DESIGN AND CONFIGUIRATION OF TTSET UNIVERSITY CAMPUS NETWORK

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❖ Aim

The aim of this project is to design and configure a secure and scalable network for a multi-building campus. The network connects different departments through VLANs, routers, and switches, while providing services such as DHCP, SSH, port security, and server access.
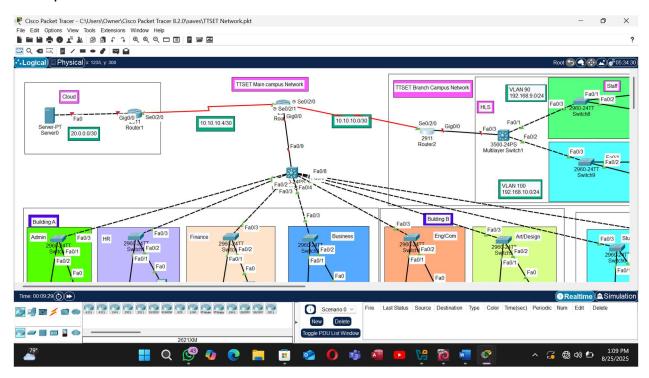
❖ Principle (Process, Software needed)

Process:

1. Create VLANs for each department.

2. Assign IP addressing schemes to each VLAN.

3. Configure routers for inter-VLAN communication using OSPF.

4. Set up DHCP for automatic IP assignment.

5. Configure SSH for secure remote access.

6. Implement port security on sensitive switches.

7. Test connectivity between different devices and services.

❖ Software Needed:

Cisco Packet Tracer (for simulation and testing).

❖ Network Diagram

The network diagram consists of three main buildings (Admin, Finance, IT, Student Labs, etc.), a main campus router, branch router, cloud server, and multiple VLANs.

❖ List of Materials

Routers (Cisco 2911) – 2 units

Layer 3 Switches – 2 units

Layer 2 Switches – 8 unit

PCs – per department

Printers – per department

Servers (Email, FTP, Web) – 3 units

Cloud (for external connectivity)

❖ Network Configuration

- VLAN Configuration
- VLAN 10: Admin (192.168.1.0/24)
- VLAN 20: HR (192.168.2.0/24)
- VLAN 30: Finance (192.168.3.0/24)
- VLAN 40: Business (192.168.4.0/24)
- VLAN 50: Eng/Com (192.168.5.0/24)
- VLAN 60: Art/Design (192.168.6.0/24)
- VLAN 70: Student Lab (192.168.7.0/24)
- VLAN 80: IT Department (192.168.8.0/24)
- VLAN 90: Staff (192.168.9.0/24)
- VLAN 100: Student Branch Lab (192.168.10.0/24)

2. Routing

OSPF is used to connect all VLAN networks.

Main campus router and branch router connected through serial link.

3. DHCP

Each router provides DHCP service for its connected VLANs.

4. SSH Configuration

Enabled on routers and switches for secure management.

5. Port Security

Implemented in the IT department to restrict access to specific devices.

❖ Conclusion

The project successfully demonstrates how a large campus network can be designed and configured using VLANs, routers, and switches. The setup ensures secure communication between different departments, automatic IP management through DHCP, secure access via SSH, and effective inter-VLAN routing with OSPF. The simulation confirms that all devices can communicate as required, making the design both reliable and scalable.