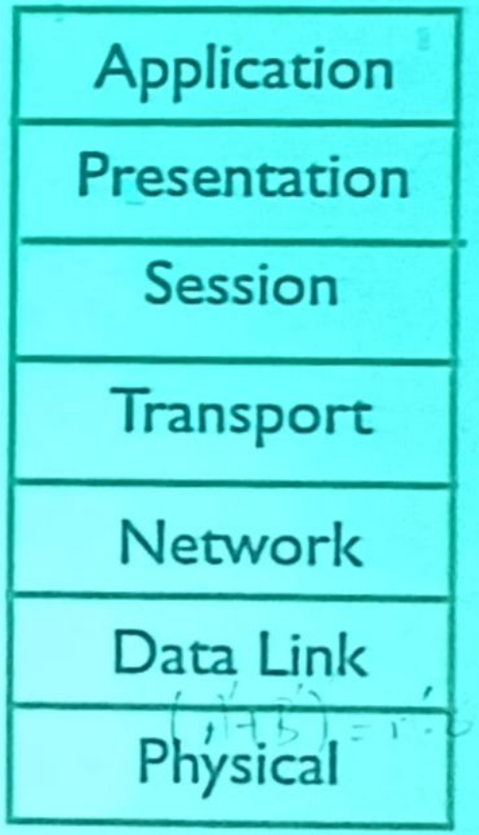
ISO-OSI reference model

Layer 7: Application Layer

The application layer allows users to send files to each other through a network. File transfers can occur over the internet between different networks or within the same network. The application layer also is the layer that allows users to access files, such as from cloud-based storage or a database. People use the application layer to fill out website forms use email services or engage in live chat sessions online. The most common application layer protocols are HTTP, TELNET, DNS, SMTP, and so on.



ISO-OSI and TCP/IP Architecture

ISO-OSI Protocol	TCP/IP Protocol (5 Layer) (ARPANET)	TCP/IP Protocol (4 Layer) (ARPANET)
Application Layer	Application Layer	Application Layer
Presentation Layer		
Session Layer		
Transport Layer	Transport Layer	Transport Layer
Network Layer	Network Layer	Internet Layer
Data Link Layer	Data Link Layer	Network Access Layer
Physical Layer	Physical Layer	

- Process to Process Delivery Data
- Host to Host Delivery (Entire Massage) (TCP/UDP) (Segment)
- Source to Destination Delivery (IP, ARP, ICMP) (Packet/Datagram)
- Node to Node Delivery (Ethernet, IEEE, ATM) (Frame)

Layer 6: Presentation Layer

Translates different data representations from the Application layer into uniform standard format. Providing services for secure efficient data transmission e.g. data encryption, and data compression.

1. Code Conversion (Formatting: EBCDIC-coded text computer file to an ASCII-Coded file)
2. Encryption/Decryption
3. Compression

$(A'+B')' = A' \cdot B'$

Layer 5: Session Layer

Allows two applications on different computers to establish, use, and end a session. e.g. file transfer, remote login. Establishes dialog control. Regulates which side transmits, plus when and how long it transmits. Performs token management and synchronization.

1. Authentication : verifies the user's identity.
2. Authorization : the process of determining if a user has permission to access a file or service.
3. Session Restoration: The session layer creates synchronization points to restore data transfers if they are unexpectedly terminated
4. Webinar Flow Control Synchronization: This protocol ensures that the sender doesn't overwhelm the receiver with too much data.

Layer 4: Transport Layer

Manages transmission packets. Repackages long messages when necessary into small packets for transmission. Reassembles packets in correct order to get the original message. Handles error recognition and recovery. Acknowledges packet delivery by sending an acknowledgment to the transmitter when it receives an error-free packet. Resends missing packets.

1. End to End Delivery (Port to Port)
2. Reliability
3. Error Control
4. Congestion Control
5. Flow Control
6. Multiplexing/Demultiplexing.

$(A'+B')' = A' \cdot B'$

Layer 3: Network Layer

Manages addressing/routing of data within the subnet. Addresses messages and translates logical addresses and names into physical addresses. Determines the route from the source to the destination computer. Manages traffic problems, such as switching, routing, and controlling the congestion of data packets.

1. Source to destination delivery.
2. Logical Addressing
3. Routing
4. Fragmentation
5. Congestion Control

Layer 2: Data Link Layer

Packages raw bits from the Physical layer into frames (logical, structured packets for data). Provides reliable transmission of frames
It waits for an acknowledgment from the receiving computer.
Retransmits frames for which acknowledgement not received.

1.Node to Node delivery
2.Flow Control
3.Error Control
4.Access Control

$(A'+B')' = A'.B''$

Layer 1: Physical Layer

1. Cables and Connectors
2. Physical topology
3. Hardware's (Repeaters, Hubs)
4. Transmission mode (Simplex/ Duplex)
5. Multiplexing
6. Encoding

Transmits bits from one computer to another. Regulates the transmission of a stream of bits over a physical medium. Defines how the cable is attached to the network adapter and what transmission technique is used to send data over the cable.

Deals with issues like:-
The definition of 0 and 1, e.g. how many volts represents a 1, and how long a bit lasts?
Whether the channel is simplex or duplex?
How many pins a connector has, and what the function of each pin is?

Encapsulation