Experiment No. 1

Aim: To study college network and understand different networking devices and communication media used in college network.

Procedure:

1. Visit Computer Centre of the institute.
2. Understand different networking devices and their use.
3. Understand different communication media used in college network and their use.
4. Sketch the graphical representation of the college network and list the details of networking devices/communication media.

Details of Networking Devices:

1. Firewall:

- A Firewall is a network security device that monitors and filters incoming and outgoing network traffic based on an organization's previously established security policies.
- At its most basic, a firewall is essentially the barrier that sits between a private internal network and the public Internet.
- A firewall's main purpose is to allow non-threatening traffic in and to keep dangerous traffic out.

2. Layer 3 Switch:

- A layer 3 switch combines the functionality of a switch and a router.
- It acts as a switch to connect devices that are on the same subnet or virtual LAN at lightning speeds and has IP routing intelligence built into it to double up as a router.
- It can support routing protocols, inspect incoming packets, and can even make routing decisions based on the source and destination addresses.

3. Layer 2 Programmable Switch:

- Apart from features of Ethernet switch, a Layer 2 Programmable switch offers integrated security, including Network Admission Control (NAC), advanced quality of service (QoS), and resiliency to deliver intelligent services for the network edge.
- They also provide Network control and bandwidth optimization using advanced QoS, granular rate limiting, ACLs, and multicast services.

4. Ethernet Switch/Layer 2 Switch:

- A layer 2 switch is a type of network switch or device that works on the data link layer (OSI Layer 2) and utilizes MAC Address to determine the path through where the frames are to be forwarded.
- It uses hardware-based switching techniques to connect and transmit data in a local area network (LAN).

Details of Communication Media:

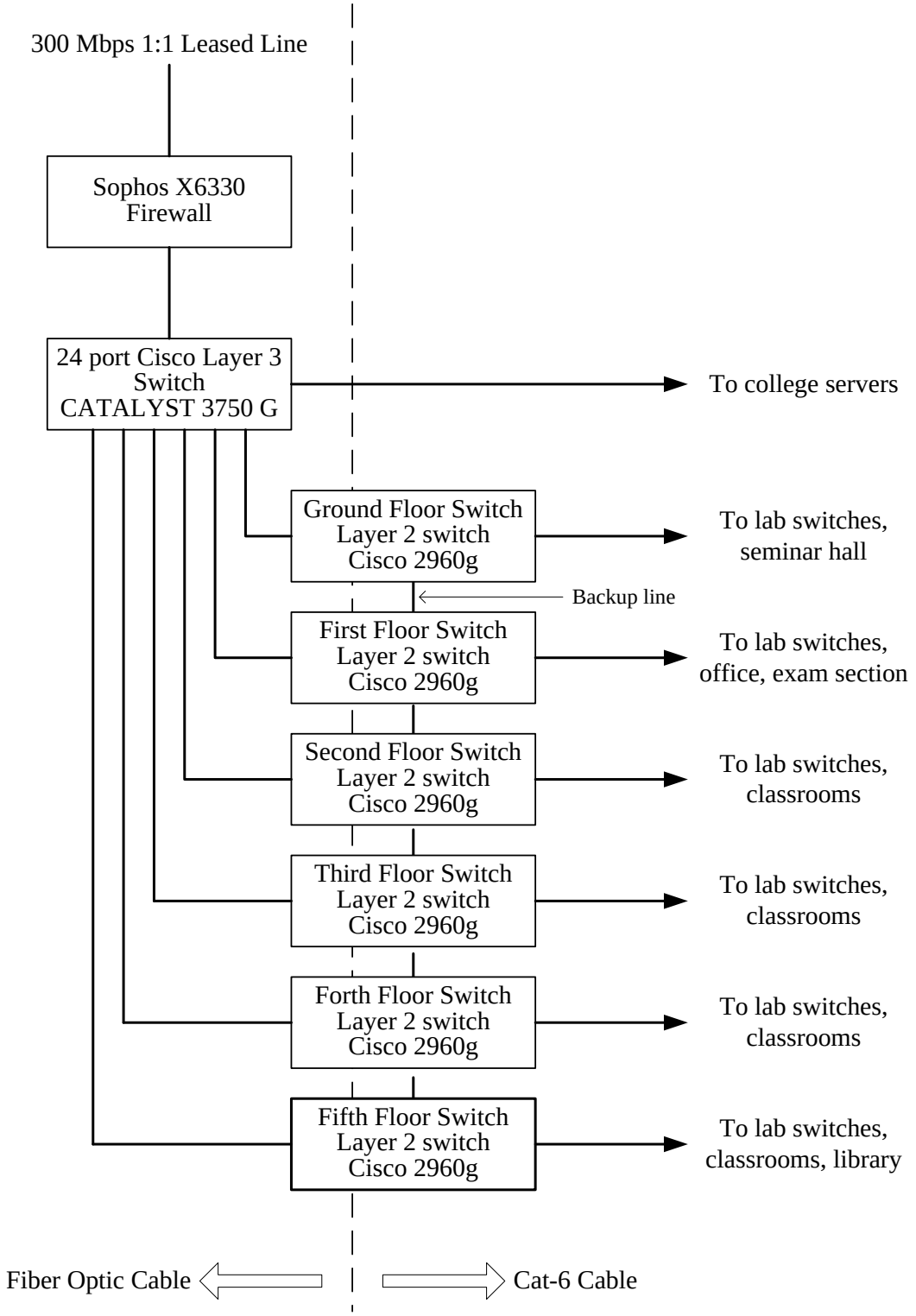
1. Fiber Optic Cable:

- Optical fiber is the most advanced guided media providing very high data rates, bandwidth, high immunity to noise and many other advantages over all sorts of guided media.
- It consists of a core that allows light wave to propagate through it. An outer layer called cladding. Fibers are protected by a plastic coating, strength member and outer jacket.
- Optical fiber works on the principle of Total Internal Reflection and can provide speeds in Gbps based on type and fabrication.

2. Cat-6 Cables:

- Category 6 cable (Cat-6) is a standardized twisted pair cable for Ethernet and other network physical layers.
- They are Unshielded Twisted Pair (UTP) cables with a data rate of 200 Mbps, used in high-speed LANs

Graphical representation of the college network:



Conclusion:

Q1. What topology is used in college network and in labs?

Ans.- College network uses tree topology whereas labs use star topology.

Q2. List different networking devices used in college backbone network.
Ans. – College backbone network comprises of SOPHOS X6330 Firewall, 24 port Cisco Layer 3 switch CATALYST 3750G and Layer 2 switches Cisco 2960g.

Q3. What communication media is used for college backbone network and in labs?
Ans.- The college backbone network is made up of fiber optic cables. The following network including labs use Cat-6 cables as a communication media.