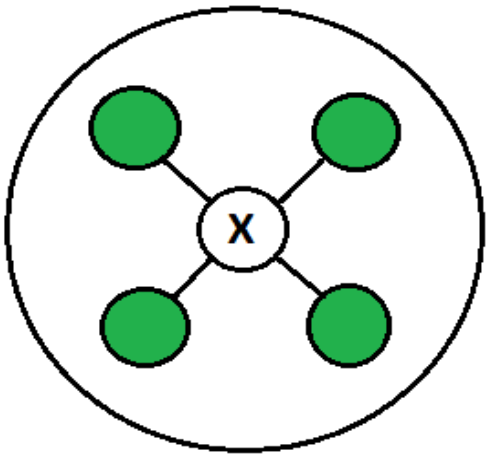
The router is a physical or virtual internetworking device that is designed to receive, analyze, and forward data packets between computer networks. A router examines a destination IP address of a given data packet, and it uses the headers and forwarding tables to decide the best way to transfer the packets. There are some popular companies that develop routers; such are Cisco, 3Com, HP, Juniper, D-Link, Nortel, etc.

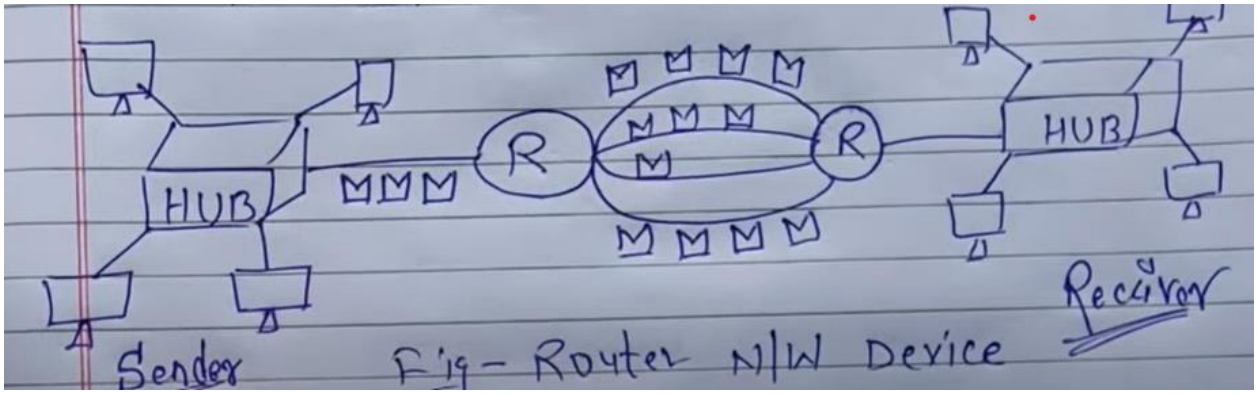
It is also known as an ***intelligent device*** as it can calculate the best route to pass the network packets from source to the destination automatically.

A router has several interfaces by which it can connect to several host systems. Routers are the devices that are operated on the Network Layer of the OSI Model, these are the most common devices used in networking.

Routers:
A Router is a networking device that forwards data packets between computer network. This device is usually connected to two or more different networks. When a data packet comes to a router port, the router reads address information in packet to determine out which port the packet will be sent. For example, a router provides you with the internet access by connecting your LAN with the Internet.



When a packet arrives at a Router, it examines destination IP address of a received packet and make routing decisions accordingly. Routers use *Routing Tables* to determine out which interface the packet will be sent. A routing table lists all networks for which routes are known. Each router's routing table is unique and stored in the RAM of the device.



Routing Table:

A routing table is a set of rules, often viewed in table format, that is used to determine where data packets traveling over an Internet Protocol (IP) network will be directed. All IP-enabled devices, including routers and switches, use routing tables.

Types of routers in networking include:

- Broadband routers: Designed for ease of installing home networks, especially for households with high-speed Internet service.

- Wireless routers: Also known as Wi-Fi routers, provide network connectivity through wireless signals.
- Wired routers: Provide network connectivity through physical wired connections.
- Core routers: High-end routers used in large-scale networks like internet service providers (ISPs) and major data centers.
- Edge routers: Placed at gateways where the networks are connected, such as subscriber edge routers and inter-provider border routers.
- Virtual routers: Software-based routers that can run on physical or virtual machines

Advantages

1.It provides connection between two dissimilar type of networks
2. Transmission rate is very high
3.It uses routing algorithm to find congestion free path
4. It provides wired or wireless facility

Disadvantages

1.More expensive compared to other network devices
2. Routers are complex to maintain
3. Security Issues
4. It will only works with routing protocol