Difference of Device

1. Hub vs Switch

Feature	Hub	Switch
Data Transmission	Broadcasts data to all connected devices, regardless of the destination.	Sends data only to the specific device it is intended for, using MAC addresses.
Speed	Slower, usually **10 Mbps or 100 Mbps**.	Faster, supports **10/100/1000 Mbps** (Gigabit Ethernet Cable).
Intelligence	Dumb device no knowledge of network structure.	Smart device learns MAC addresses and builds a table.
Cost	Cheaper.	Slightly more expensive but more cost-effective long-term.
Use Case	Legacy or small home networks	Modern LANs, offices, and data centres.

2. Switch vs Router

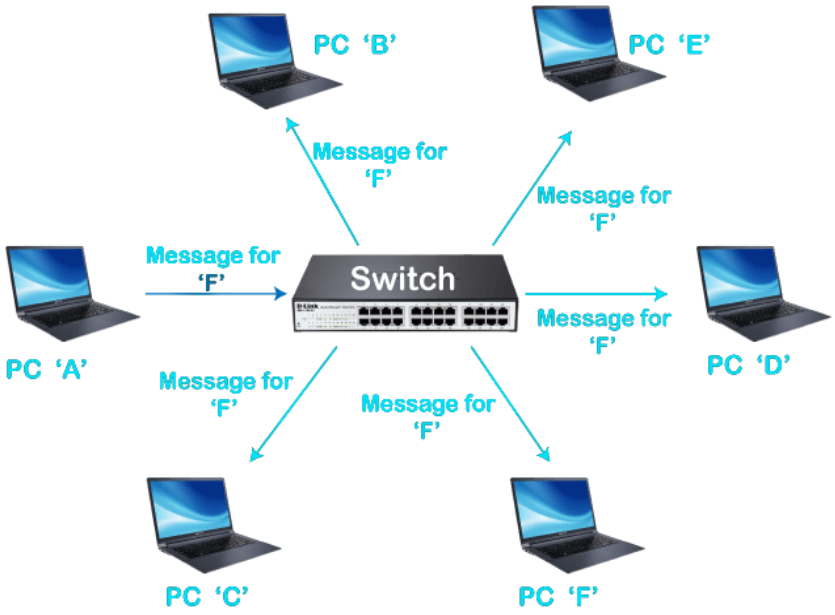
Feature	Switch	Router
Feature	Connects devices within the same network (LAN)	Connects multiple networks together (e.g., LAN to Internet)
Network Layer	Works at Data Link Layer (Layer 2)	Works at Network Layer (Layer 3)
Speed	High-speed data transfer within local network	Slightly slower due to routing tasks
Ip Assignment	Does not assign IP address	Can assign IPs via DHCP
Use Case	LANs, office networks	Internet access, connecting LANs

3. Router vs Gateway

Feature	Router	Gateway
Function	Routes data between similar networks (e.g., LAN to WAN)	Connects and translates data between different network systems
Network Layer	Operates mainly at Layer 3	Can operate at all layers
Complexity	Simpler, focused on IP routing	More complex.
Use Case	Home/office networks, internet access	Enterprise systems, different architectures (e.g., IoT to cloud)
Example	Home Wi-Fi router	VoIP gateway, email gateway, cloud API gateway

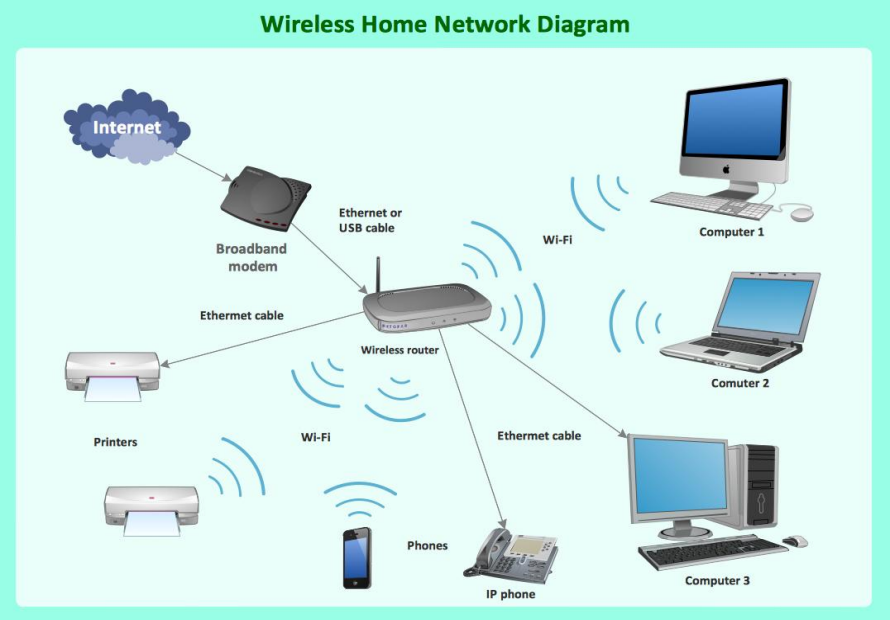
Working of Device

1. Switch



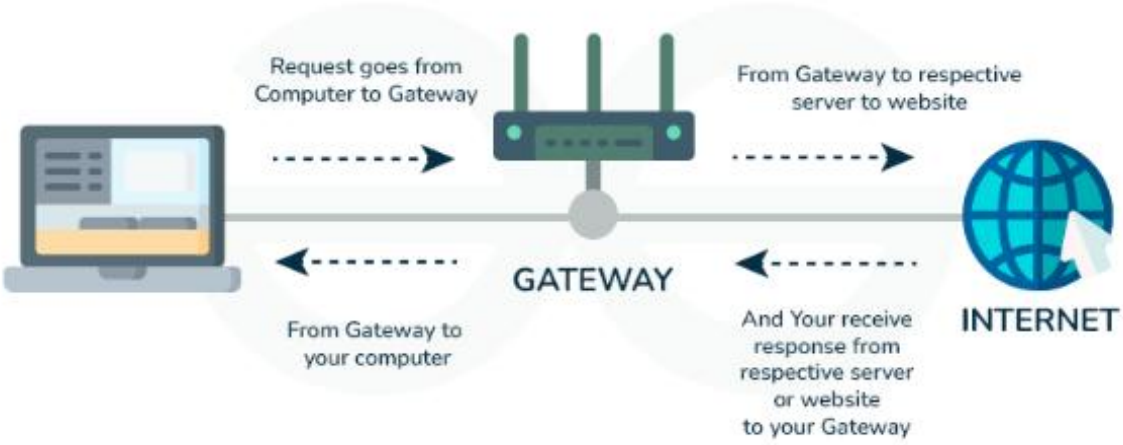
- Switches are used to connect devices within the same network or local area network (LAN). If you need to connect devices from different networks, you would typically use a router or a layer 3 switch, which can route traffic between different networks

2. Router



- Routers connect computers and other devices to the Internet. A router acts as a dispatcher, choosing the best route for your information to travel. It connects your business to the world, protects information from security threats, and can even decide which computers get priority over others.

3. Gateway



- The gateway receives data from devices within the network. After receiving data, the gateway intercept and analyse data packets, which include analysing packet header, payload etc