Basics of Routers –

Router – A router is a networking hardware which is used for connection between two Local Area Networks (LAN).

- Routers are layer 3 devices. They operate in Network layer in OSI reference model.

- Routers works on the basis of IP address in the network communication.

- It is a device that forwards data packets between computer networks.

- A router needs to be connected to two LANs or two WANs, or at least one LAN and one ISP’s network (Internet Service Provider).

- Router stores memory in form of Routing Table.

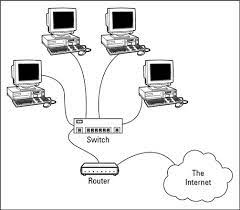
Example –

If there is a Computer with IP address 10.10.10.1, and it wants to communicate with a computer with IP address 244.244.244.1, it cannot directly happen with help of Switches/Hubs. It needs router to transfer the data packets between two nodes with different Ip addresses.

Working of Router –

When a router is placed between two LANs, MANs, WANs, its responsibility is to connect the following nodes or end devices by network communication.

1. LANs are established with specific starting IP address. Two examples of these IP addresses are 10.0.0.1 and 192.0.0.1. All Ip address starting with IP address 10 will be placed in LAN1 and all IP addresses starting with IP 192 will be placed within LAN2.
2. A default IP address will be provided to the end device in LAN1 For example 10.0.0.5 and similarly for LAN2 – 192.0.0.5.
3. As these End devices with different IP addresses cannot communicate with each other via switches, a Router will be established between these two switches.
4. The End device1 Ip address will be forwarded first to the router via a default IP. This default IP is known as the Default Gateway. Each LAN will have a default IP.
5. Data packet from end device1 is carried to end device2 with the help of router with the help of Default Gateway.
6. This is how a connection is established between two end devices with different IP addresses.



Difference between Routers and switches

Routers Switches

1. Routers are devices used to carry data packets Switches are devices used to connect two and

From one LAN to another. more end device to form a LAN.

1. They operate on Layer 3 – Network Layer. Switches operate on layer 2 – Data link layer.
2. Decisions are made on basis of IP address. Decisions are made on basis of MAC addresses.
3. It has storage allocated for Routing tables. It has storage allocated for MAC addresses.
4. Full Duplex. Half and Full Duplex.
5. Used for LAN, MAN, WAN Used for LAN