on both routers to ensure correct route advertisement.

5. Simulation:
   - 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:
   - Procedure Documentation: Step-by-step process of network configuration was documented as described above.
   - Screenshots: Added all relevant screenshots, covering network design, IP configurations, and successful message transmission.
   - Packet Tracer File: Saved the .pkt file with the completed configuration.
   - GitHub Submission: Uploaded all documents, screenshots, and the .pkt file to a GitHub repository named "Lab 2 Exam".
   - 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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