
COMPUTER AWARENESS
EPISODE-10
COMPUTER NETWORK & TOPOLOGY

CA FUNSTA
UNBOX THE NEW WAY OF LEARNING

Computer Awareness

Part 10

- Funsta Team

Lets Start

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Computer Awareness

Part 1 Intro/Generation/ Classification of Computers

Part 2 Computer Architecture & Memory

Part 3 Computer Hardware

Part 4 Computer Software and System Utilities

Part 5 Number System

Part 6 Computer Codes & Logic Gates

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Computer Awareness

Part 7 Introduction to Operating System

Part 8 Operating System

Part 9 Data Communication

Lets move on to
Next Part

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Computer Network

A Computer **network** consists of two or more **computers** that are linked in order to share resources (such as printers and CDs), exchange files, or allow electronic communications.

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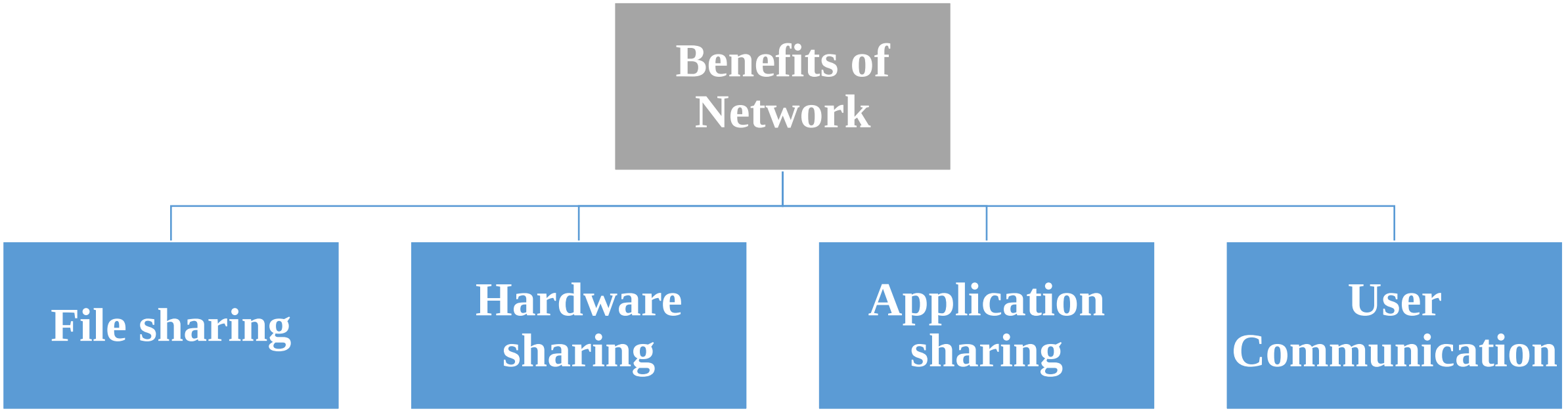
Benefits of Network

Benefits of Network



Back to Computer network

File sharing

You can easily **share** data between different users, or access it remotely if you keep it on other connected devices.

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Benefits of Network

Hardware sharing

Users share devices such as scanners, CD-ROM Devices, Hard drives, Printers etc., in a computer Network

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Application sharing

To **transfer** one **application** from one computer to another,
The **application** must reside on only one of the machines connected with each other.

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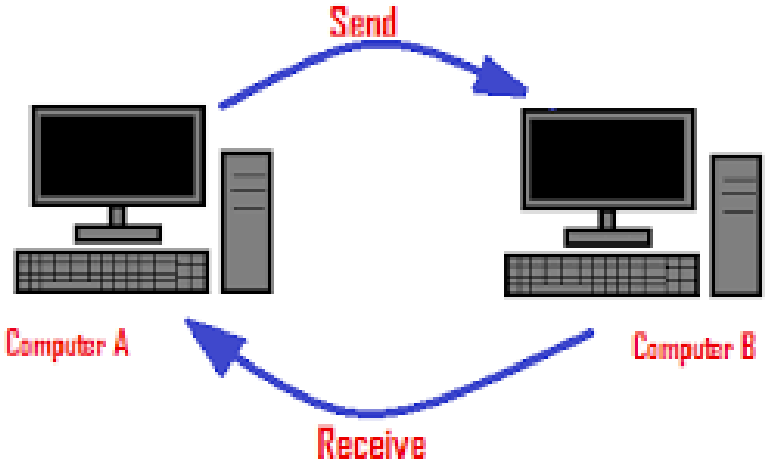
User Communication

User Communication Preferences allows a **user** who has access to multiple channels to control how, when, and where they receive messages.

Users define filters, or delivery preferences, that specify which channel a message should be delivered to, and under what circumstances.



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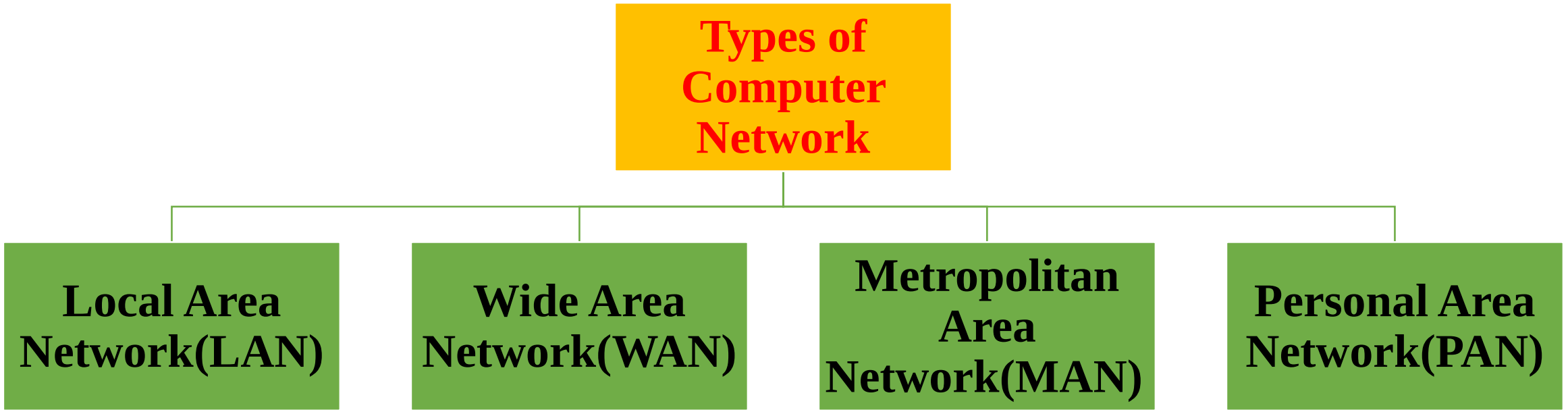
Benefits of Network

