

What is OSI Model?

OSI (Open Systems Interconnection) Model is a **7-layer reference model** that explains **how data is sent from one computer to another over a network**.

👉 Think of it as **steps followed when you send data on the network**.
Each layer has a **specific responsibility**.

- 📌 **Full Form:** Open Systems Interconnection
- 📌 **Created by:** ISO (International Organization for Standardization)

Why OSI Model is Important?

- Helps us **understand networking step by step**
- Makes **troubleshooting easier**
- Used in **interviews, certifications & real networking jobs**
- Provides a **standard way** to design network products

OSI 7 Layers (Top to Bottom)

7. Application
6. Presentation
5. Session
4. Transport
3. Network
2. Data Link
1. Physical

💡 **Easy Trick to Remember:**

All People Seem To Need Data Processing

1 Physical Layer (Layer 1)

What it does:

- Transfers **raw bits (0s and 1s)** on the wire
- Deals with **hardware and signals**

Examples:

- Cables (LAN cable, fiber)
- Voltage, signals
- Hubs

Real-Life Example:

- 👉 Road itself on which vehicles travel
- 📌 If cable is cut → Physical layer issue

2 Data Link Layer (Layer 2)

What it does:

- Uses **MAC Address**
- Error detection
- Data framing

Examples:

- Switch
- Ethernet
- MAC Address

Real-Life Example:

- 👉 House address inside a city
- 📌 If switch issue or MAC problem → Layer 2

3 Network Layer (Layer 3)

What it does:

- Uses **IP Address**
- Finds **best path** for data
- Routing

Examples:

- Router
- IP Address
- ICMP

Real-Life Example:

- 👉 City & route selection using Google Maps

📌 If IP not reachable → Layer 3 issue

4 Transport Layer (Layer 4)

What it does:

- Controls **data delivery**
- Ensures **reliable or fast communication**
- Uses **Port Numbers**

Protocols:

- **TCP** – Reliable (email, file download)
- **UDP** – Fast (video, gaming)

Real-Life Example:

👉 **Courier service**

- TCP = Registered courier
- UDP = Normal speed courier

📌 **Port number example:**

- HTTP – 80
- HTTPS – 443

5 Session Layer (Layer 5)

What it does:

- Creates, maintains and ends **sessions**
- Manages login sessions

Examples:

- User login
- Video call session

Real-Life Example:

👉 **Phone call start, hold, end**

📌 **Session timeout issue → Layer 5**

6 Presentation Layer (Layer 6)

What it does:

- **Data format conversion**

- **Encryption & decryption**

- Compression

Examples:

- SSL / TLS

- JPEG, MP3, MP4

Real-Life Example:

👉 **Language translator**

(English ↔ Hindi)

📌 HTTPS encryption → Layer 6

7 Application Layer (Layer 7)

What it does:

- Directly interacts with **user**
- Provides network services

Examples:

- Browser (Chrome)
- Email (SMTP)
- FTP
- HTTP/HTTPS

Real-Life Example:

👉 **You typing message in WhatsApp**

📌 Website not opening → Layer 7

One Complete Example (Sending Email)

Step	OSI Layer	What Happens
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You write email	Application	Gmail
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Encrypt data	Presentation	SSL
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Session created	Session	Login session
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Data divided	Transport	TCP
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IP routing	Network	Router
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MAC delivery	Data Link	Switch
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Bits sent	Physical	Cable
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OSI Model vs Real Life (Short)

OSI Layer Real Life

Application	Using app
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Presentation	Language & security
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Session	Conversation
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Transport	Delivery service
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Network	Route selection
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Data Link	House address
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Physical	Road & wires
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