UNIT-II

Basic organization and N/W Fundamentals:

Computer Organization: Functional components-Input/Output devices, Storage types, Memory hierarchy.

Types of Computers: Micro, Mini, Mainframe and Super Computers.

Networking Fundamentals: Definition, need for networks types(LAN, WAN, MAN), topology (Star, Ring, Bus).

Internet Basics: IP Address, Domain Name, Web Browser, Email, WWW.

INPUT DEVICES

Definition:

Input devices are hardware components that allow users to enter data, instructions, or commands into a computer system. These devices act as a bridge between the user and the computer, helping the system to receive data for processing.

Types of Input Devices:

1. Keyboard

• The keyboard is the most common input device used to enter text, numbers, and commands.

• It contains keys for letters (A–Z), numbers (0–9), function keys (F1–F12), and special keys like Enter, Shift, Ctrl, and Alt.

2. Mouse

• The mouse is a pointing device used to control the movement of a pointer on the screen.

• It allows users to click, drag, and drop items and navigate the graphical user interface (GUI).

3. Scanner

• A scanner converts printed text, photos, or documents into digital format.

• It uses optical technology to capture images and store them on the computer.

4. Microphone

• A microphone is used to input sound into the computer.

• It converts sound waves into electrical signals that the computer can process.

5. Webcam

• A webcam captures live video and images.

• It is commonly used for video conferencing, online classes, and live streaming.

6. Joystick

• A joystick is mainly used for gaming and controlling simulations.

• It has a stick that moves in all directions to control on-screen objects.

7. Light Pen

• A light pen is a pointing device that detects light from the computer screen.

• It is used for drawing or selecting objects on the display.

8. Barcode Reader

• A barcode reader scans and reads information from barcodes printed on products.

• It is widely used in retail stores and inventory management.

9. Biometric Devices

• Biometric devices identify individuals based on physical characteristics like fingerprints, face, or iris.

OUTPUT DEVICES

Definition:

Output devices are hardware components that display or present the processed data (information) from the computer to the user. They convert the computer's digital data into human-understandable form such as text, images, sound, or video.

Types of Output Devices:

1.Monitor(Visual Display Unit)

•The monitor is the most common output device that displays text, images, videos, and other visual data.

• It looks like a TV screen and is also known as a Visual Display Unit (VDU).

Types of Monitors:

- **CRT (Cathode Ray Tube):** Old bulky monitors used earlier.

- **LCD (Liquid Crystal Display):** Thin and flat screen, uses less power.
- **LED (Light Emitting Diode):** Advanced version of LCD, provides better clarity and
- brightness.

2. Printer

A printer is used to produce a hard copy (printed copy) of documents or images on paper.

Types of Printers:

- Impact Printers: Characters are printed by striking an inked ribbon.
  ▪ Examples: Dot Matrix Printer, Daisy Wheel Printer
- Non-Impact Printers: No physical contact with the paper; faster and quieter.
  ▪ Examples: Inkjet Printer, Laser Printer

3. Speaker

- Speakers are output devices that convert electrical signals into sound waves.
- They are used to play music, system sounds, or voice outputs.

4. Headphones / Earphones

- These are personal audio output devices used for private listening.
- They work like speakers but deliver sound directly to the user's ears.

5. Projector

- A projector displays computer output on a large screen or wall.
- It is used for presentations, seminars, and movie screenings.

6. Plotter

- A plotter is a specialized printer used for producing large-sized drawings, maps, and engineering blueprints.
- It uses pens to draw continuous lines with high precision.

7. LED Display Boards

- These are electronic boards that display messages, advertisements, or notifications using LED lights.

8. Braille Display (for the visually impaired)

- A Braille display converts text on the screen into Braille characters (raised dots) so that blind users can read through touch.

STORAGE TYPES

Definition:

Storage devices are hardware components used to store data, instructions, and information permanently or temporarily.

Types of Storage

There are three main types of computer storage:

1. Primary Storage (Main Memory)

2. Secondary Storage (External or Auxiliary Storage)

3. Tertiary and Cloud Storage (Advanced/Modern Storage)

1. Primary Storage (Main Memory)

- This is the internal memory of the computer.
- It stores data and instructions that are currently being processed by the CPU.
- It is fast but has limited capacity and is volatile (data is lost when power is off).

Types of Primary Storage:

a) RAM (Random Access Memory)

- Also known as temporary memory or volatile memory.
- It stores the data and instructions the CPU needs while performing tasks.
- Once the computer is turned off, all data in RAM is erased.

b) ROM (Read Only Memory)

- Non-volatile memory — data remains even after the power is turned off.
- It contains permanent instructions used to start (boot) the computer.

