COMPUTER NETWORK AND GLOBAL INTERNET

Computer Network Defined

A computer network is a set of connected computers. Computers on a network are called nodes. The connection between computers can be done via cabling, most commonly the Ethernet cable, or wirelessly through radio waves. Connected computers can share resources, like access to the Internet, printers, file servers, and others. A network is a multipurpose connection, which allows a single computer to do more.

Network Topology

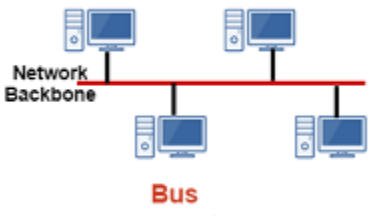
Computer networks can be broken down historically into topologies, which is a technique of connecting computers. It is the architectural structure of the computer network.

Star Topology

A star topology is a design of a network where a central node extends a cable to each computer on the network. On a star network, computers are connected independently to the center of the network. If a cable is broken, the other computers can operate without problems. A star topology requires a lot of cabling.

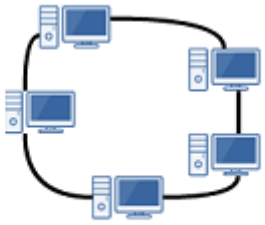
Bus Topology

A bus topology is another type of design where a single cable connects all computers and the information intended for the last node on the network must run through each connected computer. If a cable is broken, all computers connected down the line cannot reach the network. The benefit of a bus topology is a minimal use of cabling.



Ring Topology

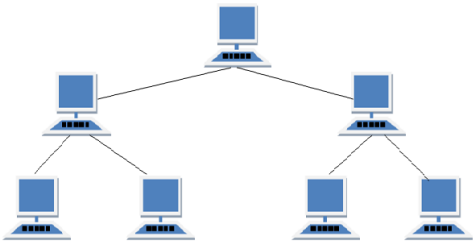
A similar topology is called a ring. In this design, computers are connected via a single cable, but the end nodes also are connected to each other. In this design, the signal circulates through the network until it finds the intended recipient. If a network node is not configured properly, or it is down temporarily for another reason, the signal will make a number of attempts to find its destination.



Ring

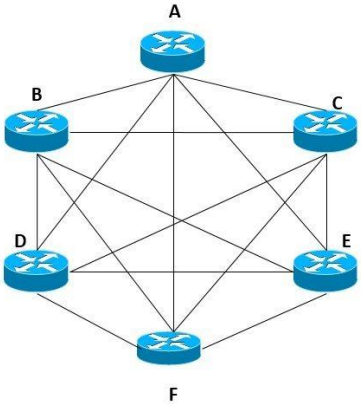
Hierarchical Topology OR Tree Topology

The hierarchical topology is also known as tree topology. In a tree topology, a central 'root' node (top level of the hierarchy) is connected to one or more other nodes that are one level lower in the hierarchy with a point-to-point physical link. The second level node may also have connected to one or more other nodes that are one level down in the hierarchy with another point-to-point link. The top level node i.e root node is the only node that has no other node above it in the hierarchy.



Mesh Topology

In a mesh network, every network device is connected to every other network device with a point-to-point connection. This topology is mostly used in WAN and wireless networks. The route concept is introduced by mesh topology and this topology is used by routers to determine the best path. Mesh network also provides physical link redundancy in the event of a link failure. As each device is connected to all other devices in a mesh network, this topology is the most expensive and difficult to maintain.



Note: A, B, C, D, E, F in the diagram is router.

Types of Network

There many types of network, working of each type is more and less same. It differs with each other based on the size, protocol(way/rules of communication)

6 types of Networks

1. Personal Area Network (PAN)
2. Local Area Network (LAN)
3. Wireless Local Area Network (WLAN)
4. Campus Area Network (CAN)
5. Metropolitan Area Network (MAN)
6. Wide Area Network (WAN)

Local Area Network (LAN)

LANs are the most common, one of the most original and one of the simplest types of networks. LANs connect groups of computers and low-voltage devices together across short distances (within a building or between a group of two or three buildings in close proximity to each other) to share information and resources. Enterprises typically manage and maintain LANs.

Using routers, LANs can connect to wide area networks (WANs, explained below) to rapidly and safely transfer data.

Wireless Local Area Network (WLAN)

Functioning like a LAN, WLANs make use of wireless network technology, such as WiFi.

Metropolitan Area Network (MAN)

These types of networks are larger than LANs but smaller than WANs – and incorporate elements from both types of networks. MANs span an entire geographic area (typically a town or city, but sometimes a campus). Ownership and maintenance is handled by either a single person or company (a local council, a large company, etc.).

