OSI Model & TCP/IP SUITE

⊛ What is Networking Model ?

Networking model categorize & provide a structure for networking protocols & standards.

↳ A set of rules defining how networking devices & software should work

⊛ OSI Models.

↳ Open System Interconnection Model
↳ A conceptual model that categorizes & standardizes the different functions in a network.
↳ Created by the 'International Organizations for Standardization' (ISO)
↳ functions are divided into 7 layers
↳ These layers work together to Make the Network Work.

Application
↳ This layer is closest to the end user
↳ Interact with software application, for example your
↳ web browsers. (Brave, firefox, chrome, etc)
↳ HTTP & HTTPS are layer 7 protocols
↳ ~~layer7 doesnot include application itself like chrome & firefox but the protocols that interact with the application like http & https.~~

⑦ Application
⑥ Presentation
⑤ Session
④ Transport
③ Network
② Data link
① Physical

functions of layer 7 include:
↳ Identifying communication partners
↳ Synchronizing communication

• Presentation
↳ Data in the application layer is in 'application format'
↳ It needs to be 'translated' to a different format to sent over the network.
↳ The presentation layer's job is to translate b/w application & Network formate.
↳ For Example:-
Encryption of data as it is sent & decryption of data as it is received.
↳ Also translates b/w different Application layer formats.

• Session
↳ Control dialogues (sessions) b/w communicating hosts. Establishes, manages, & terminates connections b/w the local application [for ex. your web browser] & the ~~network~~ remote application (for example, YouTube)

⑦ Application
⑥ Presentation
⑤ Session
→ Network engineers don't usually work with top 3 layers
→ Application developers work with the top layers of the OSI Model to connect their application over network.

↓
Data

- Transport
  - ↳ Segment & reassembles data for communications blw ends host.
  - ↳ Breaks larger pieces of data into smaller segments.
  - ↳ Which can be more easily sent over the network & are less likely to cause transmission problems if errors occur.
  - ↳ Provide host-to-host communication.

Data	L4 Header

↳ Segment

- Network
  - ↳ Provides connectivity between end hosts on different Network (i.e outside the lan)
  - ↳ Provides logical addressing (IP addresses)
  - ↳ Provides path selection blw source & destination
  - ↳ Routers operate at layer 3.

Data	L4 Header	L3 Header

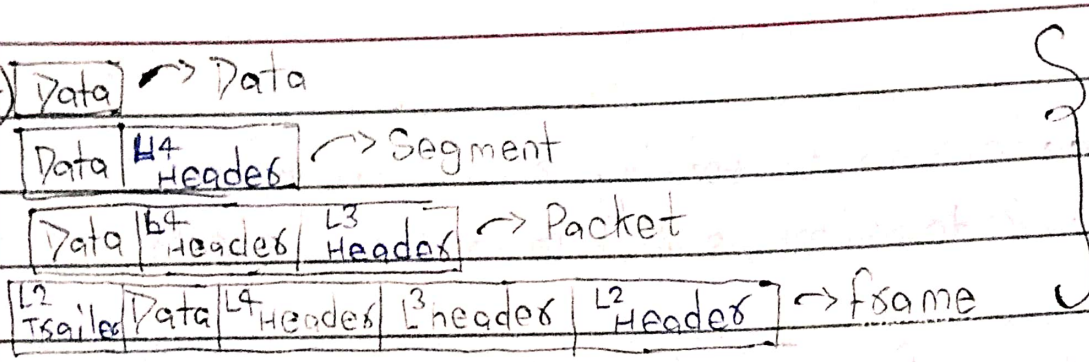
↓ Packet

- Datalink
  - ↳ Provides node to node connectivity & data transfer (for example, PC to switch, switch to routes, routes to routes),
  - ↳ Defines how data is formatted for transmission over a physical medium [for ex- copper UTP cables]
  - ↳ Detects & (possibly) corrects Physical layer errors.
  - ↳ Uses layer 2 addressing, separate from layer 3 addressing.
    - Moves data b/w devices on the same Network.
    - Uses MAC addresses to find right device
    - Detects & fixes some errors.

L2 Trailer	Data	L4 Header	L3 Header	L2 Header

↳ FRAME

- Physical
  - ↳ Define physical characteristic of the medium used to transfer data b/w devices
    for example, voltage levels, maximum transmission distance, physical connectors, cable specifications etc.
    Digital bits are converted into electrical [for wired connection) or radio [for wireless connection) signals.
    All of the informations in Day's 2's video (cables, pin layouts, etc) is related to physical layer.



⊛ TCP/IP Suite

↳ Conceptual model & set of communication protocols used in the internet & other network.

↳ known as TCP/IP because those are two of the foundational protocols in the suit.

↳ Developed by the United States Department of Defense through DARPA (Defense Advanced Research Project Agency)

↳ Similar structure to the OSI Model, but with fewer layers.

↳ This is the model actually in use in modern Network.

↳ NOTE: The OSI Model still influences how network engineers think & talk.

⊛ OSI VS TCP/IP

OSI Model		TCP/IP Suit
⑦ Application ⑥ Presentation ⑤ Session	→	4] Application
④ Transport	→	3] Transport
③ Network	→	2] Internet
② Data Link ① Physical	→	1] Link