2. Secondary Storage (External or Auxiliary Memory)

- Used for long-term data storage.
- It is non-volatile, meaning data is not lost when power is turned off.
- It stores large amounts of data permanently.

Types of Secondary Storage:

a) Hard Disk Drive (HDD)

- Most common secondary storage device.

- Stores the operating system, software, and user data.
- Data is stored magnetically on spinning disks.
  Example: Computer's main storage (C: drive).

b) Solid State Drive (SSD)

- A faster alternative to HDDs.
- Uses flash memory instead of moving parts, making it faster and more reliable.
  Example: Modern laptops and gaming PCs.

c) Optical Discs

- Data is stored and read using a laser beam.
- Types: CD (700 MB), DVD (4.7 GB–8.5 GB), Blu-ray (25–50 GB).
  Example: Movie DVDs, software CDs.

d) Pen Drive / USB Flash Drive

- Portable, plug-and-play device used to transfer files between computers.
- Storage capacity: from 4 GB to 1 TB.
  Example: Used for backups and file transfers.

e) Memory Card

- Small storage device used in mobile phones, cameras, and tablets.
  Example: SD cards in smartphones or cameras.

f) Magnetic Tape

- Long plastic tape coated with magnetic material.
- Used for large-scale data backup and archiving.
  Example: Used in data centers and mainframes.

3. Tertiary and Cloud Storage

- **Tertiary Storage**: Used for backup and archival purposes, often involving robotic systems to load and unload data media.
  Example: Tape libraries used by big organizations.
- **Cloud Storage:** Data is stored on remote servers accessed via the internet.
  Provides scalability, flexibility, and accessibility from anywhere.
  Examples: Google Drive, Dropbox, OneDrive.

Memory Hierarchy

Definition:

The memory hierarchy in a computer system is the arrangement of different types of storage (memory)

based on speed, cost, and size.

It helps the CPU access data efficiently — the faster (but smaller and more expensive) memories are placed

close to the CPU, while slower (but larger and cheaper) memories are placed farther away.

1. CPU Registers

• Fastest and smallest type of memory.

• Located inside the CPU itself.

• Used to store temporary data, instructions, and addresses currently being processed.

• Access time is 1 nanosecond or less.

• Example: Accumulator, Program Counter, Instruction Register.

Speed: Very High

Capacity: Very Low

Cost: Very Expensive

2. Cache Memory

• A small, high-speed memory located between the CPU and main memory.

• Stores frequently used instructions and data to reduce CPU access time to RAM.

• Managed automatically by the CPU using a principle called locality of reference (reusing recent data).

Speed: Very High

Capacity: Low (2–16 MB typically)

Cost: High

3. Main Memory (Primary Memory / RAM)

• Stores programs and data currently in use.

• Volatile memory — data is lost when the power is turned off.

• Acts as a bridge between CPU and secondary storage.

• Faster than disks but slower than cache.

• Example: DDR4/DDR5 RAM.

Speed: Moderate

Capacity: Medium (4 GB to 64 GB)

Cost: Moderate

4. Secondary Storage

• Used for long-term storage of data and programs.

• Non-volatile — data is retained even when power is off.

• Slower than RAM and cache but has high storage capacity.

• Examples: Hard Disk Drive (HDD), Solid State Drive (SSD).

Speed: Slow

Capacity: High (GBs to TBs)

Cost: Low

5. Tertiary / Cloud Storage

• Used for data backup, archival, and remote storage.

• Very large capacity but slow access speed.

• Examples: Magnetic tapes, optical drives, cloud storage (Google Drive, AWS, etc.)

Speed: Very Slow

Capacity: Very High (TBs to PBs)

Cost: Very Low per GB

TYPES OF COMPUTERS

Computers are classified into four main types based on their size, processing speed, storage capacity, and the number of users they can support:

1. Microcomputer

Micro computer is also called PC (Personal Computer) because it is used by a single person at a time. It is the smallest, cheapest, and most commonly used type of computer. Microprocessor is used as main processing unit (CPU). IBM-PC was the first microcomputer designed by IBM (International Business Machine) company. Microcomputers are used in the home, school, college, hospital, office, etc. for data processing purpose.

Examples:

Desktop computers, Laptops, Tablets, Smartphones.

Features:

- Single-user system
- Easy to use and portable (laptops, tablets)
- Low cost and maintenance
- Moderate processing speed

  Used in: Schools, homes, small offices, and shops.

