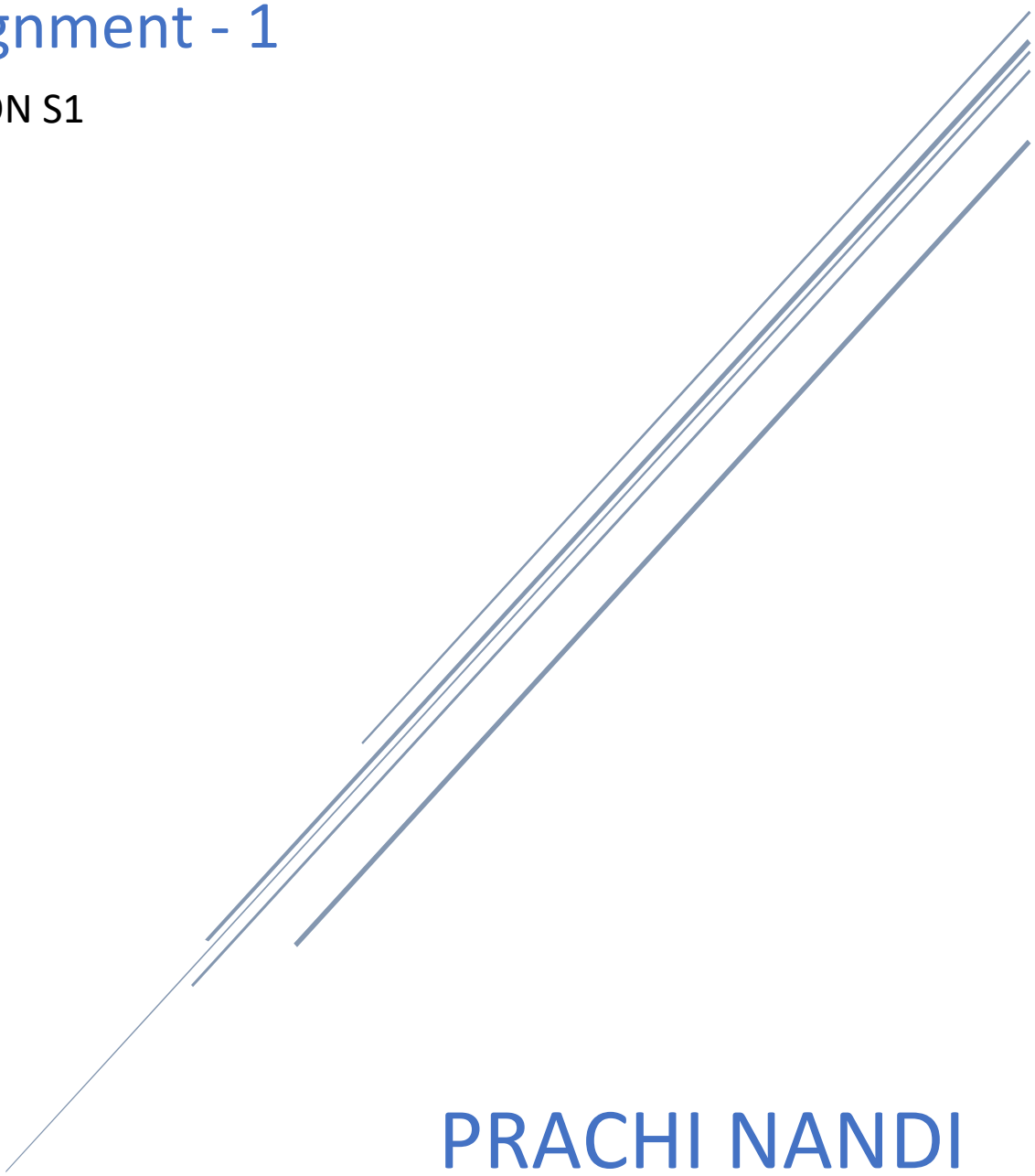
COMPUTER NETWORKS LAB

Assignment - 1

SECTION S1



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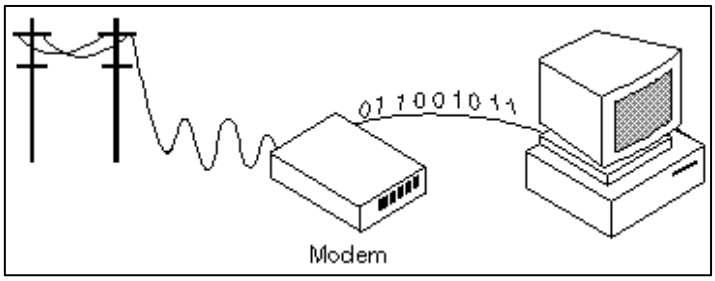
120CS0196

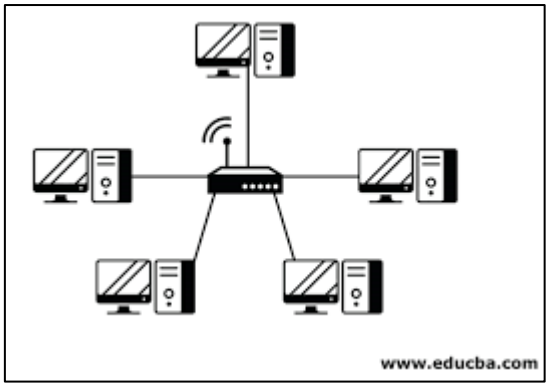
1. Study about functionality of intermediate devices used in Internet and compare it. Devices: Modem, Hub, Repeater, Switch, Bridge, Router, Firewall, Gateway.

