# General Networking

All things general networking (i.e., subnetting, OSI Model, packet analysis, etc.)

- Open Systems Interconnection Model

# Open Systems Interconnection Model

The OSI (Open Systems Interconnection) model is a theoretical framework that describes how communications should occur between different systems in a network. The OSI model defines seven layers of communication, each with a specific function and role in the overall process. These layers include the physical layer, data link layer, network layer, transport layer, session layer, presentation layer, and application layer. Each layer communicates with the layer directly above and below it, and together they form a complete communication process. The OSI model is important because it provides a consistent way of thinking about and troubleshooting communication issues in a network.

The OSI model can be used for understanding and designing communication protocols in a computer network. It is divided into seven layers, each responsible for a different aspect of network communication:

1. Physical Layer: Deals with the physical connections and transmission of data
2. Data Link Layer: Handles the transfer of data between devices on a single network segment
3. Network Layer: Routes data packets between multiple network segments
4. Transport Layer: Provides end-to-end communication and error checking
5. Session Layer: Establishes, maintains, and terminates connections between applications
6. Presentation Layer: Formats and encrypts data for application use
7. Application Layer: Enables communication between applications and the network

Each layer communicates with the layer directly above and below it, and together they provide the functionality needed for communication across a network. The OSI model is a widely used reference model for network communication and is used as a basis for many other communication protocols.

| Layer | Name | Role | Protocols | PDU | Address |
|---|---|---|---|---|---|
| 7 | Application | Initiates contact with the network | http, https, ftp, smtp | Data | |
| 6 | Presentation | Formats data, optional compression, and encryption | | Data | |

| Layer | Name | Role | Protocols | PDU | Address |
|---|---|---|---|---|---|
| 5 | Session | Initiates, maintains, and tears down session | | Data | |
| 4 | Transport | Transports data | TCP, UDP | Segment, Datagram | Port |
| 3 | Network | Addressing and routing | IP, ICMP | Packet | IP |
| 2 | Data Link | Frame formation | Ethernet II | Frame | MAC |
| 1 | Physical | Data is transmitted on the media | | Bits | |