2. Minicomputer

Minicomputer is more powerful and expensive than microcomputer but less powerful and costly than mainframe computer. So, the capabilities of a minicomputer are in between microcomputer and mainframe computer. Minicomputer is used in data processing, business transactions, and small organization management. scientific research, banking system, telephone switch, etc. These computers work on multiprocessing system and about two hundred of PCs can be connected to the network.

Examples:

PDP-11, VAX 750, IBM AS/400.

Features:

- Multi-user support through terminals
- Larger memory and speed than microcomputers
- Used for small-scale servers or departmental computing
- Costlier than microcomputers but cheaper than mainframes

  Used in: Small companies, colleges, research labs.

3. Mainframe Computer

Mainframe computer are more powerful, have large storage capacity and more expensive than minicomputer but less powerful and costly than supercomputer. These computers allows multi-user and have multi-processor and support more than 200 PCs. These computers are used as a server on WWW and also used in large organizations such as banking, railways, government, bank, telecommunication, airlines, universities and insurance sectors for large data processing where continuous data processing is needed.

Examples:

IBM zSeries, UNIVAC 1100, Hitachi Z800.

Features:

- Handles multiple tasks and users at once
- High processing speed and storage capacity
- Very expensive
- Requires special environment (cooling systems, power backup)
  Used in: Banks, airlines, government departments, and large corporations.

4. Supercomputer

Supercomputers are the most powerful, most expensive and have the highest processing speed more than other computers. It has parallel processing for performing any task. These computers are mainly used in weather forecasting, nuclear energy research, national security, space-related research, artificial intelligence etc. Supercomputer can perform more than one trillion calculations per second.

Examples:

PARAM (India), CRAY, IBM Summit, Fugaku (Japan).

Features:

- Extremely high speed and accuracy
- Very expensive and power-consuming
- Requires advanced cooling systems
- Used by research institutions and government organizations
  Used in: Space research, weather prediction, defense research, scientific simulations.

COMPUTER NETWORK

A computer network is a system that connects two or more computers or devices together so they can communicate, share resources, and exchange data.

These connections can be made using cables (wired) or wireless technologies like Wi-Fi or Bluetooth.

In simple terms:

A network is a group of interconnected computers that share information and resources such as files, printers, or the internet.

Need for Computer Networks:

1**. Resource Sharing:**

Users can share hardware (like printers, scanners) and software resources among computers.

Example: A printer connected to one computer can be used by others in the same office.

2. File and Data Sharing:

Enables users to share files, databases, and information easily between systems.

Example: Students sharing project files through a campus network.

3. Communication:

Provides communication through emails, chats, video calls, and conferencing.

Example: Zoom meetings, WhatsApp messaging, Gmail.

4. Centralized Data Management:

Data can be stored in a central server and accessed by authorized users, ensuring consistency and security.

5. Backup and Security:

Networks help in keeping backup copies and applying security controls like authentication and encryption.

6. Cost Efficiency:

Sharing resources reduces the need for duplicate devices, saving money.

7. Scalability and Flexibility:

Easy to add new computers or devices to the existing network.

Types of Networks

Computer networks are categorized by size, technology, and the purpose.

Computer networks are mainly classified into LAN, MAN, and WAN.

1. LAN (Local Area Network)
2. MAN(Metropolitan Area Network)
3. WAN(Wide Area Network)

LAN (Local Area Network):

A Computer network spanned inside a building and operated under single administrative system is generally termed as Local Area Network (LAN). LAN covers an organization offices, schools, colleges or universities.

LAN provides a useful way of sharing the resources between end users. The resources such as printers, file servers, scanners, and internet are easily sharable among computers.

Features:

- Covers up to a few kilometers.
- High data transfer speed (up to 1 Gbps or more).
- Owned and managed by a single organization.
- Uses Ethernet cables or Wi-Fi.

Example:

- Computers connected in a school lab or office.

Advantages:

- High speed and reliability.
- Easy to set up and maintain.
- Cost-effective.

2. MAN (Metropolitan Area Network)

The Metropolitan Area Network generally expands throughout a city such as cable TV network. It can be in the form of Ethernet, Token-ring, ATM, or Fiber Distributed Data Interface (FDDI).

MAN works in between Local Area Network and Wide Area Network. MAN provides uplink for LANs to WANs or internet.

Features:

- Range: Up to 50 kilometers.
- Connects multiple LANs using high-speed fiber cables.
- Used by organizations or ISPs (Internet Service Providers) to link city networks.

