

NETWROKING

- **Network** – Computer Connected Together
- **Internet** – Collection of this Computer Networks
- **Protocol** – Set of Rules for Communication, Example – TCP, FTP, UDP, HTTP, IP
- **Internet Society** – These are Responsible for Creating this Rules.
- **TCP (Transmission Control Protocol)** – Ensure that 100% data will reach its destination, without Corrupted on the way **Example** – Email, Web Browsing
- **UDP (User Datagram Protocol)** – Don't know that 100% data will reach its destination or not, **Example** – Video Games and Video Conferencing
- **HTTP (Hyper Text Transfer Protocol)** – Protocols used to access Web Pages (PORT – 80/443)
- **Modem** – Converts Digital to Analog Signals vice versa, Connect your home to Internet
- **Router** – Sends data Packets between your home network and the internet
- **DHCP (Dynamic Host Configuration Protocol)** – Assign IP Address Automatically to Devices.
- **PORT** - IP Address Tells us which Device we are working with while PORT Connects you to Specific Device
- **LAN (Local Area Network)** – Small Area Networks (Office, Home)
- **MAN (Metropolitan Area Network)** – City-Wide
- **WAN (Wide Area Network)** – Country or Globe-Wide (like Internet)

A lot of Local Area Network that are Connected to each other using Metropolitan Area Network and that are connected to each other using Wide Area Network is a internet

- **BUS Topology** – All Device Share a single Communication line like a bus route
- **STAR Topology** – All Device Connected to a Central HUB like Spokes on Wheel
- **STAR Topology** – Device Form a Closed Loop where data travels in a Circle
- **MESH Topology** – Every Device Connect to every other Devices like a Spider Web
- **TREE Topology** – A Hybrid of STAR and BUS, like branches of a tree from a main trunk
- **SMTP (Simple Mail Transfer Protocol)** – Sends Mail

- **POP3 (Post Office Protocol)** – Downloads email and delete from Server
- **IMAP (Internet Message Access Protocol)** – Allows to View emails on multiple Devices
- **DNS (Domain Name System)** – Converts Domain Names (google.com) into IPs (Like a Phonebook)
- **IPv4** – 32-bit, Limited Address
- **IPv6** – 128-bit, Massive Address Space
- **NAT (Network Address Translator)** – Converts Private IPs to Public IPs for Internet Access
- **OSI MODEL -**

Layer	Name	Pizza Example
7	Application	You (user) place the pizza order using the app (e.g., WhatsApp, browser).
6	Presentation	The app formats your order, translates your language, or encrypts it (e.g., "Large Pizza" → code).
5	Session	Keeps the connection open while you're chatting or ordering (session = live conversation).
4	Transport	The kitchen splits the order into items, adds delivery instructions (uses TCP/UDP).
3	Network	Decides the best route to deliver your order (IP address, routing, ping , traceroute).
2	Data Link	Gives the delivery guy the exact apartment number (MAC address, switching).
1	Physical	The road, bike, or cables used to physically deliver your pizza (Wi-Fi, cable, fiber, signals).

- **OSI FOR DEVOPS -**

Layer	What It Handles	Example in DevOps
7. Application	What the user interacts with	curl, browser, Postman
6. Presentation	Formats & encrypts data	SSL/TLS, base64
5. Session	Maintains connections	SSH, API sessions
4. Transport	Reliable delivery	TCP (with acknowledgment), UDP
3. Network	Routing & IP	ping, traceroute, IP address
2. Data Link	MAC & Switch	MAC address, ARP
1. Physical	Wires & signals	Ethernet, Wi-Fi, cables

- **OSI Model (7 Layers)**

"All People Seem To Need Data Processing"

- **Application** (What users see)
- **Presentation** (Formats data)
- **Session** (Keeps track of connection)

- **Transport** (Breaks data into packets)
- **Network** (Finds best path)
- **Data Link** (Delivers to next device)
- **Physical** (Wires, cables)

❖ **Real-Life Analogy:**

Imagine ordering pizza:

1. **Application** – You place the order.
2. **Presentation** – Pizza menu is translated to your language.
3. **Session** – Your call/session stays active while ordering.
4. **Transport** – Chef divides order into pizza boxes.
5. **Network** – Delivery guy chooses the best route.
6. **Data Link** – Delivers from restaurant to your door.
7. **Physical** – The bike, road, or even phone lines used