Types of Computer Network



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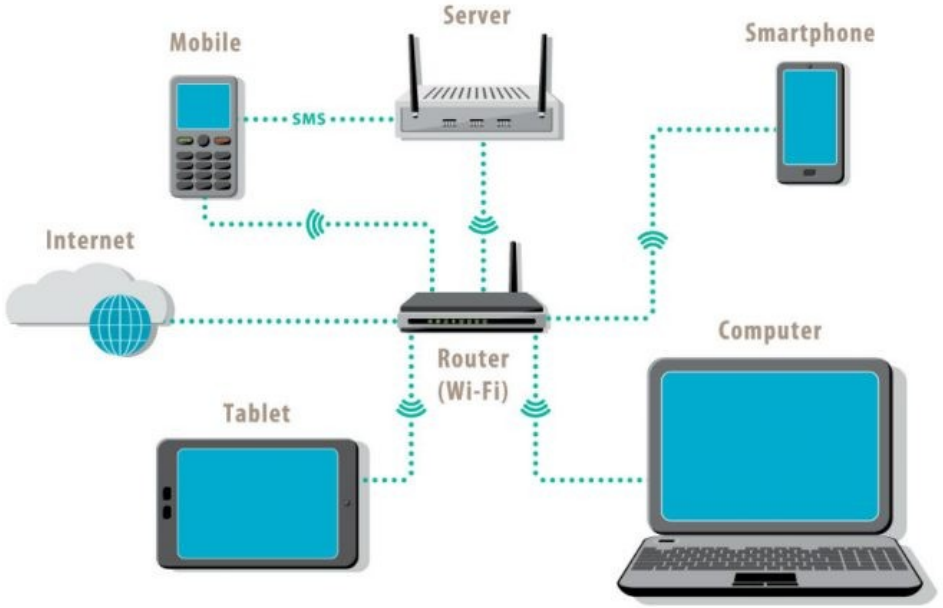
Local Area Network(LAN)

LAN (**local area network**) is where 2 or more computers/ laptops are connected to a router via an Ethernet cable or wirelessly via Wi-fi.

Some **examples** of **LAN** are : **Networking** between 2 computers. **Networking** in the home, school, library, laboratory, college/ university campus, or office.



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Types of Computer Network

Wide Area Network(WAN)

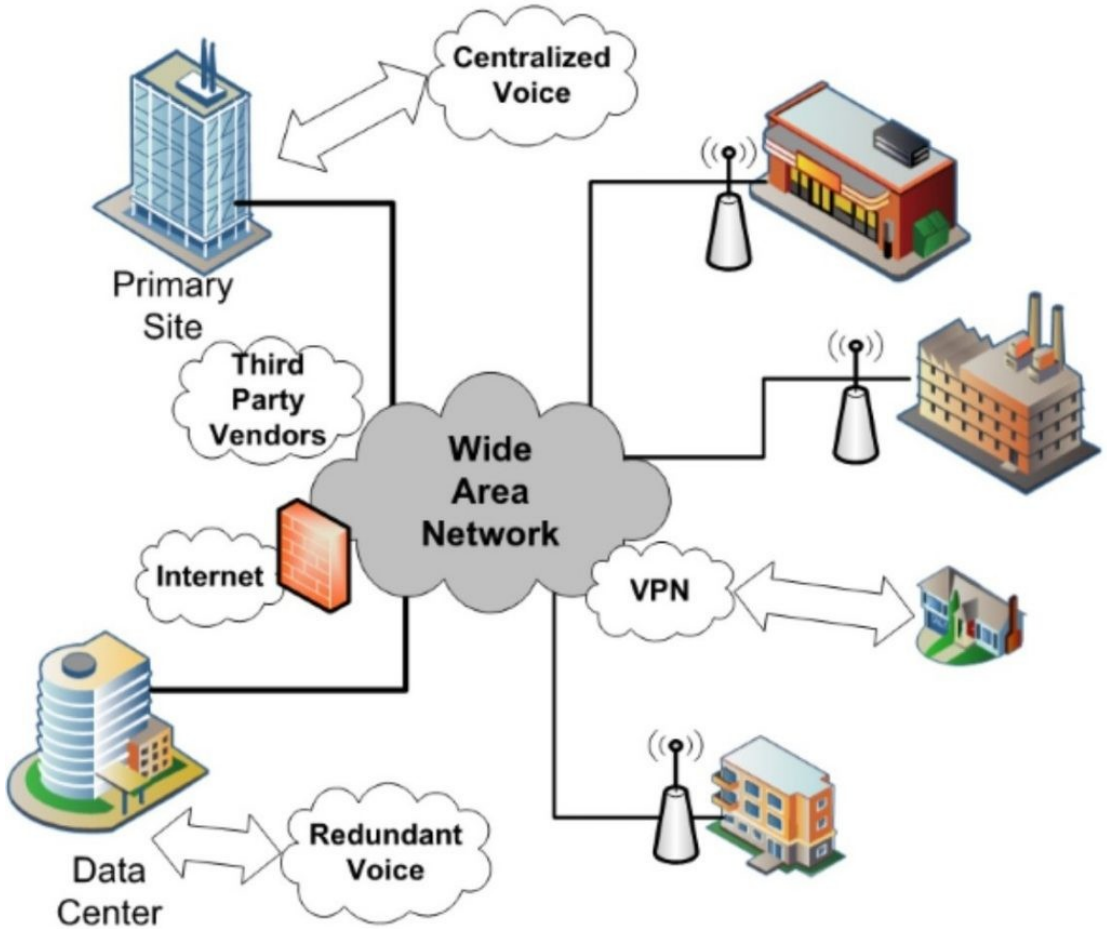
A **wide area network** (also known as **WAN**), is a large **network** of information that is not tied to a single location. WANs can facilitate communication, the sharing of information and much more between devices from around the world through a **WAN** provider.

The best example of a Wide Area Network is the **Internet** itself.

Other smaller examples of WANs are: A network of bank cash dispensers;
A Company network with several branch offices geographically distant.