Example:

- Cable TV network, city-wide Wi-Fi, or a university campus network spread across a city.

Advantages:

- Covers large areas at high speed.
- Provides interconnection between offices in the same city.

3. WAN (Wide Area Network)

Definition: A Wide Area Network (WAN) covers a very large geographical area, such as a country or the entire world. It connects multiple LANs and MANs through satellites, telephone lines, or fiber-optic cables.

Features:

- Long-distance data transmission.
- Low data transfer speed compared to LAN/MAN.
- Uses public communication links (like the internet).
- Managed by multiple organizations or ISPs.

Example:

- The Internet is the largest example of WAN.

Advantages:

- Enables global communication and data sharing.
- Supports remote working and international businesses.

Introduction to Network Topology:

Definition:

Network topology is the arrangement of different elements (links, nodes, devices) in a computer network. It defines how computers, cables, switches, routers, and other devices are connected and communicate with each other.

Types:

- Physical topology – the actual physical layout of the devices and cables.
- Logical topology – the way data flows within the network.

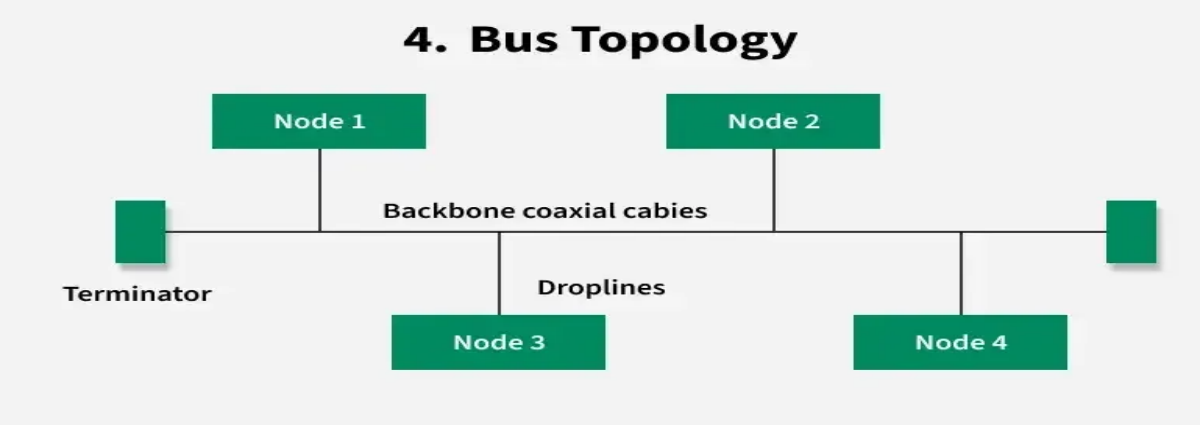
Types of Network Topologies

Bus Topology

A Bus topology is a network topology in which nodes are directly connected to a single cable called bus. In a bus network, every station will receive all network traffic, and the traffic generated by each station has equal transmission priority.

Description:

- All devices share a single communication line (the bus).
- Terminators are used at both ends to stop signal reflection.
- Devices tap into the cable to send and receive data.



Advantages:

- Easy to implement and extend.
- Requires less cable than other topologies.
- Cost-effective for small networks.

Disadvantages:

- Entire network shuts down if the main cable fails.
- Difficult to troubleshoot.
- Limited cable length and number of nodes.
- Slower performance with heavy traffic.

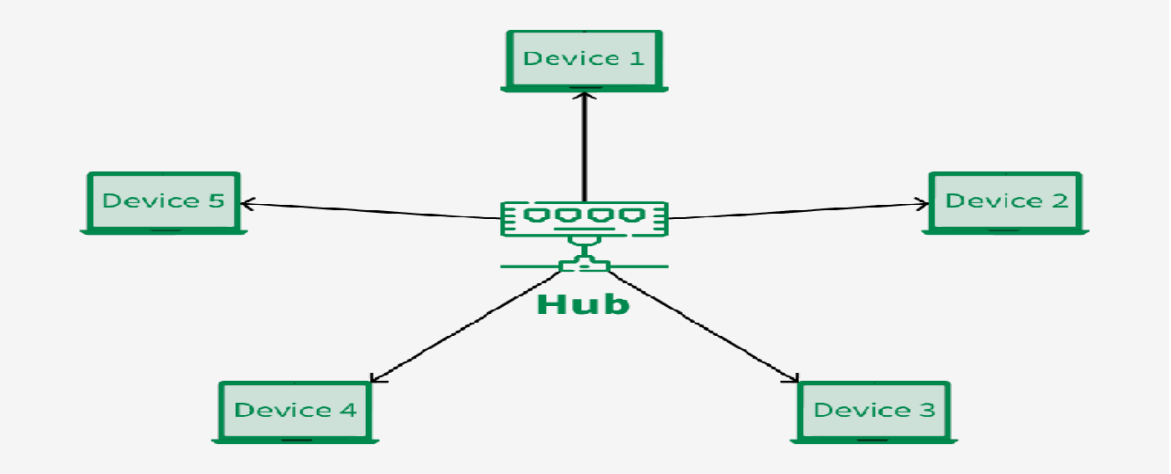
Use Case: Early LANs, small office networks.