Modem : A modem transforms digital information from computer into analog signals that can transmit over wires (and vice versa) by modulating and demodulating electrical impulses sent through phone lines, coaxal cables or other types of wiring.

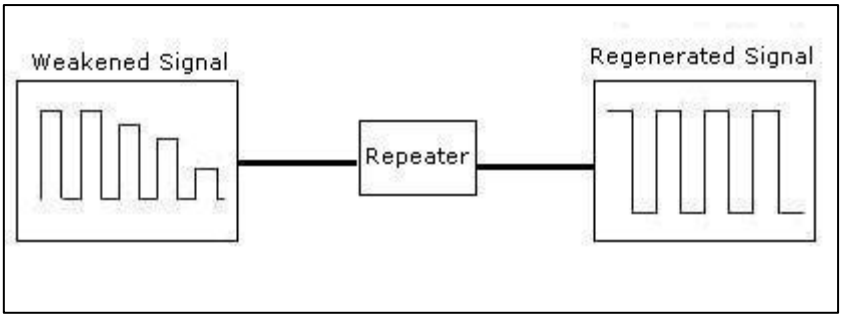


Hub : A hub is a physical layer networking device which is used to connect multiple devices in a network. They are generally used to connect computers in a LAN.

A hub has many ports in it. A computer which intends to be connected to the network is plugged in to one of these ports. When a data frame arrives at a port, it is broadcast to every other port, without considering whether it is destined for a particular destination or not.



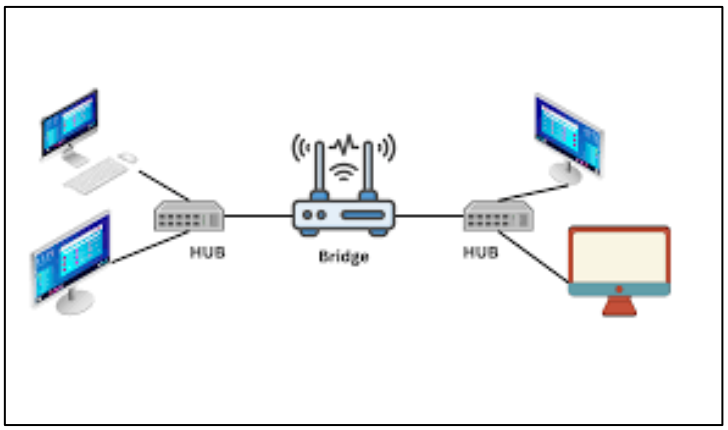
Repeater : A repeater is a dynamic network device used to reproduce the signals when they transmit over a greater distance so that the signal's strength remains equal. It can be used to create an Ethernet network. A repeater that occurs as the first layer of the OSI layer is the physical layer.



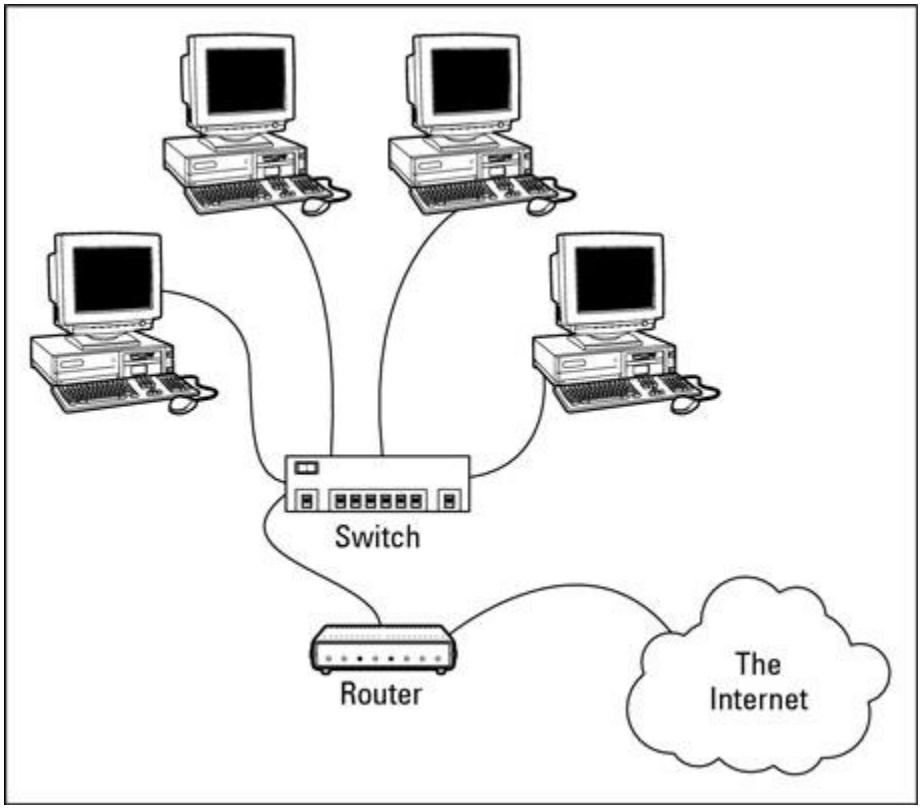
Switch : A switch is a data link layer networking device which connects devices in a network and uses packet switching to send and receive data over the network.

