

## Assignment 10

Aim - A case study to design and configure any organisation network

To design and configure a detailed organization network spanning three floors, we need to address the protocols used across all the layers of the network architecture. The OSI and TCP/IP model helps us define the various layers and their protocols.

Design and implement of network across 3 floors (9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>)

### i 9<sup>th</sup> Floor

902 - Lab

903 - HOD room

904 - Staff room

905 - Staff room

906 - Lab and server room

### ii 10<sup>th</sup> Floor

1001 - Class room

1002 - Lab

1003 - Lab

1004 - Lab

1005 - Lab

1006 - Lab

### iii 11<sup>th</sup> Floor

1101 - Class room

1103 - Class room

1102 - Class room

1104 - Class room

Implement VLANs for network segmentation  
Ensure network security through VLANs, access control and firewall configuration  
Provide Wi-Fi connectivity for faculty and students  
Enable centralized monitoring and management of the network

## # Requirements

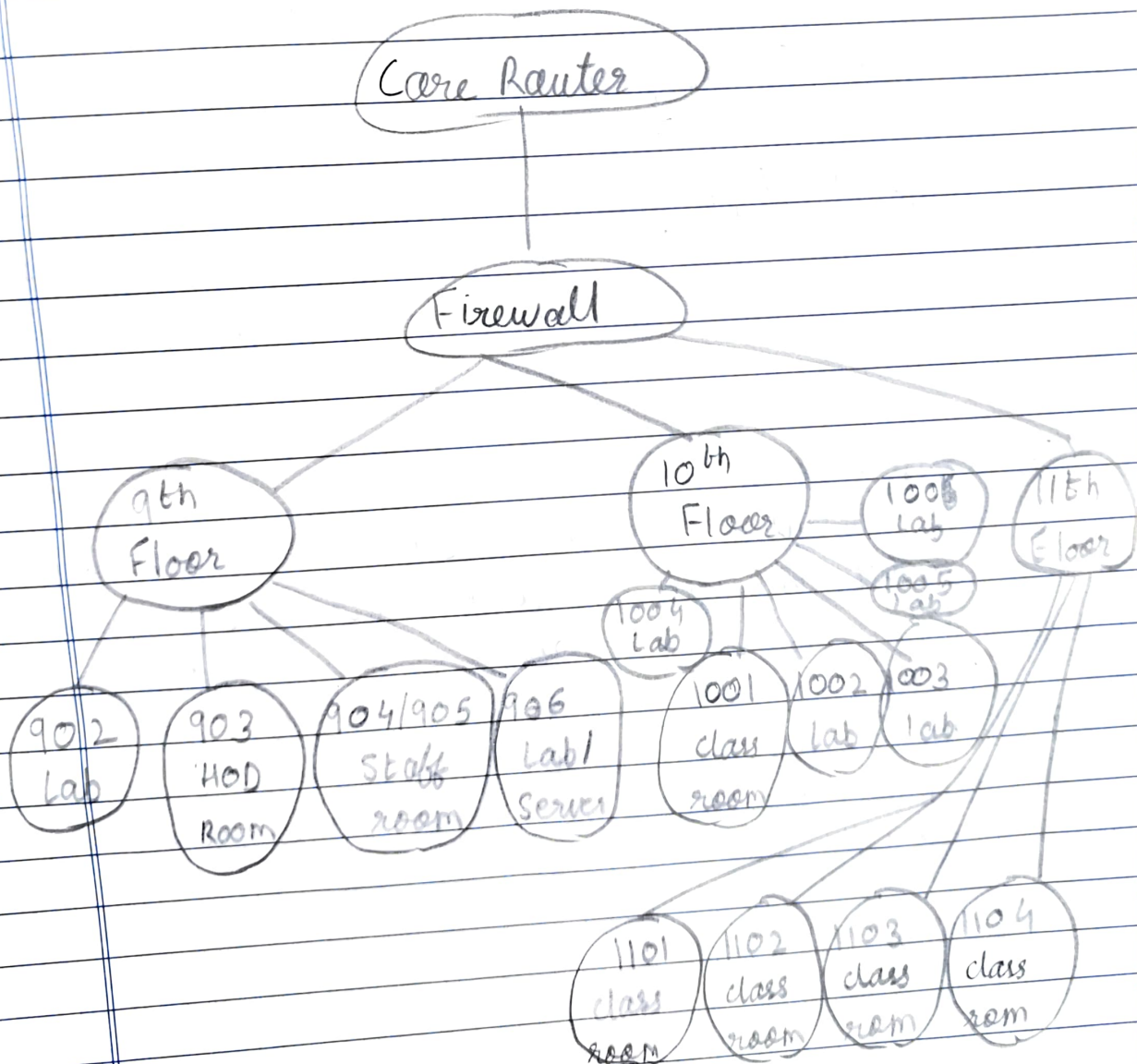
- 1 Hardware requirements
  - i Core Switches - Layer 3 switches per inter VLAN routing
  - ii Access switches - Layer 2 switches for each floor
  - iii Router / Firewall - For internet access and external connectivity
  - iv Wireless Access Points (APs) - For wireless connectivity in common areas and Labs
  - v Lab server - For managing the network lab on 3 floors
- 2 Software Requirements
  - i Network Operating System - For configuring switches and routers
  - ii Firewall Software - For securing network traffic
  - iii Network Monitoring Tools - SNMP-based tools for real time m
- 3 IP Addressing Scheme
  - i IP subnet 192.168.0.0/16 (Class B network)
  - ii Subnet Allocation - VLAN 10 - 192.168.1.0/24  
VLAN 20 - 192.168.2.0/24  
VLAN 30 - 192.168.3.0/24



VLAN 40 - 192.168.4.0/24

i Subnet Mask - 255.255.255.0 (124)

# Network Design  
9th Floor



## # Protocol Stack and Network Layer Configuration

Layer 2 (Data Link layer) - Ethernet (IEEE 802.3)  
with VLAN tagging  
(IEEE 802.1Q)

Layer 3 (Network Layer) - IP routing with OSPF  
or static routes

Layer 4 (Transport Layer) - TCP/UDP for data  
transfer

Layer 7 (Application layer) - Services such as  
HTTP, HTTPS, FTP  
and DNS

## # Conclusion

The network design ensures high availability, scalability and security. VLAN segmentation, access control and firewall policies protect critical data and system.

This case study includes all essential aspects of designing and configuring a robust and secure network.