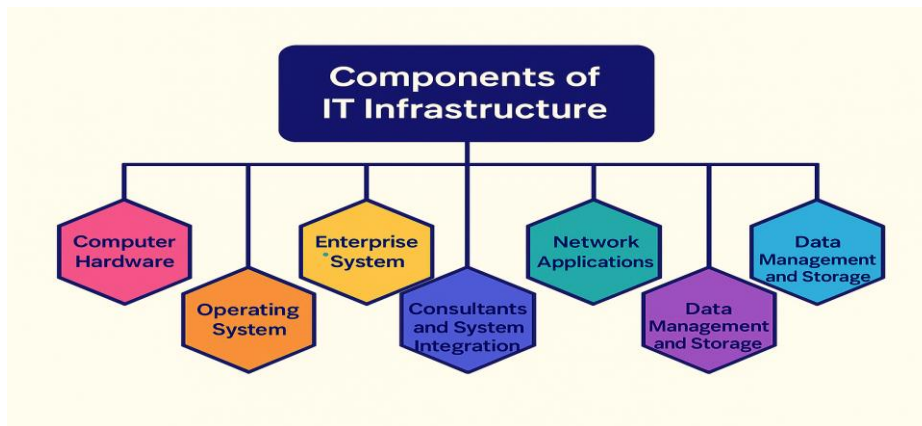


**TITLE: INFRASTRUCTURE**

- **Infrastructure** -The basic physical and organizational structures and facilities (e.g. buildings, roads, power supplies) needed for the operation of a society or enterprise.



- **IT Infrastructure** – IT infrastructure refers to the fundamental hardware, software, network components, and other resources necessary to operate and manage information technology within an organization. Have your own infrastructure, you essentially need to create and manage your own computing resources, networks, and software. This can involve purchasing hardware, setting up a network, installing software, and configuring security measures.
- **Infrastructure investments** -This is like investing in the basic things a country or area needs to work properly. Think of it as building and fixing the essential systems that everyone uses, such as: Roads, power plants etc.
- **Cloud infrastructure** is the underlying hardware and software that enables cloud computing services, including servers, storage, and networking. It allows users to access computing, resources over the internet without owning or managing physical infrastructure themselves. Cost effectiveness in cloud infrastructure means that for businesses and organizations, it's a way to have the IT power they need without the traditional high costs of buying and maintaining their own infrastructure, allowing them to be more agile and financially efficient.
- **Components of IT Infrastructure**



➤ **Computer Hardware**

The physical machines and devices that power IT systems.

Examples: Servers, laptops, desktops, storage devices, routers.

➤ **Operating System**

Software that controls hardware and provides services to applications.

Examples: Windows, Linux, macOS, Unix.

➤ **Enterprise System Application**

Large software solutions that manage key business processes across the organization. Examples: ERP (SAP), CRM (Salesforce), HRMS (Workday).

➤ **Network Applications**

Software that allows communication and sharing over networks.

Examples: Email systems, video conferencing tools, VPNs.

➤ **Consultants and System Integration**

Experts and service providers who help set up, customize, and connect various IT systems smoothly.

Examples: Infosys, Accenture (consulting companies), system integrators.

➤ **Data Management and Storage**

Systems that store, organize, protect, and retrieve data safely.

Examples: Databases (MySQL, Oracle), storage servers (NAS, SAN).

➤ **Internet Platforms**

Platforms and services that connect businesses to the web.

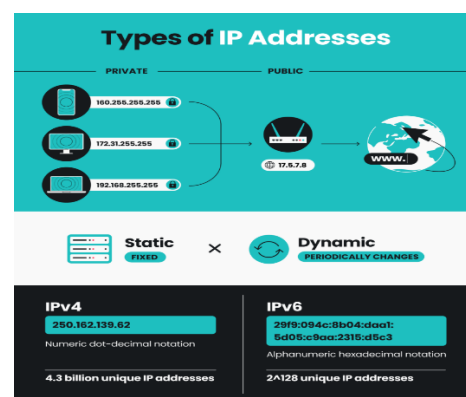
Examples: Web hosting, cloud services (AWS, Azure), domain management.

- **What is networking?**

Generally, means building and maintaining connections between people, devices or systems depending on context. In technology, Computer networking is the process of connecting two or more computing devices to enable the transmission and exchange of information and resources.

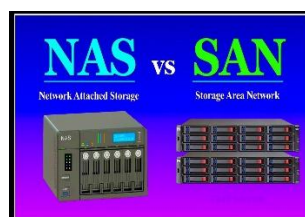
- **What is an IP Address?**

**IP Address** stands for **Internet Protocol Address**. It is a **unique number** assigned to every device connected to a network (like the internet or a private network). It starts from 0-255.



- **Difference between NAS and SAN?**

NAS (Network Attached Storage) is a simpler, more cost-effective option for sharing files across a network, while SAN (Storage Area Network) is a higher-performance, dedicated network for block-level storage, primarily used in enterprise environments.



- **Business Intelligence (BI)** tools are software applications that help organizations collect, analyse, and visualize data to make better decisions. They are essential for transforming raw data into actionable insights, enabling real-time visibility into performance, and facilitating rapid responses to changes. Eg: Tableau, PowerBI etc
- **OLAP, or Online Analytical Processing**, is a technology used for performing high-speed, complex queries on large datasets. It's often used in business intelligence (BI) and decision support to analyse data from multiple perspectives.

### The OLAP process

How data is prepared for online analytical processing (OLAP)



- **Types of Networks**

## Types of Computer Networks



- **Transmission Media** - Transmission media is the physical medium through which data is transmitted from one device to another within a network. These media can be wired or wireless.

