

# **OSI Model**

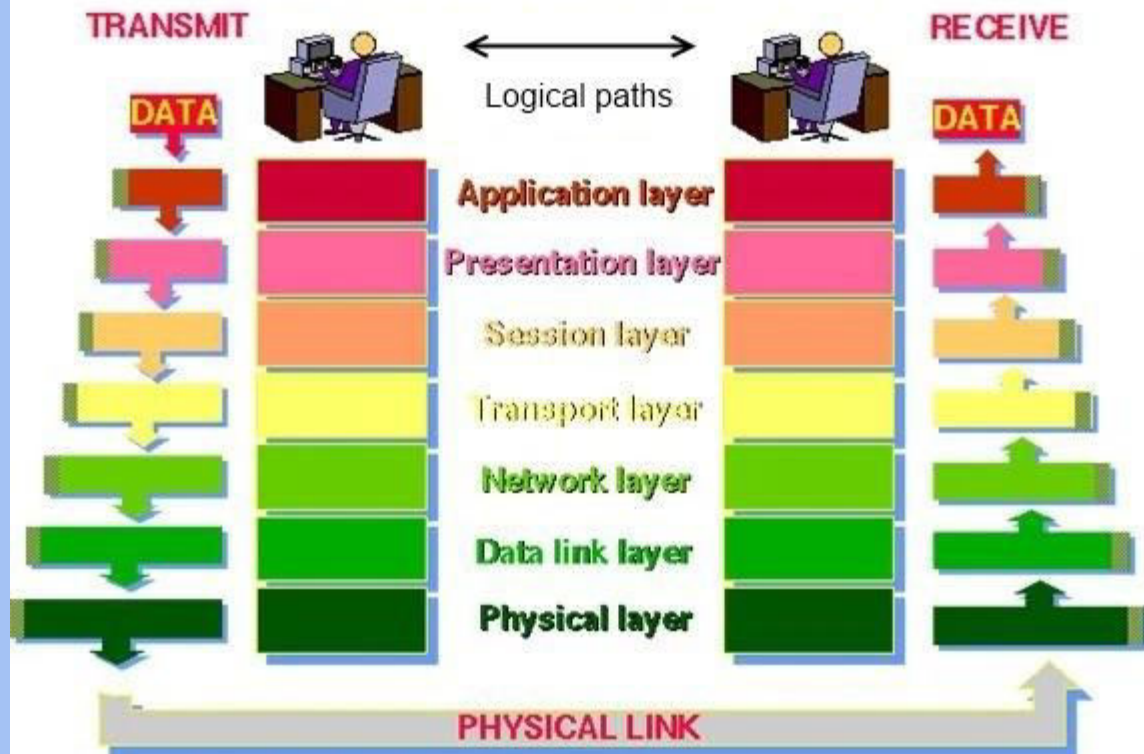
**Elementrix Classes**

# OSI Model

- ❑ OSI stands for Open System Interconnection is a reference model that describes how information from a software application in one computer moves through a physical medium to the software application in another computer.
- ❑ OSI consists of seven layers, and each layer performs a particular network function.
- ❑ OSI model was developed by the International Organization for Standardization (ISO) in 1984, and it is now considered as an architectural model for the inter-computer communications.

- ❑ OSI model divides the whole task into seven smaller and manageable tasks. Each layer is assigned a particular task.
- ❑ Each layer is self-contained, so that task assigned to each layer can be performed independently.

# THE 7 LAYERS OF OSI



## OSI model

Layer	Name	Example protocols
7	Application Layer	HTTP, FTP, DNS, SNMP, Telnet
6	Presentation Layer	SSL, TLS
5	Session Layer	NetBIOS, PPTP
4	Transport Layer	TCP, UDP
3	Network Layer	IP, ARP, ICMP, IPSec
2	Data Link Layer	PPP, ATM, Ethernet
1	Physical Layer	Ethernet, USB, Bluetooth, IEEE802.11

# 1. Physical Layer

- ❑ **Function:** The physical layer deals with the actual transmission of data over the network medium.
- ❑ **Practical Example:** In the context of sending an email, the physical layer involves the electrical signals that carry the email data over the physical network infrastructure, such as Ethernet cables, fiber optic cables, or wireless signals.

## 2. Data Link Layer

- ❑ **Function:** The data link layer ensures error-free transmission of data over the physical layer. It handles framing, error detection, and flow control.
- ❑ **Practical Example:** When sending an email, the data link layer includes the Ethernet frame or Wi-Fi frame that encapsulates the email data. It also verifies that the data is transmitted without errors and manages the flow of data between the sender and receiver.

## 3. Network Layer

- ❑ **Function:** The network layer is responsible for routing packets between different networks. It determines the best path for data to reach its destination.
  
- ❑ **Practical Example:** In the case of sending an email, the network layer includes the IP (Internet Protocol) address of the email server and the routing information used to deliver the email packet across multiple networks, such as the internet.



## 4. Transport Layer

- ❑ **Function:** The transport layer ensures reliable delivery of data between sender and receiver. It handles segmentation, error recovery, and flow control.
- ❑ **Practical Example:** When sending an email, the transport layer includes the TCP (Transmission Control Protocol) segment that breaks down the email data into smaller packets for transmission. It also ensures that packets are delivered in the correct order and retransmits any lost packets if necessary.

## 5. Session Layer

- ❑ **Function:** The session layer establishes, manages, and terminates sessions between applications. It provides synchronization and recovery services.
- ❑ **Practical Example:** In the context of sending an email, the session layer involves establishing a session between the email client (e.g., Outlook) and the email server (e.g., Gmail). It manages the communication session, including starting, maintaining, and ending the email session.

## 6. Presentation Layer

- ❑ **Function:** The presentation layer ensures that data exchanged between applications is in a format that the application can understand. It handles data translation, encryption, and compression.
- ❑ **Practical Example:** When sending an email, the presentation layer includes encoding the email data into a format that can be understood by both the email client and server, such as ASCII or Unicode. It may also involve encrypting the email content to protect it from unauthorized access.

## 7. Application Layer

- ❑ **Function:** The application layer provides network services directly to end users and applications. It includes protocols and services for tasks such as email, file transfer, and web browsing.
- ❑ **Practical Example:** Sending an email involves the application layer protocols such as SMTP (Simple Mail Transfer Protocol) used to send the email from the client to the server, and POP3 (Post Office Protocol version 3) or IMAP (Internet Message Access Protocol) used to retrieve the email from the server to the client.

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