→ Domain Name System (DNS) —

DNS is like the internet's phonebook. It helps translate domain names (like www.google.com) into IP addresses (like 93.184.216.84) so computers can find each other.

Without DNS, we'd have to remember IP addresses for every website. Instead, DNS let us use easy-to-remember names.

- Domain Name Vs IP address —

1. Domain Name — A human friendly address like www.example.com
2. IP Address — A numeric label like 93.142.216.34

DNS bridges gap btw them so you can just type a name and DNS finds the right IP address behind it.

DNS Hierarchy —

DNS is structured like a tree, with multiple layers starting from the root.

Layers in DNS —

1. Root Server —
   - The top of the DNS server.
   - Directs queries to the correct Top-Level Domain (TLD) servers.
2. Top-Level Domains (TLDs) —
   - Examples — .com, .org, .net or country codes like .in, .uk

3. Second-Level Domain —

08.00 • The main part like example in example.com

4. Subdomains or Hostnames —

09.00 • Used to organize or point to specific services.

• Example — www in www.example.com

10.00 accounts in accounts.google.com

* Each level helps narrow down the path to the exact

11.00 IP address of the requested website.

12 → DNS Resolution (Domain Translation) —

When you type a website like www.example.com into

13.00 your browser, your computer needs to find its IP address. This process is called DNS resolution and

14.00 works as follows —

Steps —

15.00 1. You type www.example.com into the browser.

2. Your computer checks its local DNS cache to see

16.00 if it already knows the IP.

22 Sunday

3. If not found, it asks a recursive DNS server

17.00 (usually from your ISP or service like Google DNS).

4. The recursive server asks a root server, which points

18.00 to the correct TLD server (like for .com)

5. The TLD server sends the request to the authoritative

Notes name server for example.com.

6. The authoritative server responds with the IP address for www.example.com.

7. The recursive DNS server gives the IP back to your computer which then connects to the website.