Pictorial representation of Wide Area Network (WAN)

Wide Area Network(WAN)



Explanation of
Wide Area Network (WAN)

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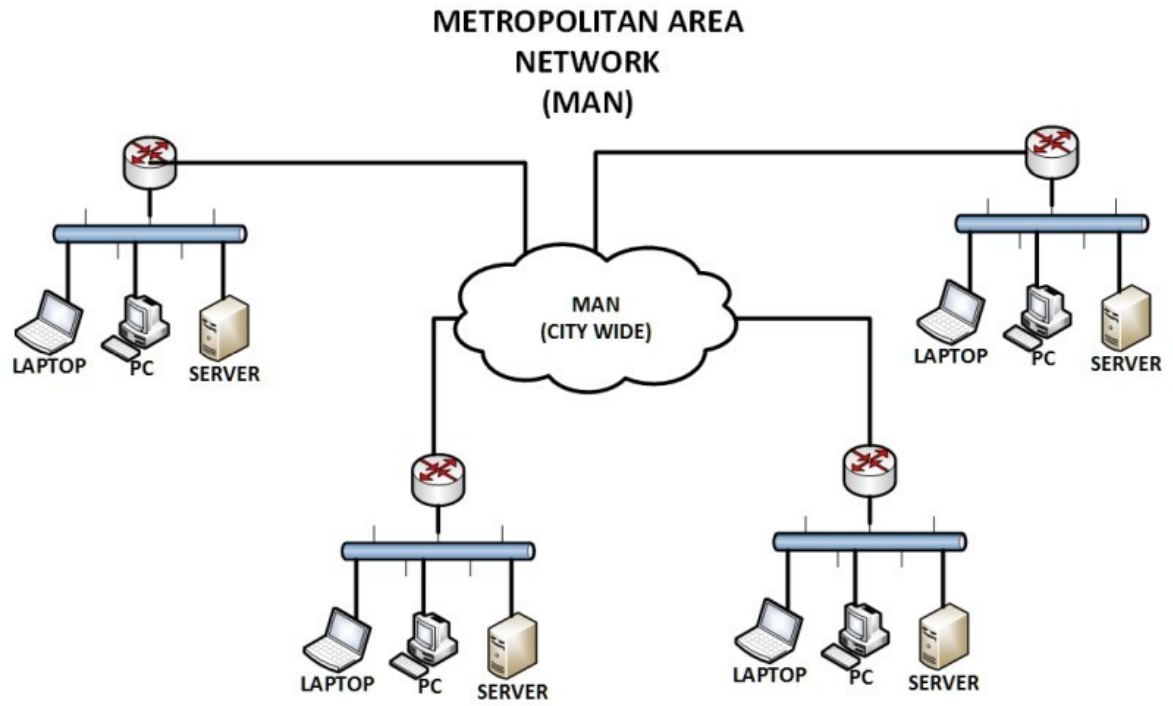
Types of Computer Network

Metropolitan Area Network(MAN)

A **metropolitan area network** (MAN) is a **network** that interconnects users with **computer** resources in a geographic **area** or region larger than that covered by even a large **local area network** (LAN) but smaller than the **area** covered by a wide **area network** (WAN).



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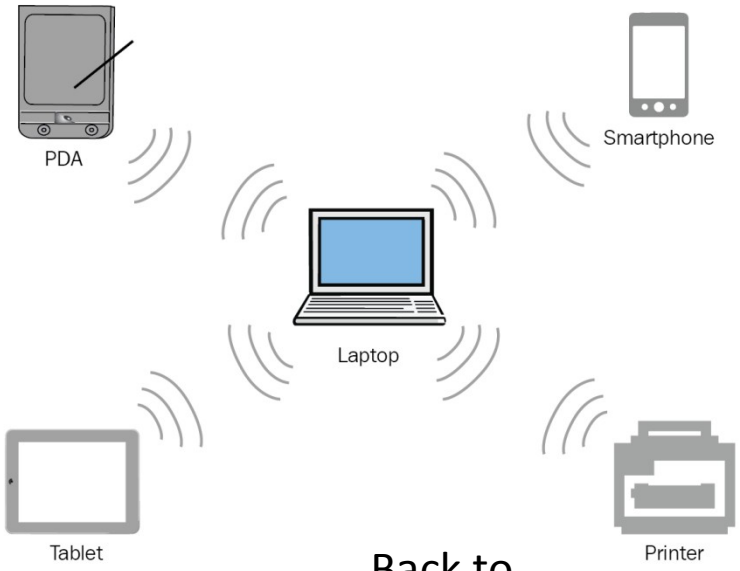
Personal Area Network(PAN)

- A **personal area network**, or PAN, is a **computer network** that enables communication between **computer** devices near a person.
- PANs can be wired, such as USB or FireWire, or they can be wireless, such as infrared, ZigBee, Bluetooth and ultrawideband, or UWB.
- The range of a PAN typically is a few meters



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Network Devices

- Networking hardware, also known as **network equipment** or computer networking devices, are electronic devices which are required for communication and interaction between devices on a computer network.
- Specifically, they mediate data transmission in a computer network

