Design and Implementation of Q-Tire Network

Assume you are a network engineer in a well-known IT company. You are required to design and implement Qatar Tires (Q-Tires) network. The building has three floors; in the first floor there are three departments (Reception, Store, Logistics), on the second floor there are three departments (Finance, Human Resources, and Sales), while the third floor hosts the IT and admin departments. Therefore, the following are part of the considerations when designing and implementing the network:

- There should be three routers connecting each floor (All placed in the server room in the IT department).
- All routers should be connected to each other using a fiber optics cable.
- Each floor is expected to have one or more Layer-2 switch/s (Placed in the respective floor).
- Each floor is expected to have a WIFI network (Access Point) connected to laptops and phones.
- Connect the switch to the router using the Gig-Ethernet port.
- Each department is expected to have a printer.
- You have been given the following private IP address **10.17.128.0/18**
- Each department is expected to be in a different VLAN with the following details:

1st Floor

- Reception VLAN-10. Number of Hosts 270.
- Store VLAN-11. Number of Hosts 300.
- Logistics VLAN-12. Number of Hosts 50.

2nd Floor

- Finance VLAN-20. Number of Hosts 60.
- HR VLAN-21. Number of Hosts 20.
- Sales VLAN-22. Number of Hosts 30.

3rd Floor

- Admin VLAN-30. Number of Hosts 15.
- IT VLAN-31. Number of Hosts 10.

- Use **RIP V2** as the routing protocol to advertise routes.
- Configure static routes on each router as a backup for the dynamic routes.
- All devices are expected to obtain their IP addresses automatically except the servers, routers.
- Configure ONLY SSH on all Switches and Routers for Remote access.
- In the IT department, add two PCs to the IT department switch for testing remote access to any location/department.
- In the IT department, add ONE Server to host the company's website (www.qtire.com), FTP service to save the company's important files, TFTP service to save the configuration files for the switches and routers, and mail server.
- Create a simple HTML page for the company and host it on their web server.
- The PCs and Server in the IT department must have both IPV4 and IPV6. Assign IPV6 manually using the following network address **2003:0D0A:ABCD::/64.**

- Use Subnetting and VLSM for IPV4.
- Configure DHCP on all routers.
- Any device on the network/VLAN must be reachable from any other network/VLAN.
- Give a hostname for all switches and routers.
- Give an interface name for all devices connected to switches and routers.

Important Notes -

1. Implement the network Using **Cisco Packet Tracer 8.2.2** and submit the packet tracer file (Project.pkt).
2. Discuss the network design solution. No discussions, NO grades. Appointments will be announced later. (40%)
3. The submission and demonstration date is in the lab week starting on Saturday **30/11/2024** before **mid-night 11:59 PM**.
4. The project carries 10 marks.
5. Maximum four students per group can work on the project.
6. No late submission is accepted.
7. Plagiarism cases will not be tolerated; a misconduct form will be submitted immediately to the HOD.
8. Students should understand all project requirements/functions.