Star Topology

A star topology is a network setup in which each device is connected to a central node called a hub. The hub manages the data flow between the devices. If one device wants to send data to another device, it has to first send the information to the hub, and then the hub transmits that data to the required device.

Description:

- All devices are connected to a central hub/switch/router.
- Communication goes through the central node.



Advantages:

- Easy to install and configure.
- Fault isolation is simple.
- One device failure doesn’t affect the others.
- Easy to scale.

Disadvantages:

- Failure of the hub disables the whole network.
- More cabling required than bus topology.
- Hub can be expensive in large networks.

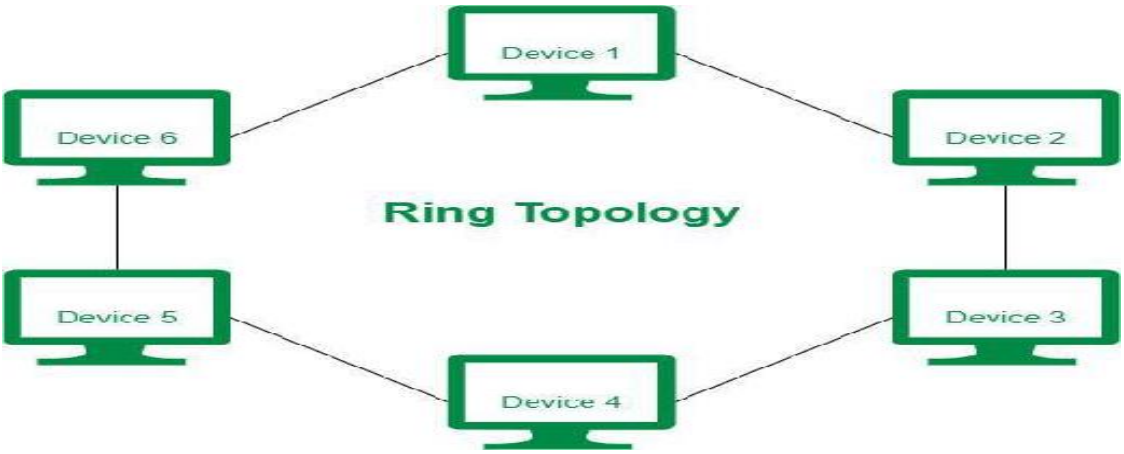
Use Case: Common in homes, offices, and schools.

Ring Topology:

A ring network is one where all workstations and other devices are connected in a continuous loop. There is no central server.

Description:

- Devices are connected in a circular fashion.
- Each device has exactly two neighbors.
- Data travels in one direction (or both in dual ring).



Advantages:

- Data packets travel at high speed.
- No collisions due to token-based transmission.
- Equal access for all devices.

Disadvantages:

- Failure in any cable/device breaks the loop.
- Difficult to reconfigure or troubleshoot.
- Adding/removing devices disrupts the network.