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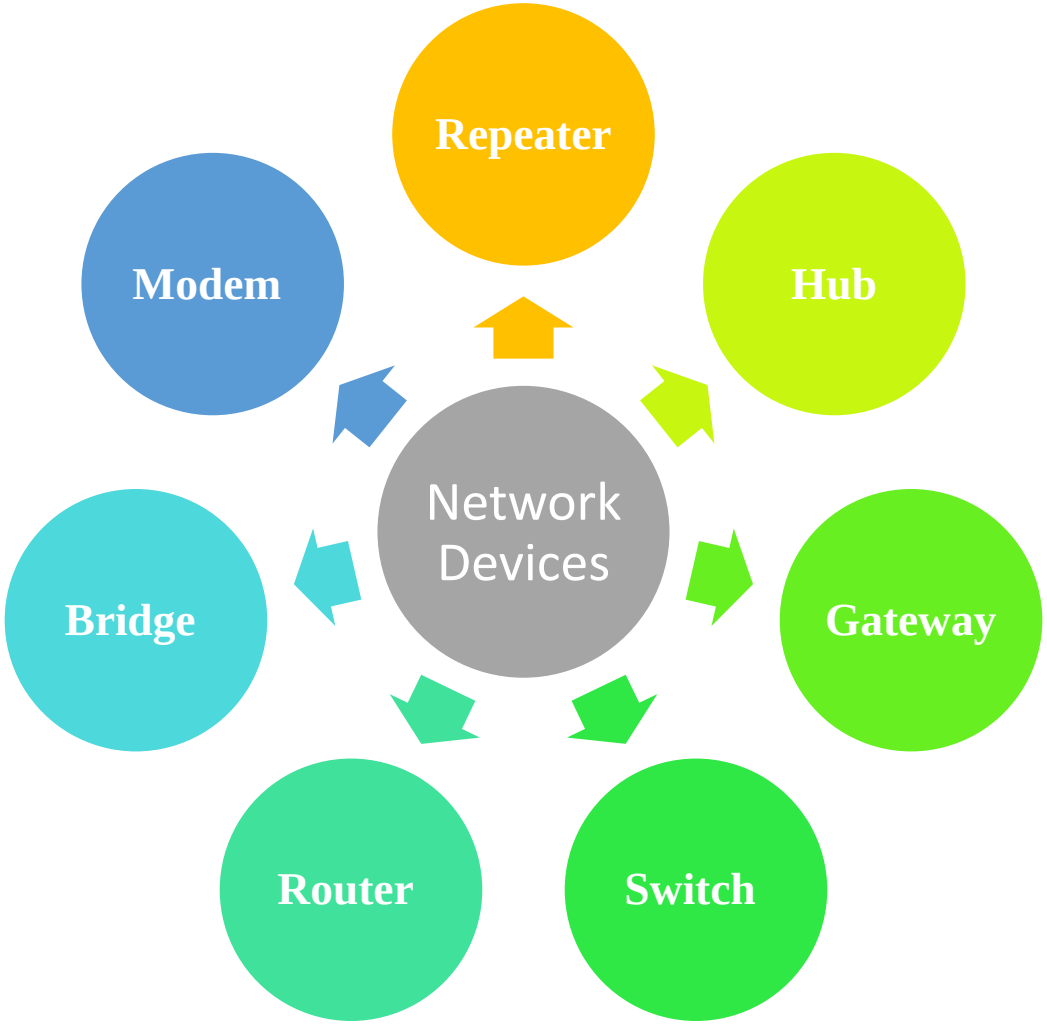
Types of Network Devices

Network Devices



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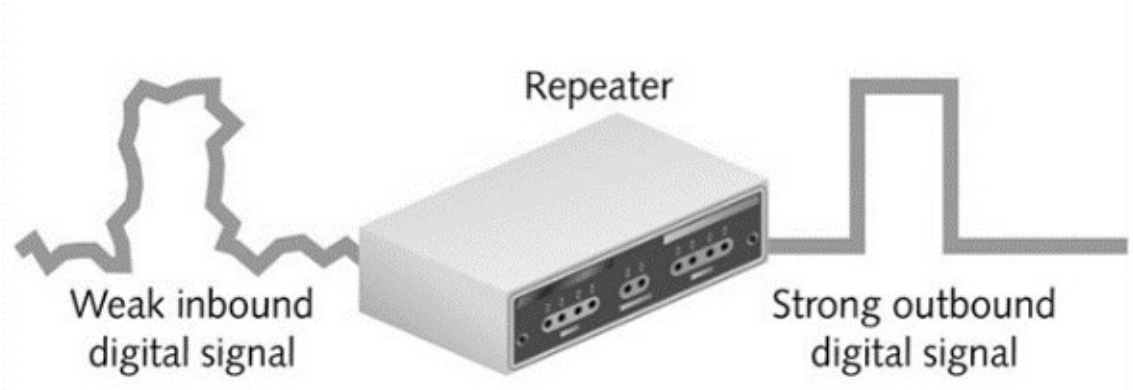
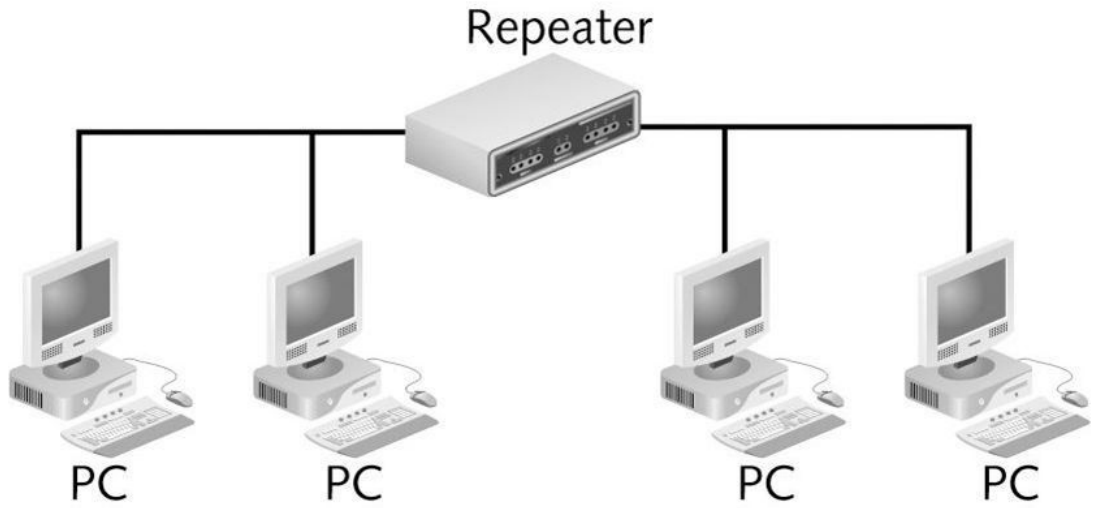
Repeater

- **Repeaters** are **network devices** operating at physical layer of the OSI model that amplify or regenerate an incoming signal before retransmitting it.
- They are incorporated in **networks** to expand its coverage area.
- They are also known as **signal boosters**





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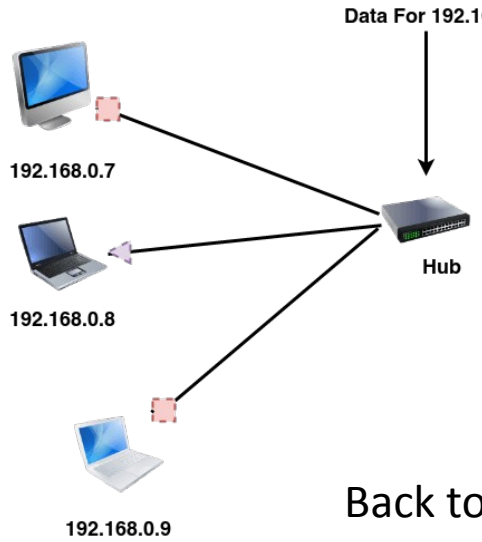
Hub