There are two main types:

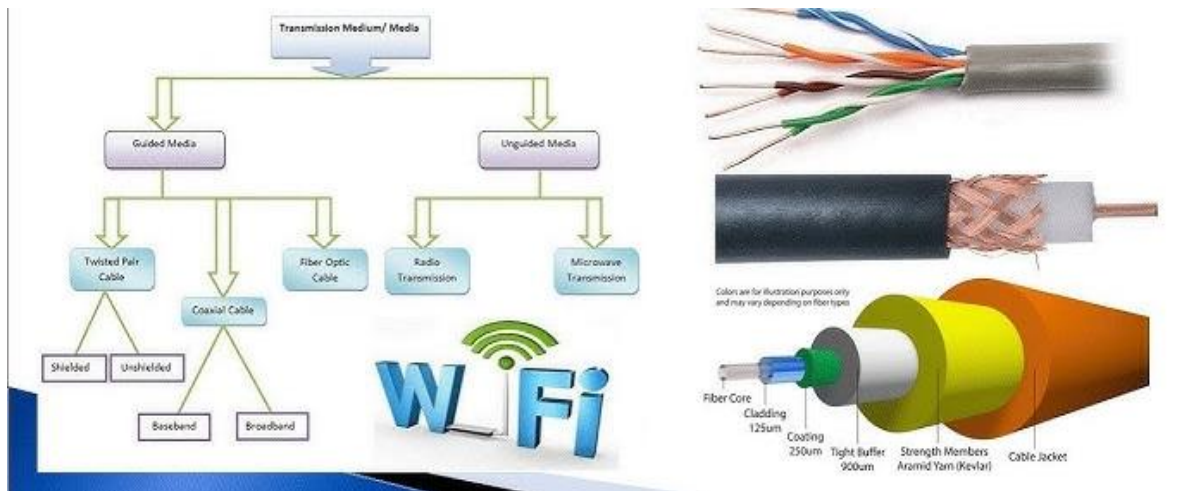
1)Wired (guided) media — uses cables to send data, like:

- Twisted pair cables (used in Ethernet)
- Coaxial cables (used for cable TV)
- Fiber-optic cables (uses light to send data very fast).

2)Wireless (unguided) media — sends data through the air, like:

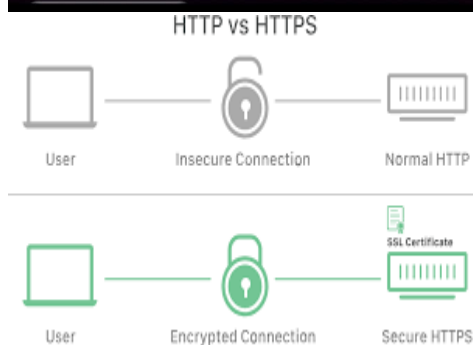
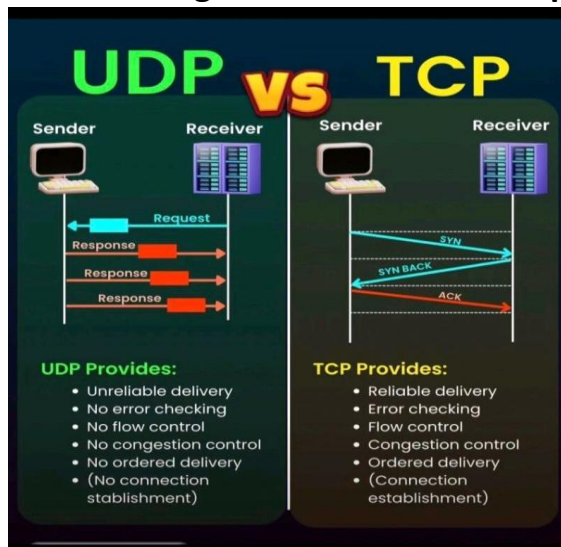
- Wi-Fi

- Bluetooth
- Cellular networks (4G, 5G)
- Satellite communication.



- **Internet** -The Internet is a global network of interconnected computers and devices that allows users to share information and communicate. It consists of a vast collection of private, public, academic, business, and government networks. The Internet facilitates various services, including the World Wide Web, email, and online communication.
- **Wireless revolution**- The "wireless revolution" refers to the shift from wired to wireless communication and networking, significantly transforming how we connect and communicate. This revolution, starting in the 1990s, is driven by advancements in radio frequency (RF) technology and digital wireless networks, enabling technologies like cell phones, wireless Internet, and more. It has led to a paradigm shift in how we use technology, impacting everything from consumer electronics to industrial systems.
- **Cloud computing** is the practice of delivering computing resources like servers, storage, and applications over the internet, rather than having them physically on a user's own computer or within their own on-premise data center. This allows users to access these resources on demand and pay only for what they use, eliminating the need to manage their own infrastructure. Eg: Google Drive to store documents
  - **What is data centre?**

A data centre is a physical facility designed to house computer systems and associated components, like telecommunications and storage, for the purpose of collecting, processing, and storing data. **EG:** Cloud computing



- The **OSI** (Open Systems Interconnection) Model is a set of rules that explains how different computer systems communicate over a network.

7	Application Layer	Human-computer interaction layer, where applications can access the network services
6	Presentation Layer	Ensures that data is in a usable format and is where data encryption occurs
5	Session Layer	Maintains connections and is responsible for controlling ports and sessions
4	Transport Layer	Transmits data using transmission protocols including TCP and UDP
3	Network Layer	Decides which physical path the data will take
2	Data Link Layer	Defines the format of data on the network
1	Physical Layer	Transmits raw bit stream over the physical medium

- **Network Topology** - Network topology refers to the arrangement of devices and connections within a network, impacting how data flows, network performance, and scalability.

