Class 3

Understanding Internet, Networks, Web and more

## What is Network?

Many resources, many devices, machines and systems are interconnected. We will call this whole system Network.

Types of Networks

1 – Local Area Network (LAN)

- A LAN is a network that connects devices within a limited area, such as a home, office, or school, allowing resource sharing like files and printers.
- If the same network system will be inside a single room or a single building, it will be called a LAN network.
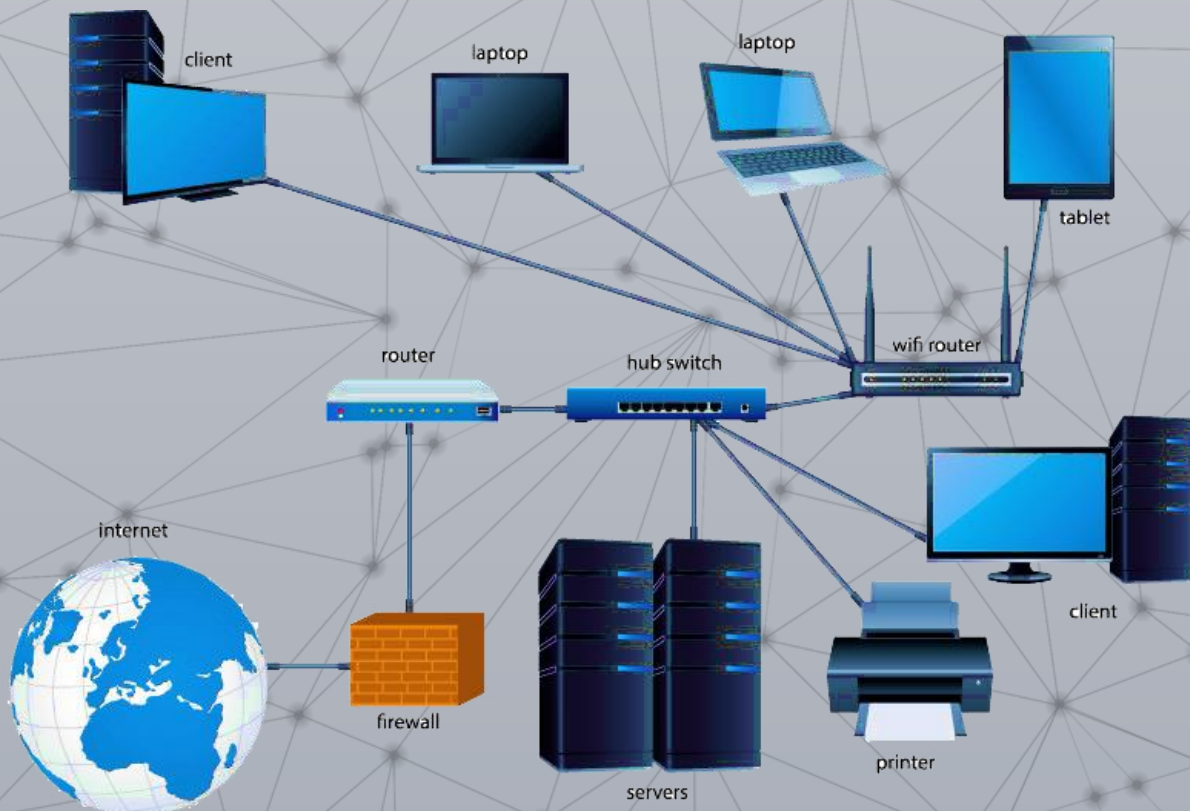
2 – Metropolitan Area Network (MAN)