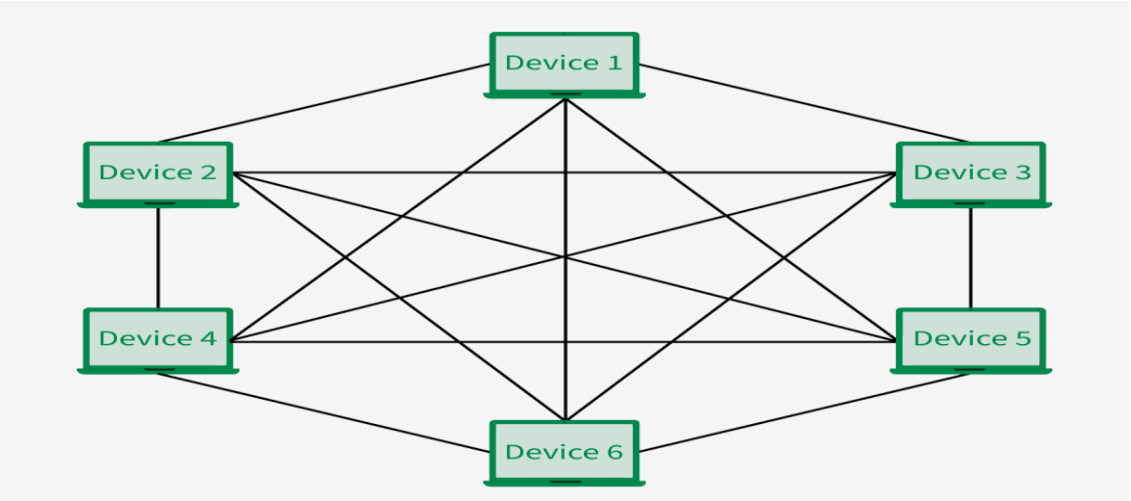
Use Case: Some MANs, FDDI (Fiber Distributed Data Interface).

Mesh Topology:

It is a point-to-point connection to other nodes or devices. Traffic is carried only between two devices or nodes to which it is connected. Mesh has n(n-2)/2 physical channels to link devices.

Description:

- Every device is connected to every other device.
- Provides multiple paths for data to travel.



Advantages:

- Extremely reliable and robust.
- Failure of one node doesn't affect the network.
- Data can be rerouted through alternate paths.
- High fault tolerance.

Disadvantages:

- Expensive to install and maintain.
- Complex configuration.
- Requires more cables and ports.

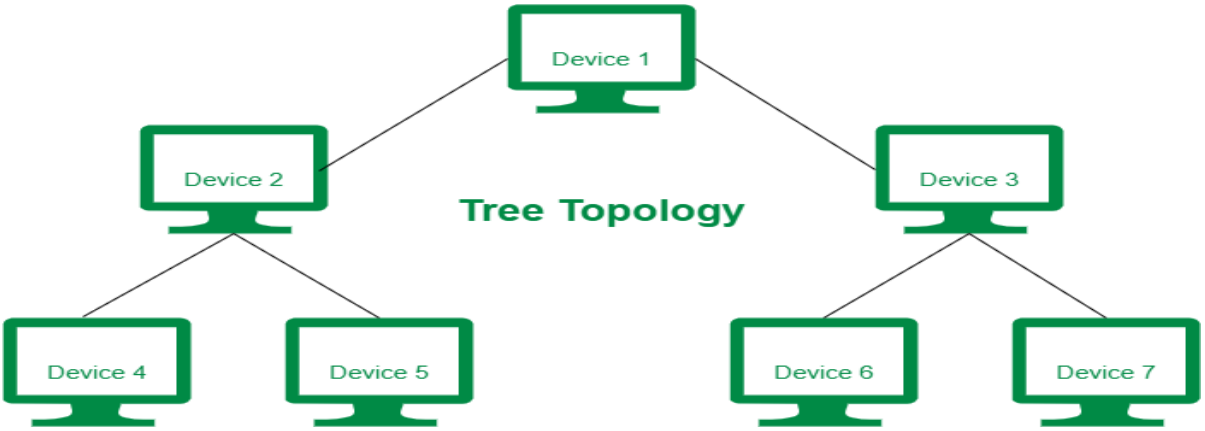
Use Case: WANs, military networks, critical systems.

Tree Topology

A Tree topology is a structure where devices are connected hierarchically. It resembles a tree with a root node and various branches. The root node is connected to multiple levels of child nodes, forming a hierarchy.

Description:

- A combination of star and bus topology.
- Nodes are connected in a hierarchical manner.



Advantages:

- Scalable and easy to manage.
- Fault detection is easy.
- Supports future network growth.

Disadvantages:

- Dependent on the root (main hub).
- More cabling required.
- Complex maintenance.

