Open System Interconnection (OSI) Specifications

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1 What is OSI Reference Model?

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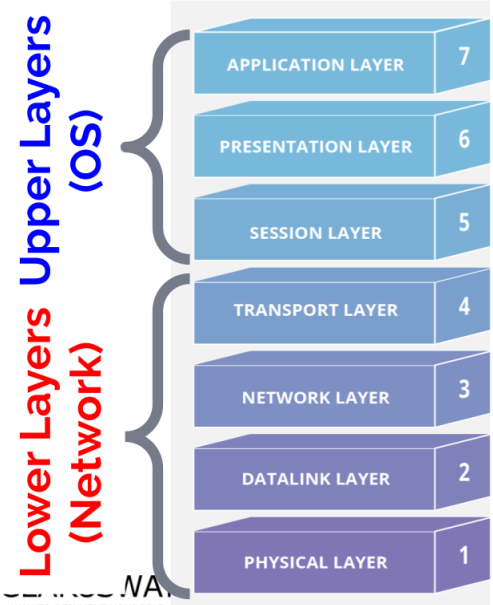
What is OSI Reference Model?

The **OSI** provides a standard for different computer systems to be able to communicate with each other

Developed by ISO in 1984

What is OSI Reference Model?



- Human-computer interaction layer, where applications can access the network services
- Ensures that data is in a usable format and is where data encryption occurs
- Maintains connections and is responsible for controlling ports and sessions
- Transmits data using transmission protocols including TCP and UDP
- Decides which physical path the data will take
- Defines the format of the data on the network
- Transmits raw bit stream over the physical medium

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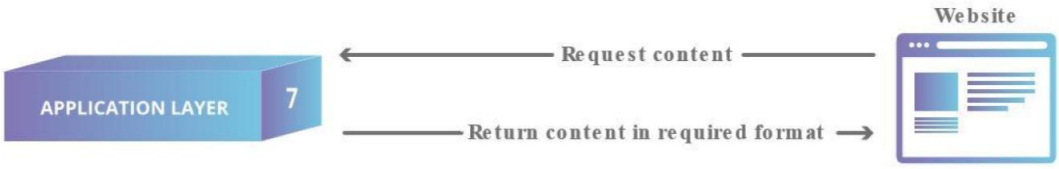
Layers of the OSI Model

Physical Layer
Data Link Layer
Network Layer
Transport Layer
Session Layer
Presentation Layer
Application Layer

Application Layer (Layer 7)

- Directly interacts with data from the user
- Software applications (web browsers, email clients, etc.) rely on the application layer to initiate communications

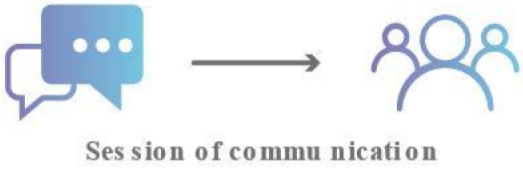


Presentation Layer (Layer 6)

- Primarily responsible for preparing data
- Translates, encrypts, and compresses data

Session Layer (Layer 5)

- Responsible for opening and closing communication between the two devices
- The time between when the communication is opened and closed is known as the session
- Synchronizes data transfer



Transport Layer (Layer 4)

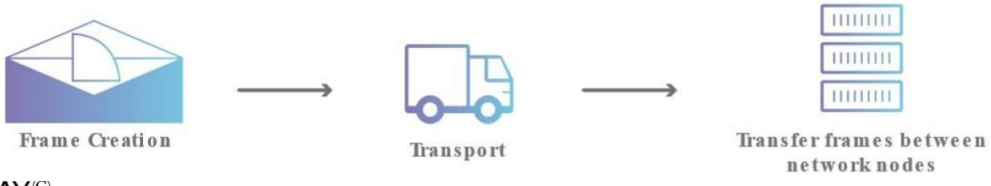
- Responsible for end-to-end communication between the two devices
- Takes data (from upper layer) and breaks into segments
- Responsible for flow control and error control

Network Layer (Layer 3)

- Facilitates data transfer between two different networks
- Takes data segments (from upper layer) and breaks into packets

Data Link Layer (Layer 2)

- Facilitates data transfer between two devices on the same network
- Takes data packets (from upper layer) and breaks into frames
- Responsible for flow control and error control



Physical Layer (Layer 1)

- Includes physical equipment
  - cables
  - transceivers
  - etc.
  - repeaters
  - media converters
  - modems
  - hubs
- Data is converted into bit streams

Data Encapsulation

- For two nodes communicate they must use the same protocol
- Each layer *(OSI or DoD)* communicates with its equivalent layer on the other node via the lower layers of the model
- Each layer provides services for the layer above and uses the services of the layer below

Data Encapsulation