- **A MAN (Metropolitan Area Network)** is a network that spans a city or a large campus, connecting multiple LANs within a metropolitan area. It is larger than a LAN but smaller than a WAN, often used by businesses, governments, or universities for efficient data transfer.
- When there is communication, resource sharing, message passing at the level of cities, towns and states, it comes in the domain of MAN.
  - Business: Connecting office branches within a city.
  - Education: Linking university campuses in a metro area.
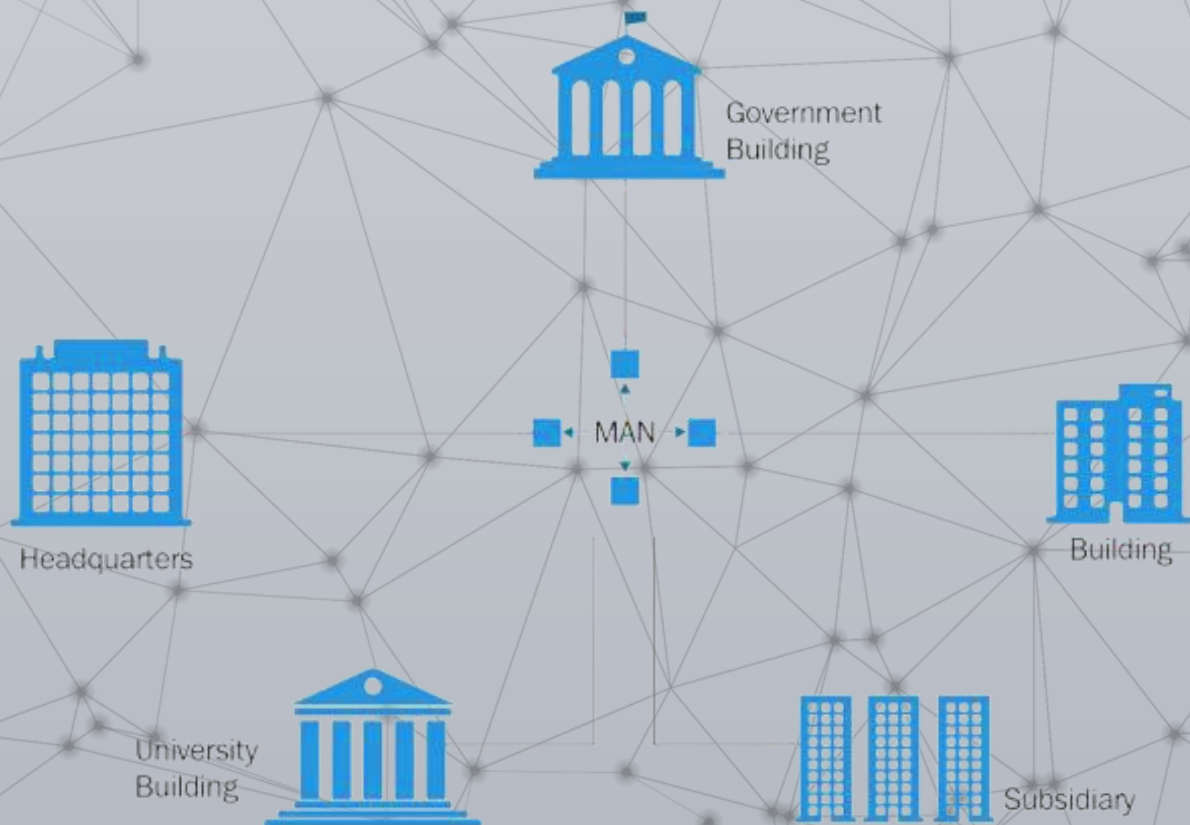
3 – Wide Area Network (WAN)