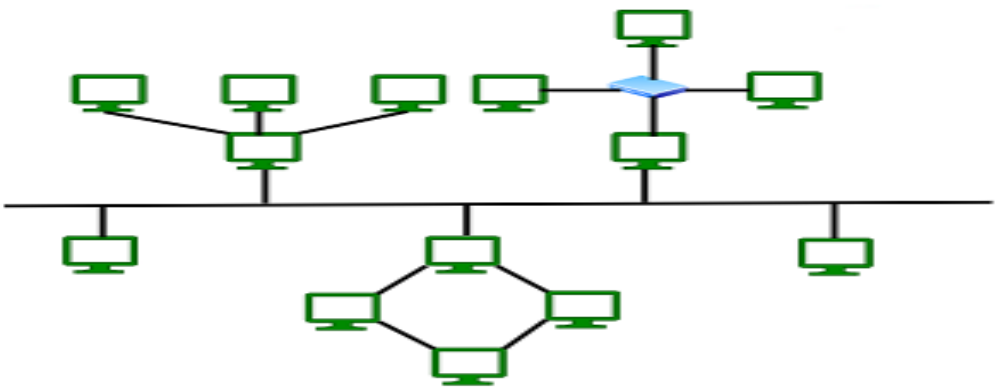
Use Case: Large enterprise networks, universities.

Hybrid Topology:

It is the mixture of two or more topologies. Therefore it is called Hybrid topology. A hybrid topology combines characteristics of linear bus and star and/or ring topologies.

Description:

- A mixture of two or more topologies (e.g., star-bus, star-ring).
- Designed to meet specific network requirements.



Advantages:

- Flexible and scalable.
- Can be customized.
- Good performance and reliability.

Disadvantages:

- Very complex in design.
- Expensive.
- Requires advanced network knowledge to maintain.

Use Case: Large corporations, data centers, ISPs.

IP ADDRESS (INTERNET PROTOCOL ADDRESS)

An IP Address (Internet Protocol Address) is a unique numerical label assigned to each device (computer, smartphone, printer, etc.) connected to a network that uses the Internet Protocol for communication.

It acts like a home address for your device on the internet — it identifies where data should be sent and received.

Example:

IPv4 Example: 192.168.1.1

IPv6 Example: 2001:0db8:85a3:0000:0000:8a2e:0370:7334

Purpose of IP Address:

- Identification: Each device on a network has a unique IP address that identifies it.
- Location Addressing: Helps to locate where a device is in the network.
- Communication: Enables devices to send and receive data packets over the internet.

Types of IP Addresses:

1. IPv4 (Internet Protocol Version 4)

- Uses 32-bit numeric address.
- Written as four numbers separated by dots.
- Each number ranges from 0 to 255.

Example: 192.168.10.5

Total possible addresses: ≈ 4.3 billion

Features:

- Simple and widely used
- Limited number of addresses

2. IPv6 (Internet Protocol Version 6)

- Uses 128-bit address format.
- Written as eight groups of hexadecimal numbers separated by colons.

Example: 2001:0db8:0000:85a3:0000:8a2e:0370:7334

Total possible addresses: ≈ 3.4×10^{38} (almost unlimited)

Features:

- Solves IPv4 shortage problem
- Provides better security and faster routing
- Categories of IP Addresses:

A) Private IP Address

- Used within local networks (like in homes, offices).
- Not accessible directly from the internet.

Example: 192.168.x.x, 10.x.x.x, 172.16.x.x

B) Public IP Address

- Used to identify a device on the internet.
- Provided by the Internet Service Provider (ISP).

Example: 8.8.8.8 (Google DNS)

DOMAIN NAME

A **Domain Name** is the **human-readable address** of a website that represents its **IP address** on the Internet. It is used to easily identify and access websites without remembering long numerical IP addresses.

Example: Instead of typing 142.250.190.14, we can simply type **www.google.com** — this is the **domain name**.

Every website on the internet has an **IP address**, but numbers are hard to remember. So, **Domain Names** were created to make it easier for people to find websites using words.

When you enter a domain name in a browser:

1. It is sent to the **Domain Name System (DNS)**.
2. The **DNS converts (maps)** the domain name into its **corresponding IP address**.
3. The browser then connects to that IP address to load the website.

Example Process:

You type: www.youtube.com

↓

DNS finds IP: 142.250.190.78

↓

Browser connects → YouTube website opens

Structure of a Domain name:

A domain name has three parts, separated by dots.

Example: www.example.com

Part	Name	Description	Example
1.	www	Subdomain(World Wide Web)	www
2.	example	Second-level domain(website name)	example
3.	.com	Top-Level Domain(TLD)	.com, .org, .edu

Types of Domains:

Type	Description	Examples
Top-Level Domain (TLD)	The last part of the domain name	.com, .org, .net, .edu
Country Code TLD(ccTLD)	Used for specific countries.	.in(India), .us(USA)
Second-level Domain (SLD)	The main name chosen by the website owner.	google, yahoo, amazon
Subdomain	A division of the main domain.	mail.google.com, blog.example.com

WEB BROWSER

A **Web Browser** is a **software application** used to **access, retrieve, and display** web pages from the **World Wide Web (WWW)**. It allows users to view websites, images, videos, and other online content by entering a **URL (Uniform Resource Locator)**.