- A Hub is a common connection point for devices in a network
- It works at physical layer and hence connect networking devices physically together
- It contains multiple Ports
- When a packet arrives at one port, it is copied to the other ports so that all segments of the LAN can see all packets

Hub



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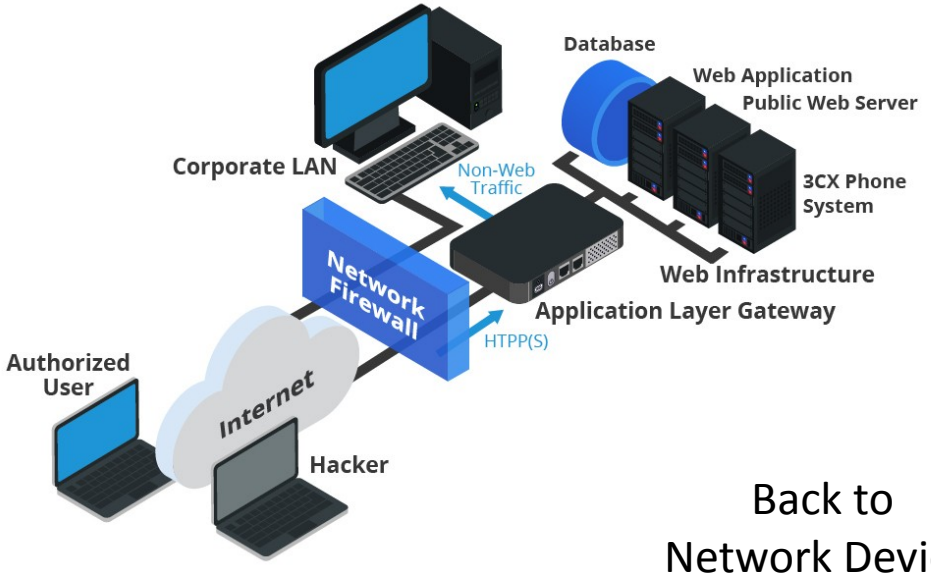
Gateway

- Gateway is a device which is used to connect **multiple Networks**
- A gateway is a network point that acts as an entrance to another Network
- It allows the computer programs, either on the same computer or on different computers to share information across the network through protocols
- A router is also a gateway, since it interprets data from one network protocol to another
- It is also called as protocol converter

Gateway



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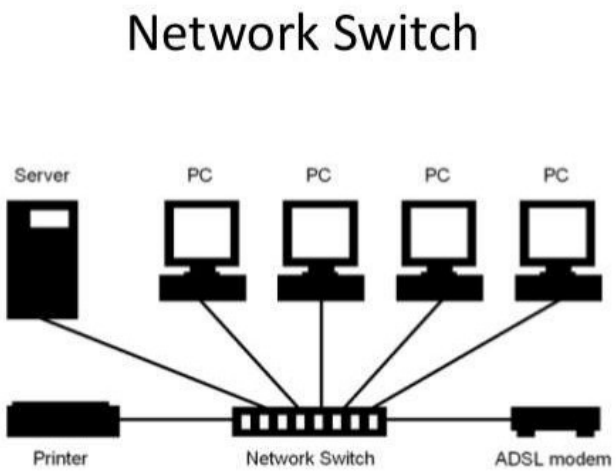
Switch

- A network switch is networking hardware that connects **devices on a computer network** by using packet switching to receive and forward data to the destination device.
- A network switch is a multiport network bridge that uses MAC addresses to forward data at the data link layer of the OSI model.

Switch



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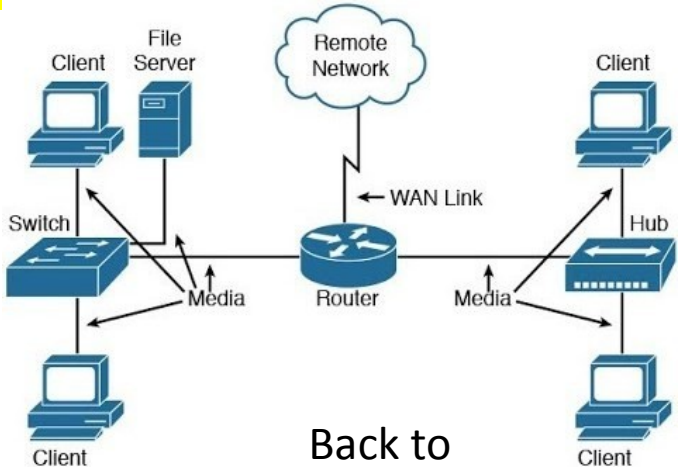
Router

- A **router** is a networking device that forwards data packets between computer networks.
- Routers perform the traffic directing functions on the Internet.
- Data sent through the internet, such as a web page or email, is in the form of **data packets**.
- A packet is typically forwarded from one router to another router through the networks that constitute an internetwork (e.g. the Internet) until it reaches its destination node

Router



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Modem

- Modem is a device which converts the computer-generated digital signals of a computer into **analog** signals to enable their travelling via phone lines.
- The '**modulator-demodulator**' or modem can be used as a **dial** up for LAN or to connect to an ISP.

Modem

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Network Topology

- Network topology is the arrangement of the elements of a communication network.
- Network topology can be used to define or describe the arrangement of various types of telecommunication networks, including command and control radio networks, industrial fieldbuses and computer networks