- **A WAN (Wide Area Network)** connects computers and devices across large geographical areas, such as cities, countries, or continents.
- Its domain includes internet services, enterprise networks, and communication systems that require long-distance data exchange.
- Example of company's private network that links its offices across different cities or countries.
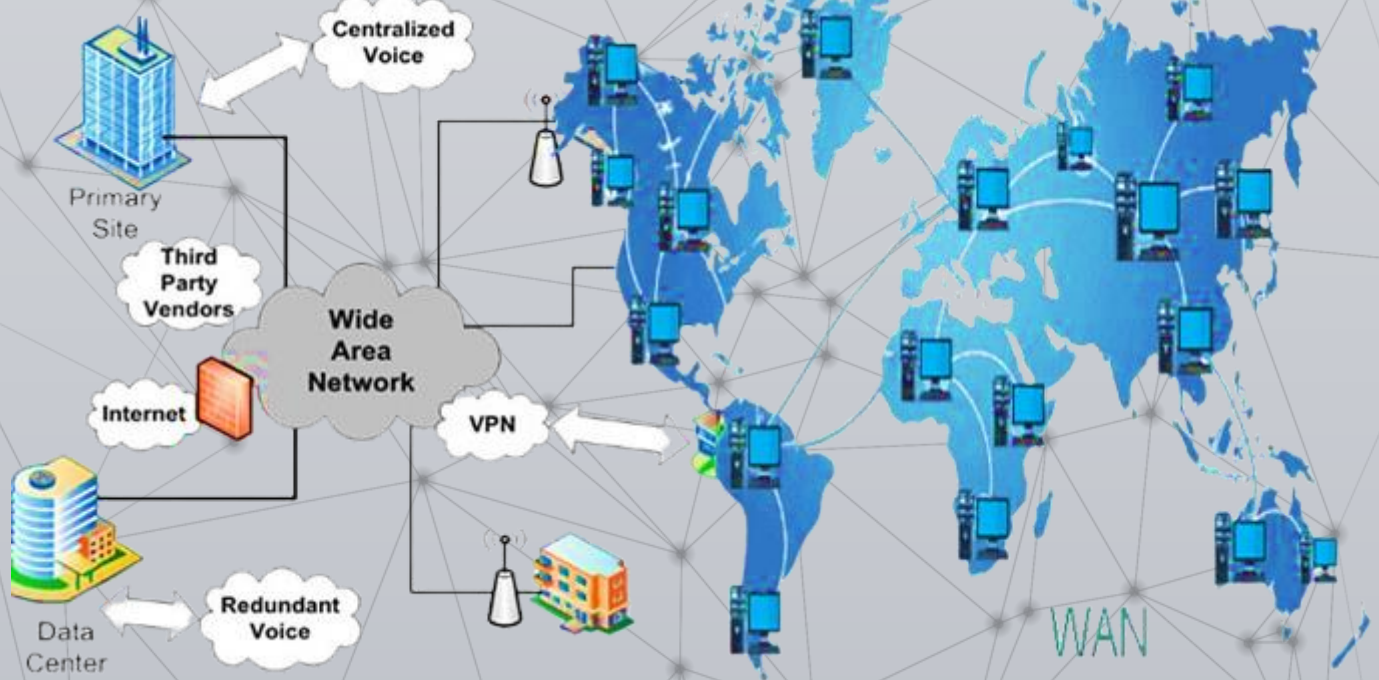
What is Internet?

- The **Internet** is a global network connecting millions of private, public, academic, business, and government networks, enabling communication and data sharing worldwide.
- It is the global network of networks (LAN, MAN and WAN).

What is world wide web (web)?

- The **World Wide Web (WWW)** is a system of interconnected documents and resources, accessed via the internet using web browsers. It allows users to view and interact with web pages through hyperlinks.
- In this case, Internet is a parent entity and www/web is a sub entity or subset.

What is IP address?

- An IP Address (Internet Protocol Address) is a unique numerical label assigned to devices connected to a network, enabling them to identify and communicate with each other over the internet.
- If we want to send some data from one device to another device on the Internet, then we need to know the IP address of that device.

192.168.0.1

172.16.254.1

84.17.59.34

84.17.59.34

172.16.254.1
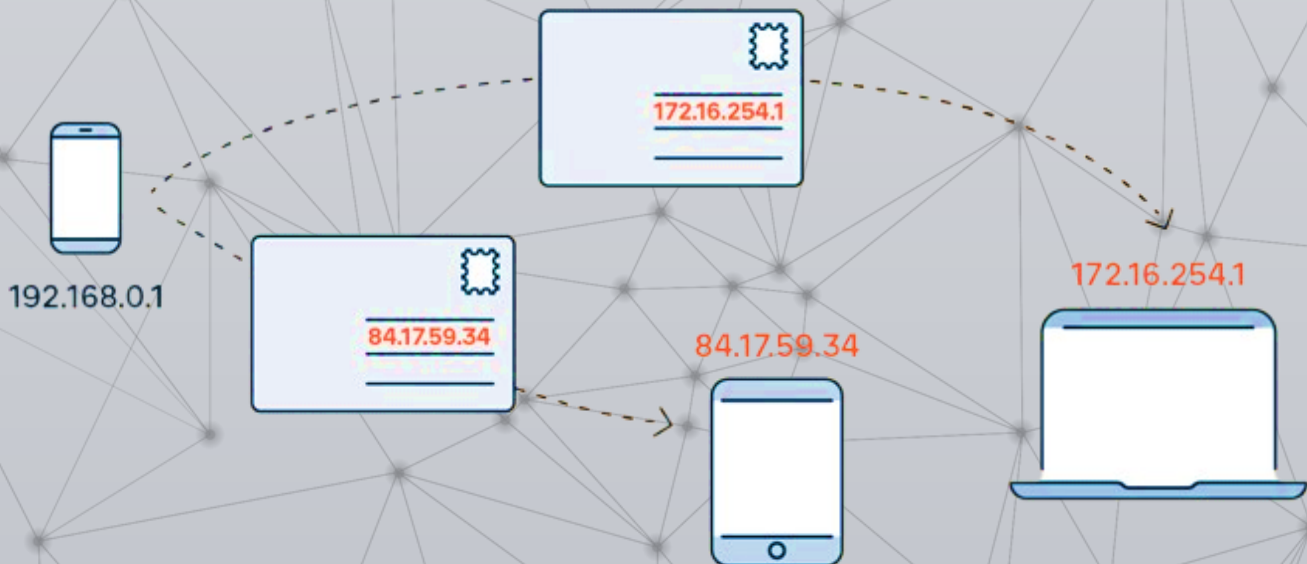
What is browser?

