

Introductory Networking

- Open Systems Interconnection (OSI) model
 - Demonstrates theory behind networking
 - More compact TCP/IP model that real-world is based on
- OSI
 - application
 - presentation
 - session
 - transport
 - network
 - Data Link
 - physical
- Application - 7
 - Provides networking options to programs on a computer
 - Interface for applications to transport data
- presentation - 6
 - Receives data from application layer
 - Translates data into standardized format
 - handles encryption, compression, or other transformations

• Session - 5

- Looks to connect to other computer
 - If not throws error and stops
- Maintains connection, SYNC communication
- Session is unique to communication
 - knows 2 tasks in order for binary
- When successfully logs a connection, puts data

• Transport - 4

- Choose protocol
- Transmission Control Protocol (TCP) favors accuracy
- User Datagram Protocol (UDP) favors speed
- Divides data into bytes (segments or datagrams respectively)

• Network - 3

- ~ Locates destination at request
- Takes IP and finds best route

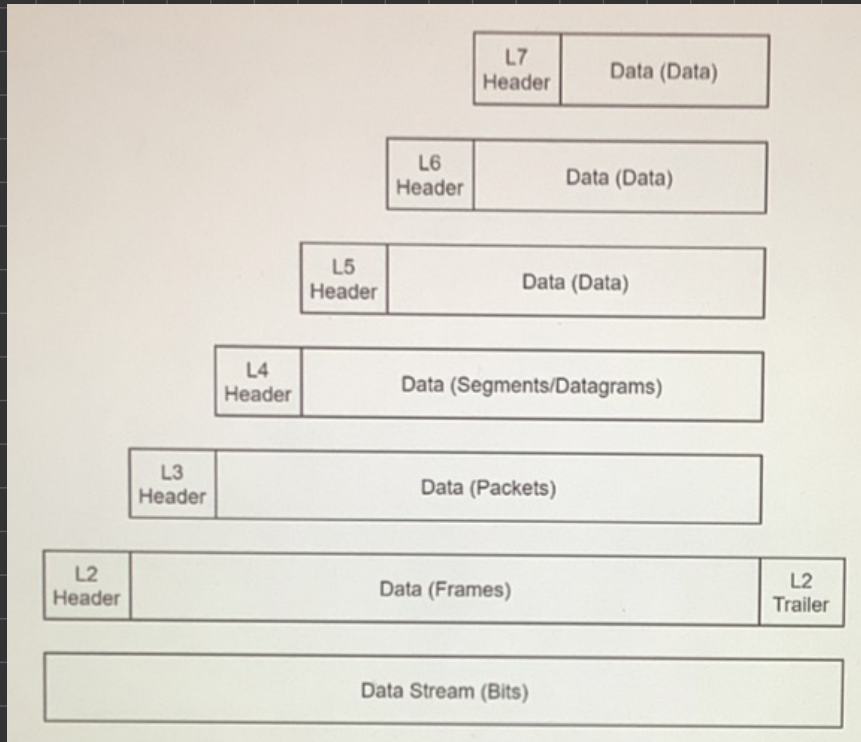
• Data Link - 2

- Preserves data suitable for transmission
- Shows Network Interface Card (NIC)
the correct Media Access Control (MAC) address

• Physical - 1

- Actual electric pulses
- Convert Binary into pulse signals (vice-versa)

• Data as it's transported



TCP/IP Model

TCP/IP
Application
Transport
Internet
Network Interface

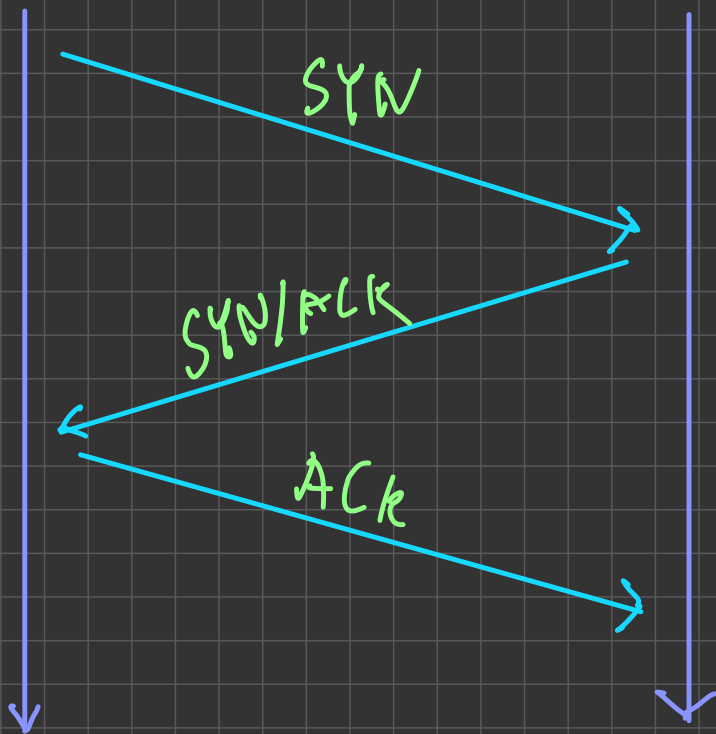
How do two compute?

OSI	TCP/IP
Application	Application
Presentation	
Session	
Transport	Transport
Network	Internet
Data Link	Network
Physical	Interface

Three-way Handshake

Client

Server



1. Client sends SYNchronize bit
"I want to connect"
2. Server sends SYNchronize bit and ACKnowledgement bit
"I understand you want to connect, acknowledge"
3. Client sends ACKnowledgement bit
"I acknowledge you as the server"

This completes the handshake

Basics of 'ping'

- Tests if connection is possible

```
$ ping TARGET
```

Basic arguments

- i set interval of pings
- y only ipv4
- v set verbose

Basics of 'traceroute'

- Map path to target machine

```
$ traceroute TARGET
```

- Returns:

```
$  
HOP# LOCATION (IP) TIMING
```

Basics of 'whois'

- Looks into domain name info

```
$ whois TARGET
```

Basics of 'dig'

- Gets DNS info

```
$ dig TARGET
```