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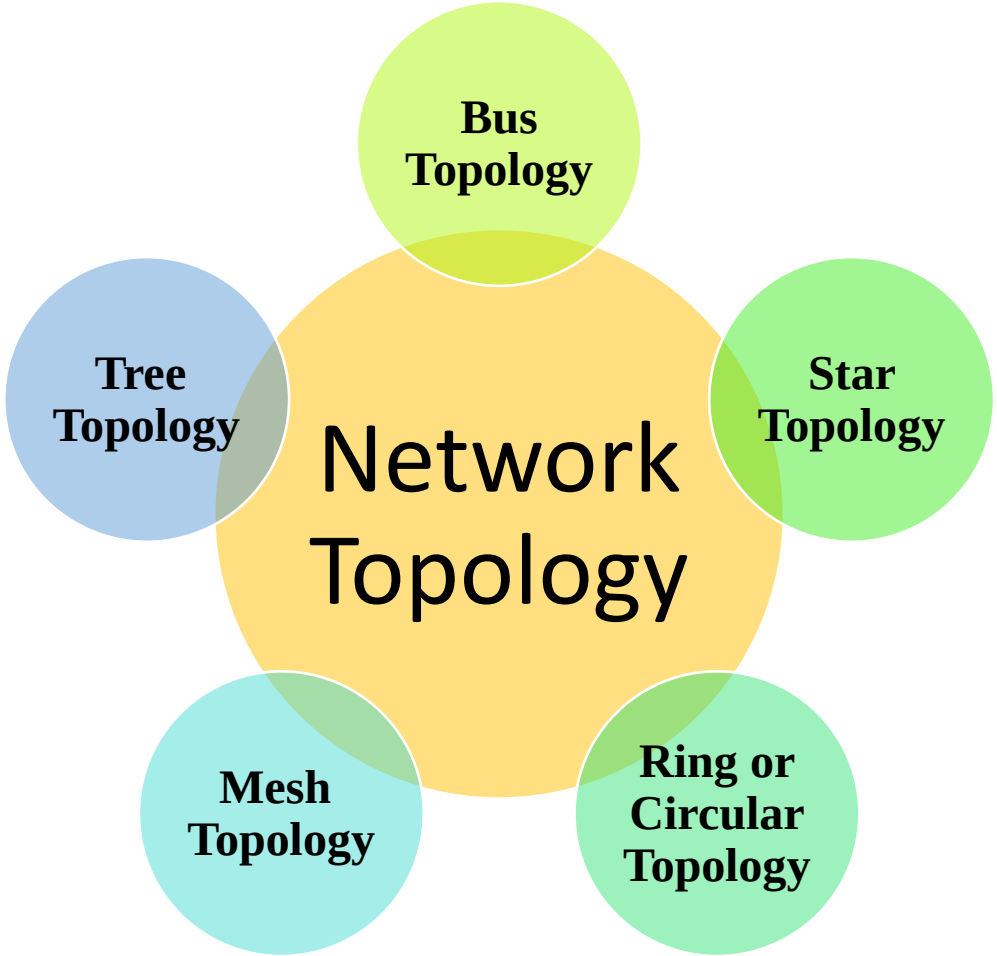
Types of Network Topology

Network Topology



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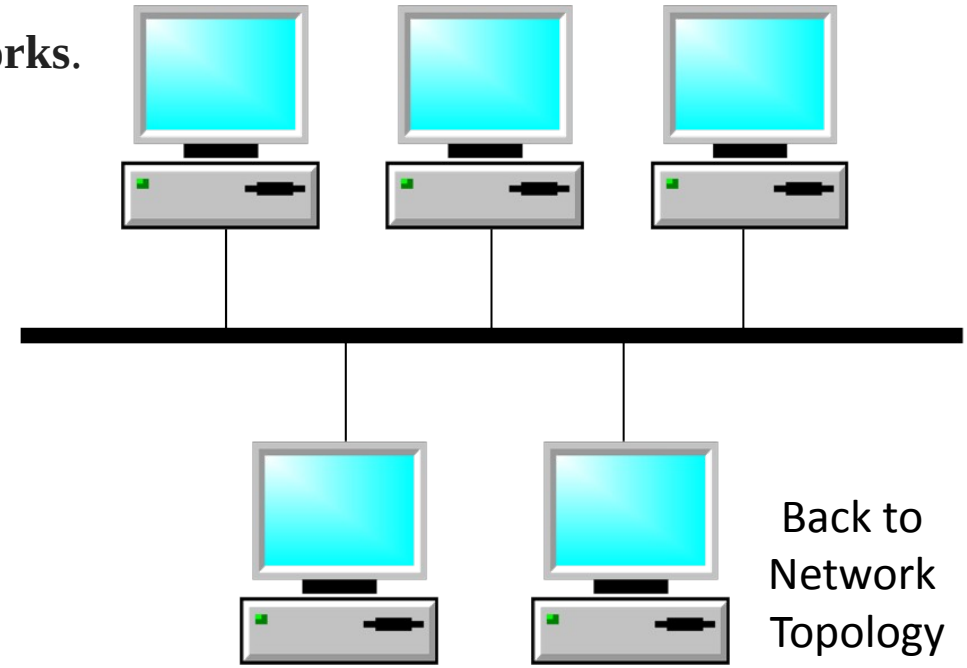
Bus Topology

- A **bus topology** is a **topology** for a Local Area **Network** (LAN) in which all the nodes are connected to a single cable.
- The cable to which the nodes connect is called a "**backbone**".
- If the backbone is broken, the entire segment fails.
- The **bus topology** is e.g. used by Ethernet **networks**.



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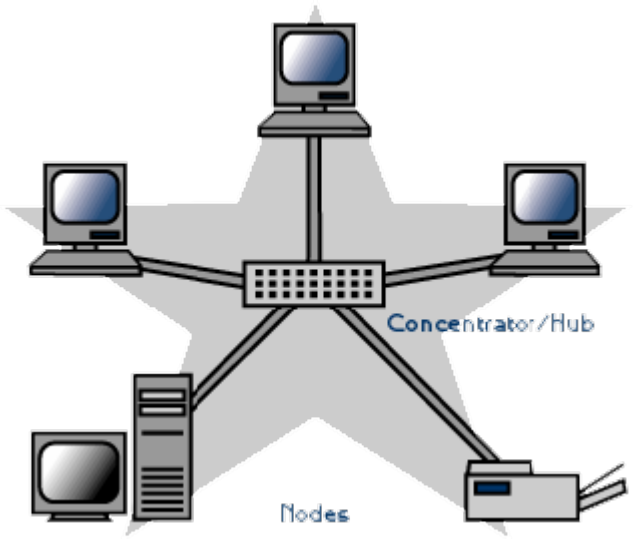
Star Topology

- A **star topology** is a **topology** for a Local Area **Network** (LAN) in which **all nodes are individually connected to a central connection point**, like a hub or a switch.
- A **star** takes more cable than e.g. a bus, but the benefit is that if a cable fails, only one node will be brought down.