- We can access all the resources, documents, websites and web apps on the network by using the internet using browser.

Common Browsers:

1. Google Chrome
2. Mozilla Firefox
3. Microsoft Edge
4. Safari
5. Opera
6. Brave
7. Vivaldi

What is browser engine?

- We need browser engines to run web-related things like render and run web applications.
- Think of a browser engine as the heart of your web browser. It is the essential software that acts as a bridge between the web page's code (HTML, CSS, JavaScript) and the visual experience you see on your screen

Browsers and Their Respective Browser Engines

1. Google Chrome - Blink
2. Mozilla Firefox - Gecko
3. Microsoft Edge - Blink (formerly EdgeHTML)
4. Safari - WebKit
5. Opera - Blink (formerly Presto)

6. Brave - Blink
7. Vivaldi - Blink
8. Internet Explorer - Trident
9. Tor Browser - Gecko (based on Firefox)

These browser engines are responsible for rendering web content and executing JavaScript to display pages correctly.

Client-Server Model

The **client-server model** is a computing architecture where a client (user device) sends requests, and a server (central system) processes them and returns the requested data or service. It's commonly used in web applications, where browsers (clients) interact with web servers to access websites.
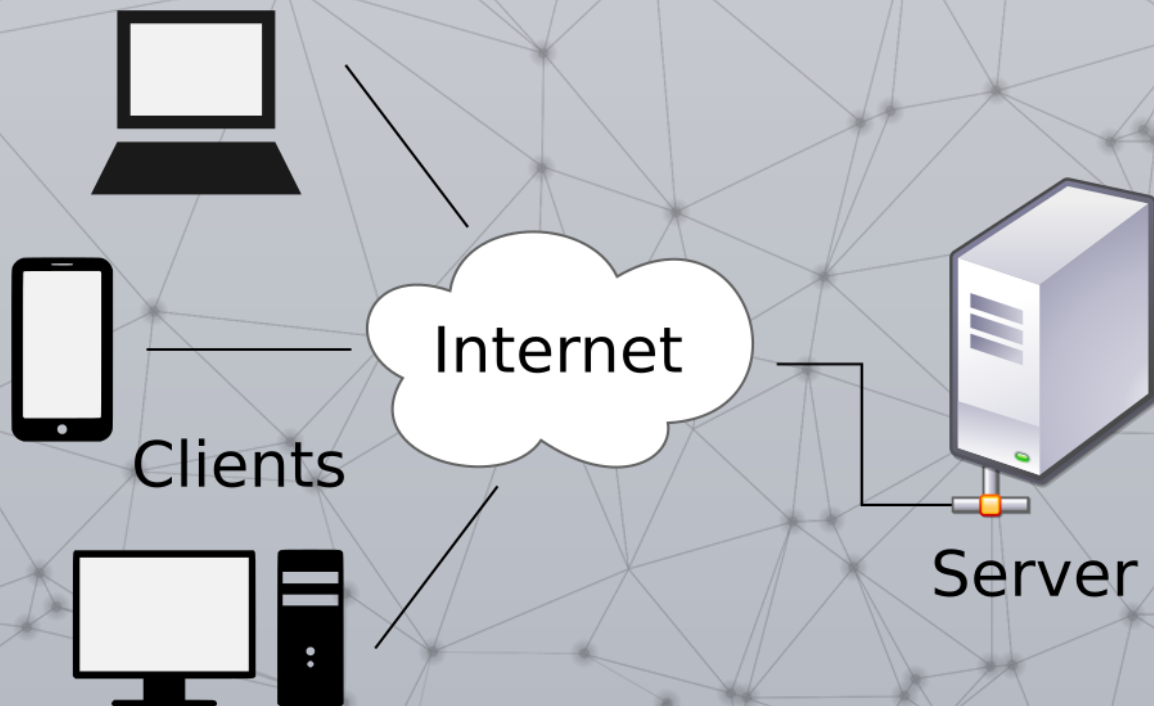
Types of Clients	Types of Servers
Devices: (Mobiles, Laptops, PC)	**Web Servers:** Serve web content (e.g., Apache, Nginx).
Web Browsers: Access web pages (e.g., Chrome, Firefox).	**Database Servers:** Store and manage data (e.g., MySQL, MongoDB).
Mobile Apps: Connect to servers for data (e.g., WhatsApp, Spotify).	**File Servers:** Provide file storage and access (e.g., Windows File Server).
Desktop Applications: Interact with servers (e.g., Slack, Skype).	**Application Servers:** Run specific applications (e.g., Tomcat, JBoss).
Email Clients: Send and receive emails (e.g., Outlook, Thunderbird).	**Mail Servers:** Handle email delivery (e.g., Microsoft Exchange).

