

Lab 9: Hardware Router Configurations

Objectives

- To be familiar with Hardware Router Connections and Configurations.

Requirements

- Hardware routers and PCs.
- Connecting cables: straight-through cable, crossover cable, and console cable.

Procedure

A: The different interfaces of all routers were configured with the given IP addresses and subnet masks. Static routes in each router were configured to route data packets from one network to each of the destination networks. Connectivity from one PC to other PCs and IP addresses of routers was tested using ping and traceroute commands. One more router (Router3) was added to Router2 using a serial interface. A suitable /30 network for interconnection between routers and a /24 network in its Ethernet interface was chosen. Additional static routing was added to ensure connectivity between each network.

B: All the static routes were removed, and RIP routing (RIP version II for VLSM) was configured. The routing table was observed, and connectivity was tested using ping and traceroute, successfully connecting each PC and router.

C: The RIP configuration was removed, and OSPF routing considering only area 0 was configured. The routing table was observed, and successful connectivity between routers and PCs was confirmed using ping and traceroute.

Activities

Activity A

- **1.** The different interfaces of all routers with given IP addresses and subnet masks were configured.
- **2.** The static routes in each router to route the data packet from one network to each of the destination networks were also configured.
- **3-4.** Connection from PC to other PCs and IP addresses of routers were done using ping and traceroute commands.
- **6.** One more router (Router3) with Router2 was added using a serial interface. A suitable /30 network was chosen for interconnection between routers and a /24 network in its Ethernet interface.
- **7.** Additional static routing was added to make connectivity between each network.

Activity B

All the static routes were removed, and RIP routing was configured (RIP version II for VLSM). The routing table was observed, and connectivity was tested using ping and traceroute, which was successful between each PC and router.

Activity C

The RIP configuration was removed, and OSPF routing considering only area 0 was configured. The routing table was observed, and successful connectivity between routers and PCs was confirmed using ping and traceroute.

Conclusion

The lab familiarized the students with hardware router connections and configurations. Various routing protocols such as static routing, RIP, and OSPF were configured and tested for connectivity between networked devices.

Exercises

What kind of differences have you experienced during this hardware based lab as compared with simulation based lab? Discuss briefly.

In a hardware-based lab, the physical interaction with actual devices provides a more hands-on experience, which can be crucial for understanding the practical aspects of networking. One can experience real-world issues such as hardware malfunctions, cable problems, and the need for proper physical layout and organization. Conversely, simulation-based labs offer a more controlled environment where one can quickly set up and modify network configurations without the constraints of physical hardware. Simulations can simplify the learning process by providing instant feedback and the ability to easily reset and repeat experiments. However, they may not fully replicate the complexity and unpredictability of real-world scenarios, making hardware-based labs essential for a comprehensive understanding of network configurations and troubleshooting.