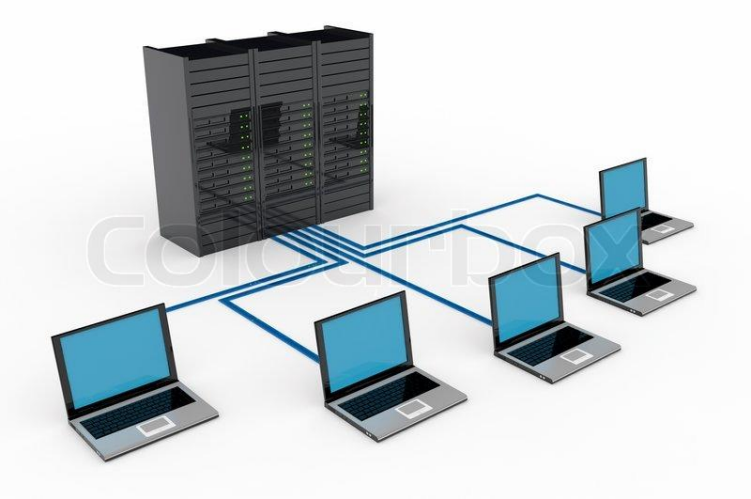
Wide Area Network (WAN)

Slightly more complex than a LAN, a WAN connects computers together across longer physical distances. This allows computers and low-voltage devices to be remotely connected to each other over one large network to communicate even when they’re miles apart.

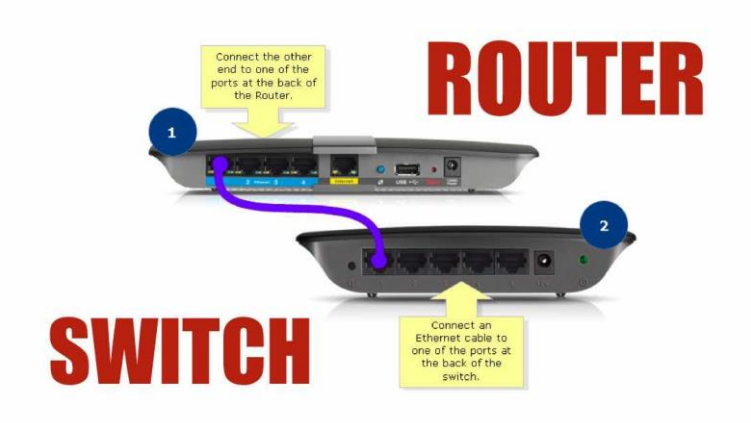
The Internet is the most basic example of a WAN, connecting all computers together around the world. Because of a WAN's vast reach, it is typically owned and maintained by multiple administrators or the public.

Some other terminology

Server: A server is a computer that provides data to other computers. It may serve data to systems on a local area network (LAN) or a wide area network (WAN) over the Internet.

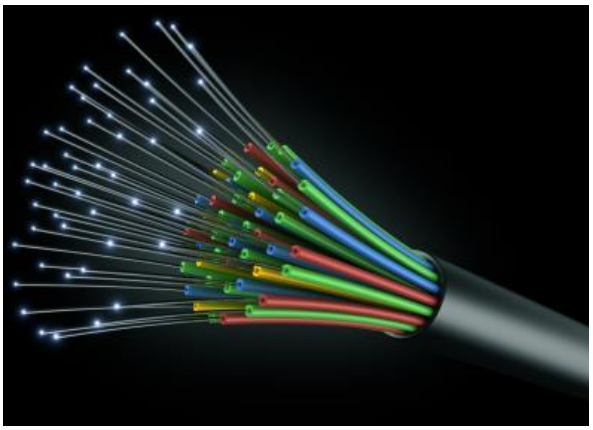


Router And Switch : Routers and switches are both computer networking devices that allow one or more computers to be connected to other computers, networked devices, or to othernetworks. The functions of a router, switch and hub and are all different, even if at times they are integrated into a single device.