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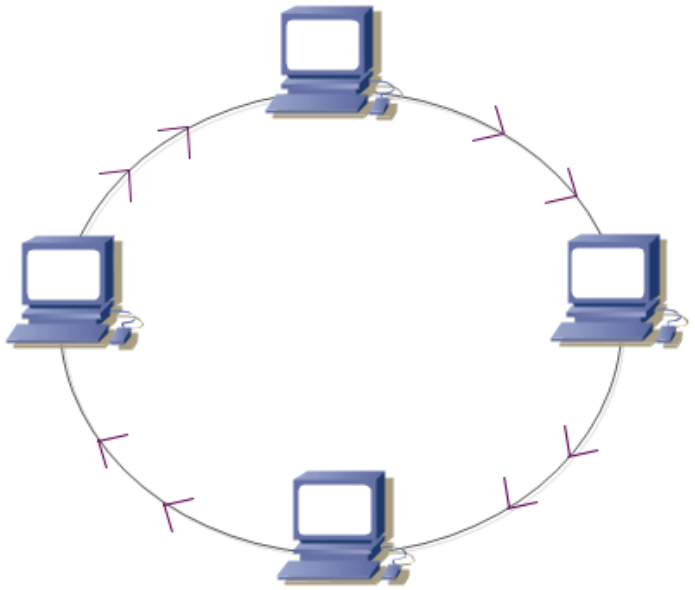
Ring or Circular Topology

- A **ring topology** is a **network** configuration where device connections create a **circular** data path.
- Each networked device is connected to two others, like points on a circle
- **Ring topologies** may be used in either LANs (local area **networks**) or WANs (wide area **networks**).
- **Adding and trouble shooting is a problem**



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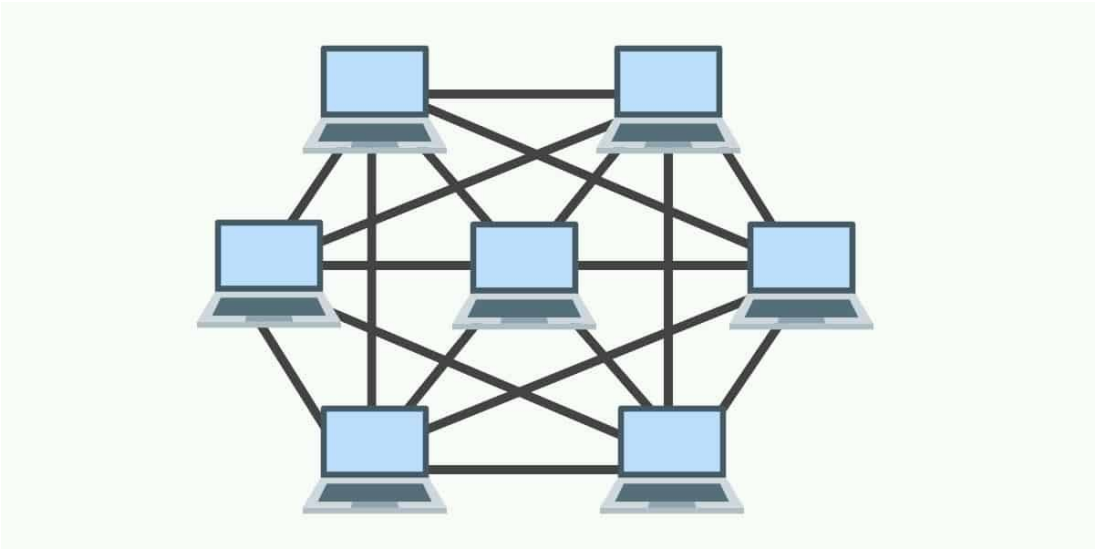
Mesh Topology

- **Mesh topology** is a type of **networking** where all nodes cooperate to distribute data amongst each other.
- This **topology** was originally developed 30+ years ago for military applications, but today, they are typically used for things like home automation, smart HVAC control, and smart buildings.
- It is also called as **completely Interconnected topology**



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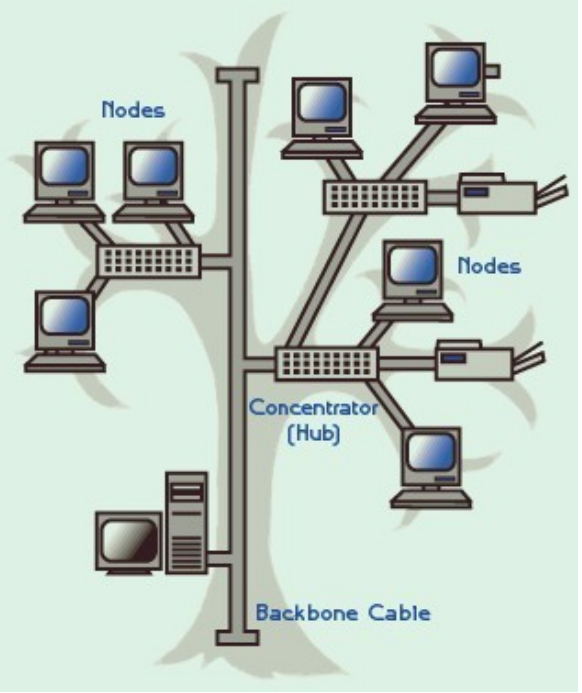
Tree Topology

- A **tree network**, or star-bus **network**, is a hybrid **network topology** in which star **networks** are interconnected via bus **networks**.
- **Tree networks** are hierarchical, and each node can have an arbitrary number of child nodes.



