

Live Cohort

Day -1

How the Internet Works



1. History of the Web

◆ Web 1.0 (1990s – early 2000s)

In the early stage of the internet, websites were **static**. They only contained fixed information, and users could **only read** the content without interacting.

◆ Example

Early news websites or company information pages.

◆ Web 2.0 (2004 onwards)

This era introduced **user-generated content** and social interaction. People could not only consume but also **create, share, and connect** with others online.

- Rise of platforms like Facebook, YouTube, Wikipedia, and Blogs.
- Main focus: **Community building, sharing, and collaboration.**

◆ Web 3.0 (Now & Future)

The modern and future web is built on **blockchain technology** and **decentralization**. Data is no longer stored in a single company's server but distributed across many computers.

- Users own their data and can also earn via **tokens, NFTs, and smart contracts.**
- Examples: Cryptocurrencies, decentralized apps (dApps), and Metaverse projects.

2. How Computers Communicate

Every computer that connects to the internet has an **IP Address**, which acts like its phone number. To communicate, computers follow specific rules known as **protocols**.

- **TCP/IP protocol** is the foundation of the internet.
- Data is broken into small chunks called **packets**.
- Packets travel via **cables**, **WiFi**, or **satellites**.
- When they reach the destination, they are **reassembled** like pieces of a puzzle.

3. How Data Travels Across the World

The journey of data involves several key components:

- **Routers**: Work like traffic police, deciding the route of data packets.
- **Switches**: Connect devices inside a local network (e.g., your home WiFi).
- **Undersea cables**: Huge fiber optic cables that connect different countries and continents.

◆ Example

A WhatsApp message sent from India to the USA moves through **fiber optic undersea cables**. If one route fails, the internet automatically finds an **alternate path**.

4. Domain Name, IP & MAC Address, Routing

◆ Domain Name

A human-friendly way to access websites (e.g., google.com, amazon.in) instead of remembering numbers.

◆ IP Address (Internet Protocol)

The numeric identity of a device or server (e.g., 142.250.77.206).

- Works like a **phone number** of your device on the internet.

◆ MAC Address (Media Access Control)

A unique hardware ID given to every network card of a device.

- Works like an **Aadhaar card** for your device — permanent and unique.

◆ Routing

Routers analyze the network and decide the **fastest and safest path** for data packets to travel across the internet.

5. ISP & DNS Working Together

◆ ISP (Internet Service Provider)

Companies like Jio, Airtel, or BSNL that provide you with internet access. They connect your device to the global internet.

◆ **DNS (Domain Name System)**

DNS works like the **phonebook of the internet**. It translates **domain names** into **IP addresses** so that computers can understand them.

◆ **Process Example:**

1. You type google.com in the browser.
2. DNS translates it into its IP → 142.250.77.206.
3. Your ISP uses this IP to connect you to Google's server.

👉 Without DNS, we would have to remember long IP numbers for every single website.

