Campus Network Infrastructure

Introduction

This project presents the design and implementation of a **Campus Network Infrastructure** using **Cisco Packet Tracer**. It was undertaken as part of my **CCNA (Cisco Certified Network Associate)** learning to develop practical skills in network design, VLAN configuration, routing, and server integration in a simulated campus environment.

Objectives

- To design a **structured, scalable network** for a campus with multiple buildings.
- To implement **VLANs** for logical segmentation of the network.
- To provide **inter-VLAN communication** using routing techniques.
- To establish **WAN connectivity** between the main campus and branch campus.
- To configure essential **network services** like web, FTP, and email servers.

Network Design

The network consists of:

- **Core Router** for WAN connectivity and routing between internal VLANs.
- **Layer 2 & Layer 3 Switches** for VLAN segmentation across different campus buildings.
- **Multiple VLANs** configured for departments, users, staff, and students.
- **Branch Connectivity** to another campus using routers.
- **Servers** providing:
    - Web Services
    - FTP Services
    - Email Services
- **Printers** for departmental use connected to specific VLANs.

VLAN Configuration

VLAN ID	Department / Zone	Subnet
10	Building A - VLAN10	192.168.1.0/24
20	Building A - VLAN20	192.168.2.0/24
30	Building A - VLAN30	192.168.3.0/24
40	Building A - VLAN40	192.168.4.0/24
50	Building A - VLAN50	192.168.5.0/24
90	Branch Staff - VLAN90	192.168.0.0/24
10	Branch Student - VLAN10	192.168.10.0/24

Routing Configuration

- **Static Routing** was used to enable communication between VLANs and across the WAN to the branch campus.
- The core router managed traffic between all the VLANs and remote networks.

Network Services Configured

- **Web Server** for hosting websites.
- **FTP Server** for file sharing.
- **Email Server** for internal communication.

Simulation Testing

- **Successful ping tests** were conducted between different VLANs.
- Connectivity between **main campus** and **branch campus** verified.
- Servers (Web, FTP, Email) were reachable from client PCs in their respective VLANs.

Conclusion

This project provided **hands-on experience** in network design, VLAN implementation, static routing, and configuring essential network services. The **Cisco Packet Tracer** simulation successfully demonstrated a real-world-like **campus networking setup** suitable for academic and practical reference.