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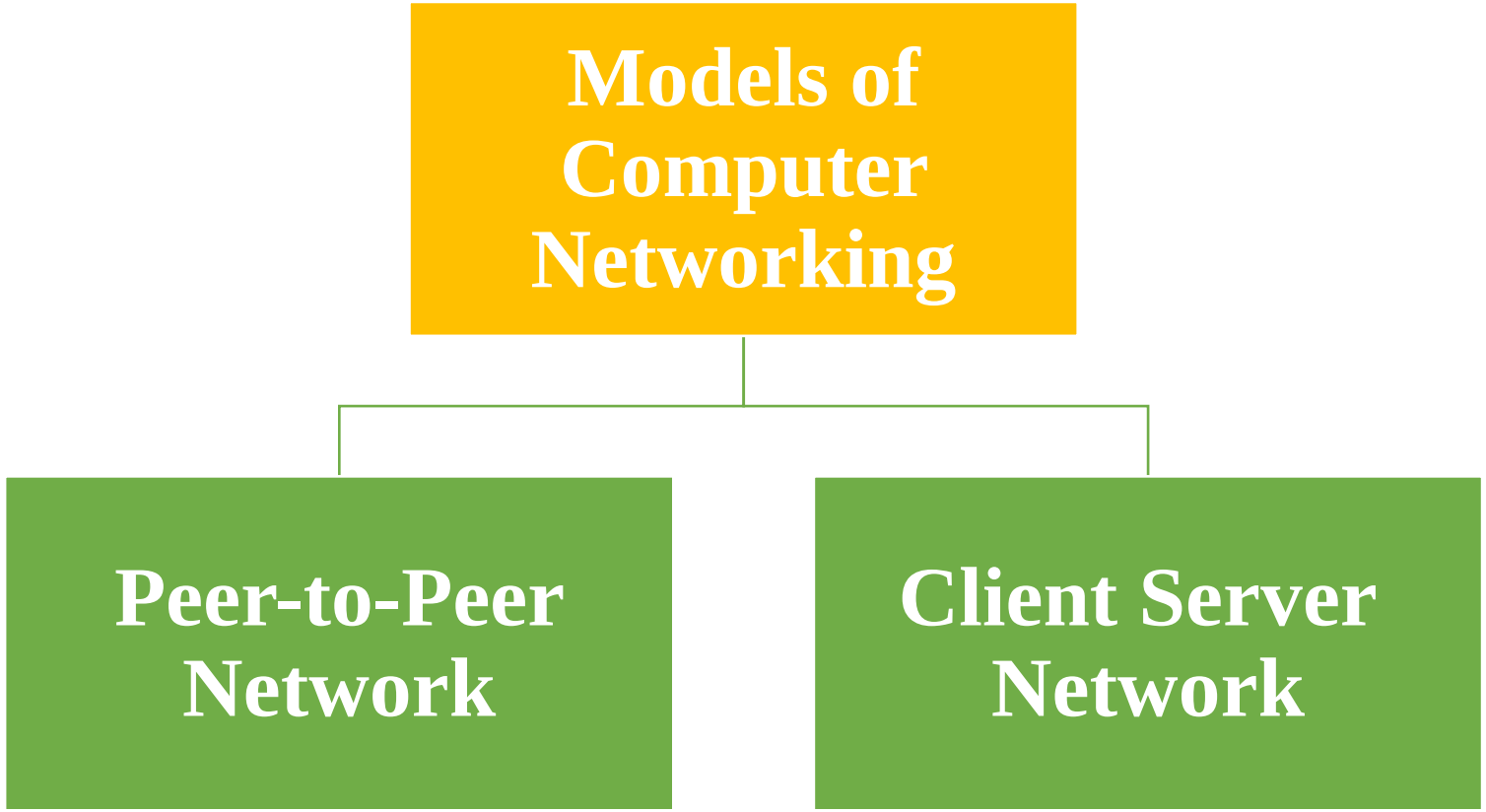
Models of Computer Networking



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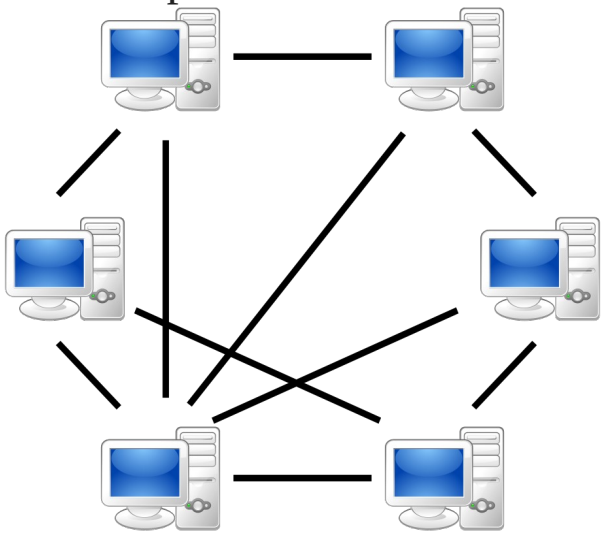
Peer-to-Peer Network

- In a **P2P network**, the "**peers**" are computer systems which are connected to each other via the Internet.
- Files can be shared directly between systems on the **network** without the need of a central server.
- In other words, each computer on a **P2P network** becomes a file server as well as a client.



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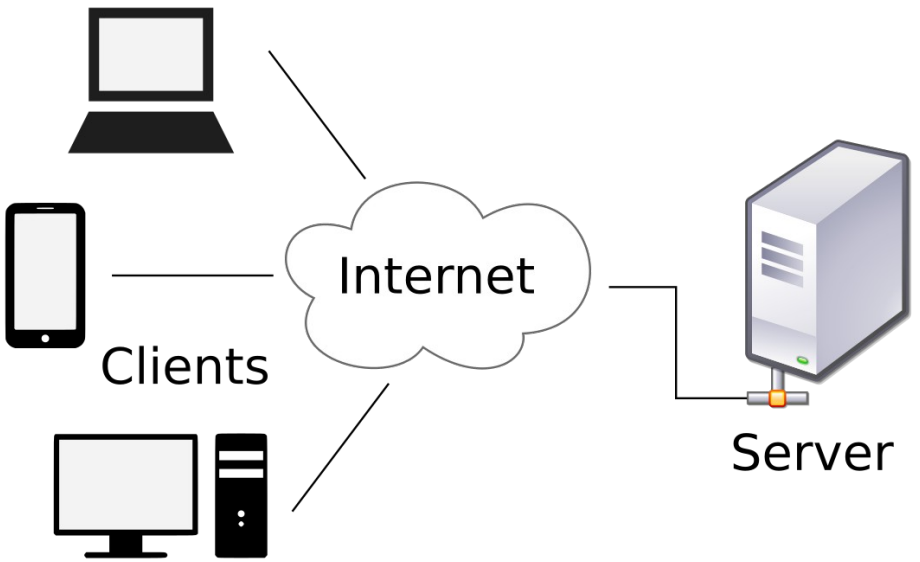
Client Server Network

- A computer network in which one centralized, powerful computer (called the server) is a hub to which many less powerful personal computers or workstations (called clients) are connected.
- The clients run programs and access data that are stored on the server.
- Compare peer-to-peer network.

High cost

Need an expert or admin



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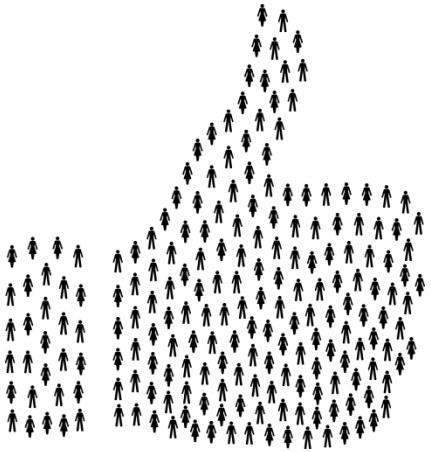
‘Hurrah!’
We completed this section



Coming Soon...