How www.facebook.com works?

Client Request:

- A user enters "www.facebook.com" in a browser (the client).
- The browser sends a DNS request to resolve the domain name (www.facebook.com) to its IP address.
- Once resolved, the browser sends an HTTP/HTTPS request to Facebook's web server.

Server Processing:

- Facebook's web server receives the request.
- It processes the request, retrieves necessary data (e.g., user profile, feed) from the database server or application server, and generates a response.

Client Response:

- The web server sends back the response (e.g., HTML, CSS, JavaScript, and data).
- The browser renders the received content, displaying Facebook's homepage or dashboard to the user.
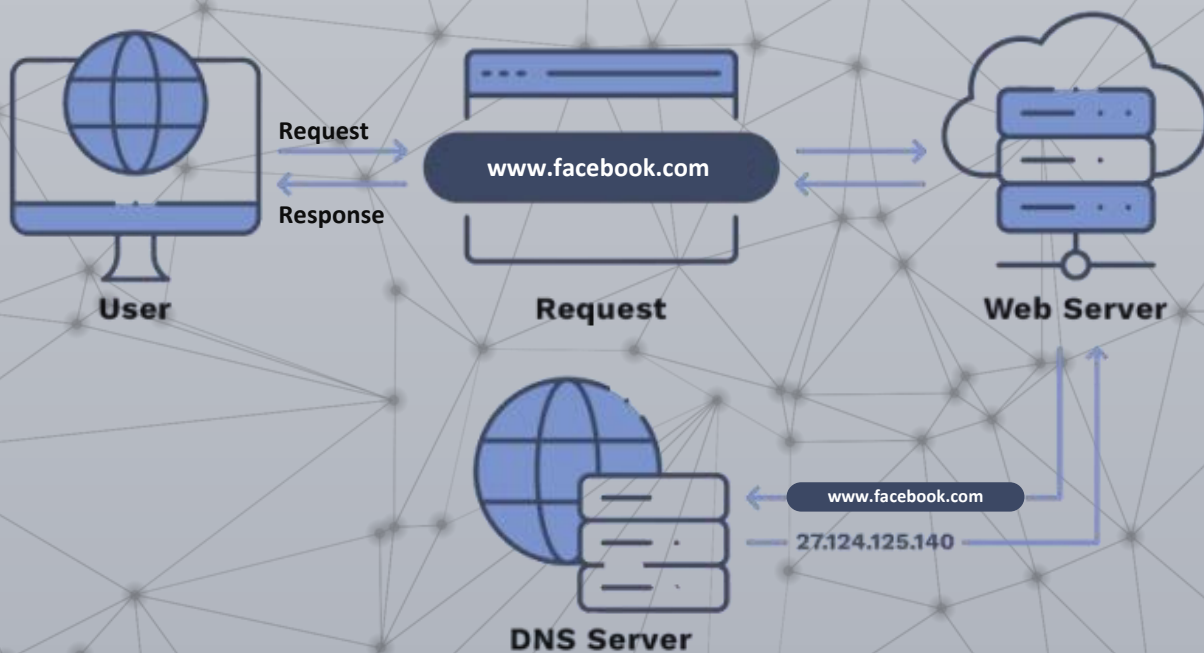
What is DNS?

A **Domain Name System** is a system that holds records of IP addresses and domain names. It allows browsers to find the correct IP address corresponding to the entered hostname URL.

Purpose of DNS Servers

The **DNS Server** sits between humans and computers. Its main purpose is to translate what a user types in their web browser into something that a computer can understand to locate the requested website.

In simple terms, the purpose of a DNS Server is to convert a domain name, like 'www.facebook.com' into an IP address, like 172.101.3.115.