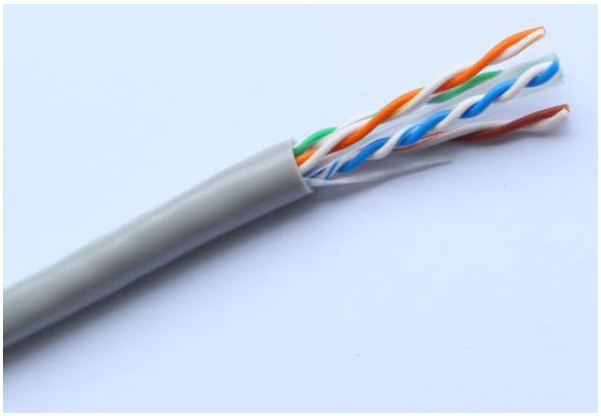


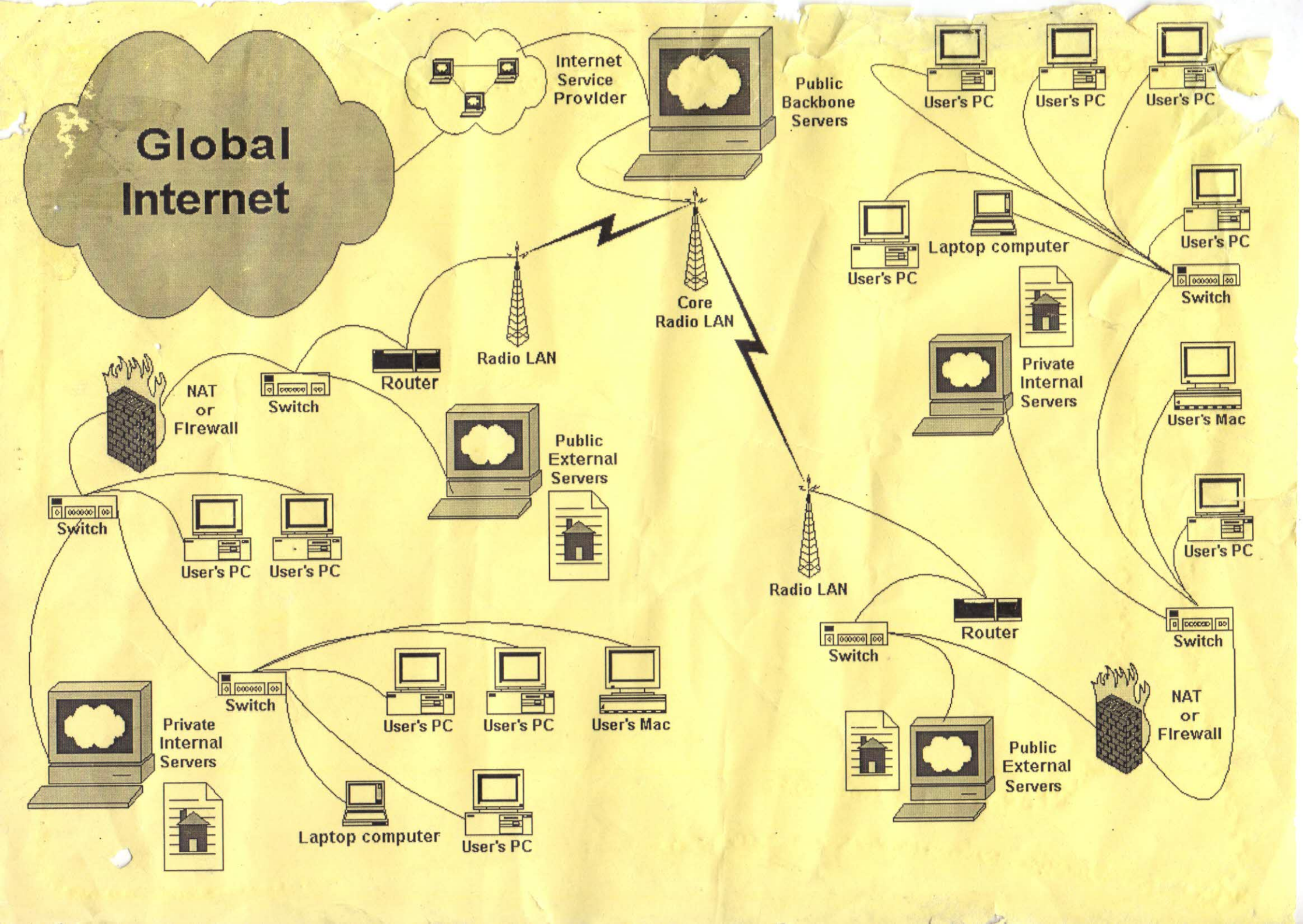
ISP : An **Internet service provider** (**ISP**) is an organization that provides services for accessing, using, or participating in the Internet. Like BSNL , Airtel, Jio, Idea, Vodaphone etc.

Fiber Optics



Ethernet Wire (LAN Cable)




Global Internet
Internet Service Provider
Public Backbone Servers
User's PC
User's PC
User's PC
User's PC
Laptop computer
User's PC
Switch
Core Radio LAN
Radio LAN
Router
NAT or Firewall
Switch
Private Internal Servers
User's Mac
Public External Servers
Switch
User's PC
User's PC
User's PC
Radio LAN
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