Like a hub, a switch also has many ports, to which computers are plugged in. However, when a data frame arrives at any port of a network switch, it examines the destination address and sends the frame to the corresponding device(s). Thus, it supports both unicast and multicast communications.

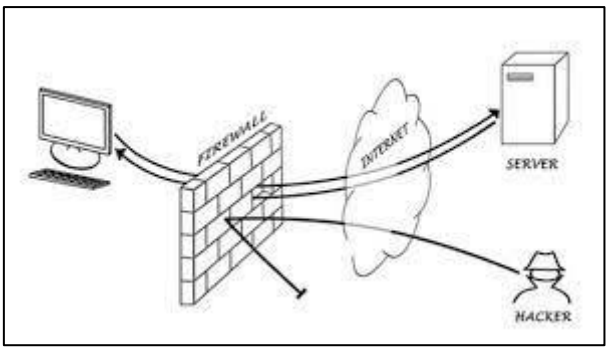
Bridge : Bridges are used to connect two subnetworks that use interchangeable protocols. It combines two LANs to form an extended LAN.



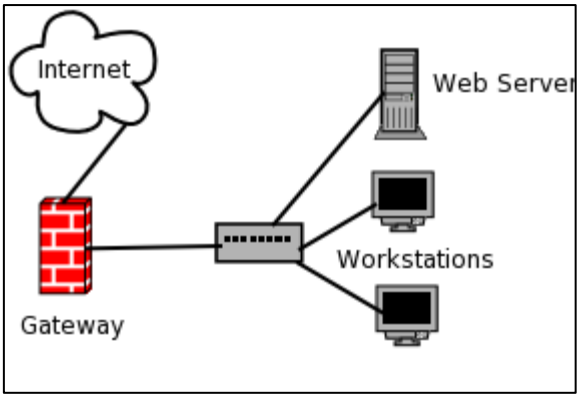
Router: Routers are networking devices operating at layer 3 or a network layer of the OSI model. They are responsible for receiving, analysing, and forwarding data packets among the connected computer networks. When a data packet arrives, the router inspects the destination address, consults its routing tables to decide the optimal route and then transfers the packet along this route.



Firewall: Network security device that monitors and filters incoming and outgoing network traffic based on a defined set of security rules. It acts as a barrier between internal private networks and external sources (such as the public Internet).



Gateway: A gateway is a network node that forms a passage between two networks operating with different transmission protocols.



2. Study about UNIX commands used in TCP/IP. Commands are: ftp, host, ifconfig,netstat, ip, ping, route, scp, sftpetc.

FTP (File Transfer Protocol) is a network protocol used for transferring files from one computer system to another

```
ftp [options] [IP]
```

Host : this command is used to find the IP address of a particular domain name or if you want to find out the domain name of a particular IP address the host command becomes handy.

```
host [-aCdlriTWV] [-c class] [-N ndots] [-t type] [-W time]
    [-R number] [-m flag] hostname [server]
```

Ping : (Packet Internet Groper) command is used to check the network connectivity between host and server/host.

```
ping [option] [hostname] or [IP address]
```

Ifconfig : (interface configuration) command is used to configure the kernel-resident network interfaces

```
ifconfig [...OPTIONS] [INTERFACE]
```

route: It is mainly used to set up static routes to specific hosts or networks via an interface. It is used for showing or update the IP/kernel routing table.

ip command: is a Linux net-tool for system and network administrators. IP stands for Internet Protocol and as the name suggests, the tool is used for configuring network interfaces.

```
ip [OPTION] OBJECT {COMMAND | help}
```

Netstat: This command displays various network related information such as network connections, routing tables, interface statistics, masquerade connections, multicast memberships etc.

SCP (Secure Copy Protocol) is a network protocol used to securely copy files/folders between Linux (Unix) systems on a network.

```
scp [option] [user_name@source_host:path/to/source/file]
[user_name@target_host:target/path]
```

SFTP(Safe File Transfer Protocol) : part of the SSH protocol designed to securely transfer files between remote systems. It allows users to view, manage, and change file and directory permissions on remote systems.

```
sftp [username]@[remote hostname or IP address]
```

THANK YOU

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Image Source- https://www.geeksforgeeks.org/basics-computer-networking/