**LAB EXAMINATION – 2 (COMPUTER NETWORKS)**

**(RA2211026050053)**

**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:**

* **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\_Roll Number (e.g., PC\_123).
* **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).
* **Routing Protocols Configuration:**
* **Configure RIP v1 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.
* **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 route tables on both routers to ensure correct route advertisement.
* **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.
* **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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