Example: Google Chrome, Mozilla Firefox, Microsoft Edge, Safari, Opera

Explanation:

When you type a **website address (URL)** like www.wikipedia.org in a web browser:

1. The browser contacts the **web server** using the **Internet Protocol (IP)**.
2. It **downloads** the webpage's content (HTML, CSS, images, etc.).
3. It then **displays** the page in a readable format on your screen.

So, the browser acts as a **bridge between the user and the internet**.

Functions of a Web Browser:

Function	Description
Access Web Pages	Connects to web servers and loads web pages.
Display Content	Converts HTML, CSS, and JavaScript into a visual page.
Navigation	Provides buttons like Back, Forward, Refresh, and Home.
Download Files	Allows downloading of images, videos, or documents.
Manage Bookmarks	Saves favourite websites for quick access.
Privacy & Security	Uses HTTPS, private browsing, and security features.

Common Web Browsers:

Browser Name	Developer	Key Features
Google Chrome	Google	Fast, secure, supports extension.
Mozilla Firefox	Mozilla Foundation	Open-source, privacu-focused
Microsoft Edge	Microsoft	Built into Windows, fast performance
Safari	Apple	Default browser on Apple devices

Opera	Opera Software	Built-in VPN and ad blocker

Example Working:

User types: www.google.com
↓
Browser sends request to Google's server
↓
Server sends web page data
↓
Browser displays Google homepage

WWW (WORLD WIDE WEB)

The **World Wide Web (WWW)** is a **collection of interlinked web pages** that can be accessed over the Internet using a **web browser**. It allows users to view text, images, videos, and other multimedia through websites using **HTTP (HyperText Transfer Protocol)**.

Example: When you open www.wikipedia.org or www.google.com, you are using the **World Wide Web**.

Explanation:

The WWW is **not the Internet itself**, but a **service** that runs on the Internet. It was invented by **Sir Tim Berners-Lee** in **1989** to make information sharing easier.

It connects millions of web pages through **hyperlinks**, allowing users to navigate from one page to another with a click.

How WWW Works:

1. A user types a **URL (Uniform Resource Locator)** like www.example.com into a **web browser**.
2. The **browser contacts the web server** that hosts that website.
3. The **server sends back** the web page files (HTML, images, etc.).
4. The **browser displays** the web page to the user.

Features of WWW:

- **Hyperlinked information system** (connected pages)
- **Multimedia support** (text, images, audio, video)

- **Global access** — available 24×7 worldwide
- **Easy navigation** through links
- **Platform independent** (can be used on any device or OS)

Advantages of WWW:

- Easy access to vast information
- Helps in communication and education
- Supports e-commerce and online services
- Provides entertainment and global connectivity

Disadvantages:

- Contains misleading or false information
- Privacy and security issues
- Internet addiction or misuse

EMAIL (ELECTRONIC MAIL)

Email (Electronic Mail) is a **method of sending and receiving digital messages** over the Internet. It allows people to communicate instantly by sending **text, images, documents, audio, or video files** electronically.

Example: example@gmail.com

Explanation:

Email works just like traditional mail, but it's **faster and digital**. Instead of sending a paper letter, you type a message on a computer or phone and send it through the internet to another person's **email address**.

How Email Works:

1. **Composing:** The user writes a message and attaches files (optional).
2. **Sending:** The message is sent from the sender's email server using **SMTP (Simple Mail Transfer Protocol)**.
3. **Receiving:** The receiver's email server stores the message using **POP3 (Post Office Protocol)** or **IMAP (Internet Message Access Protocol)**.
4. **Reading:** The receiver opens the message using an **email client** or **webmail**.

Example Process:

Sender → Mail Server → Internet → Receiver's Mail Server → Receiver

Components of an Email:

Component	Description
To:	Address of the main recipient
Cc:	(Carbon Copy) Sends a copy to others
Bcc:	(Blind Carbon Copy) Sends a hidden copy
Subject:	Title or topic of the email
Body:	Main message content
Attachments:	Files (images, PDFs, docs) sent with email
Signature:	Sender's name and contact details

Advantages of Email:

- Fast and reliable communication
- Low cost (almost free)
- Can send to multiple people at once
- Allows attachments like images, documents, etc.
- Environment-friendly (paperless)

Disadvantages of Email:

- Requires internet access
- Spam or junk emails may appear