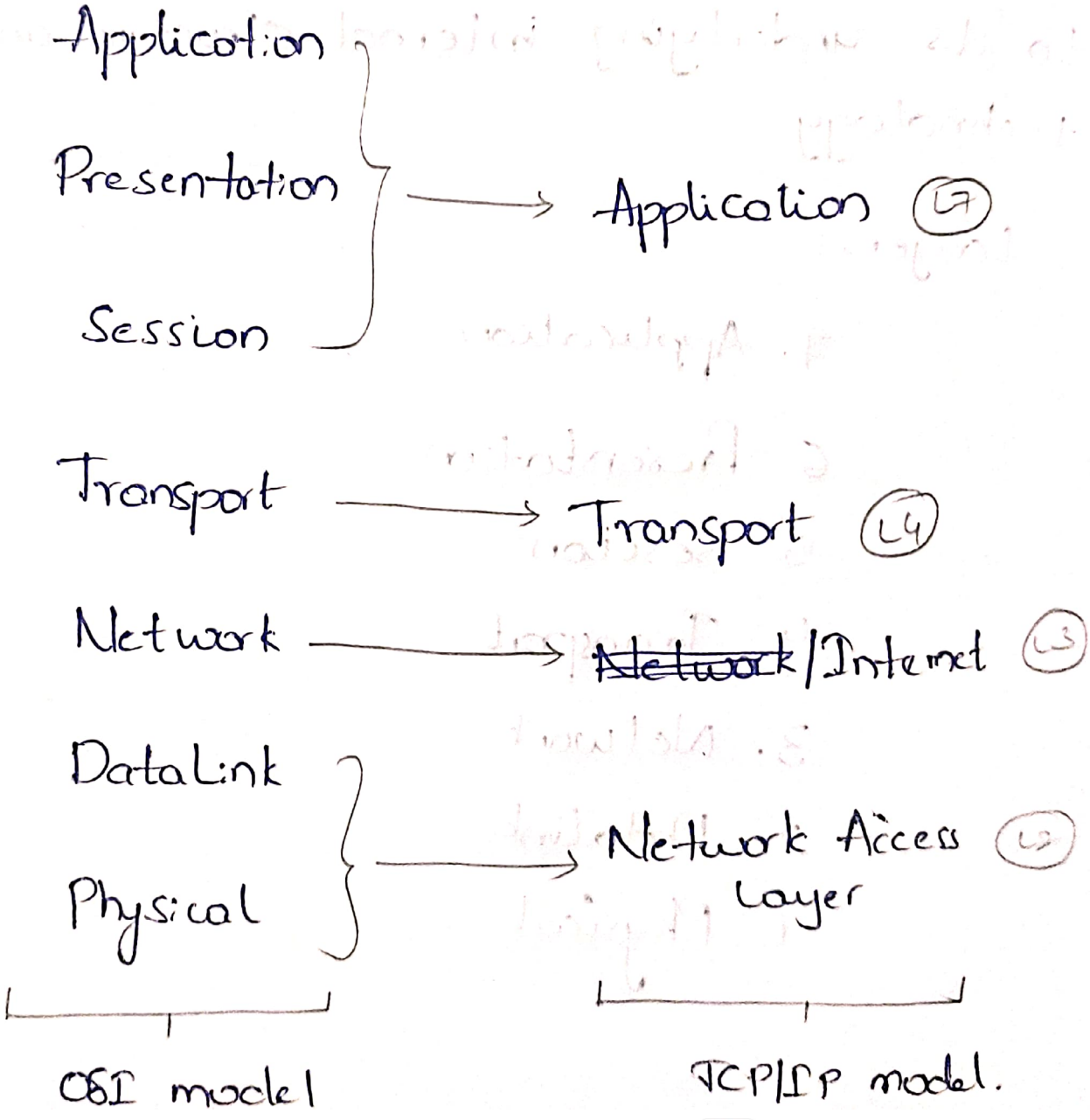
24/11/2024

- OSI – standard reference model for any type of communication

TCP/IP – reference model for Data Communi
It is derived from OSI layer model

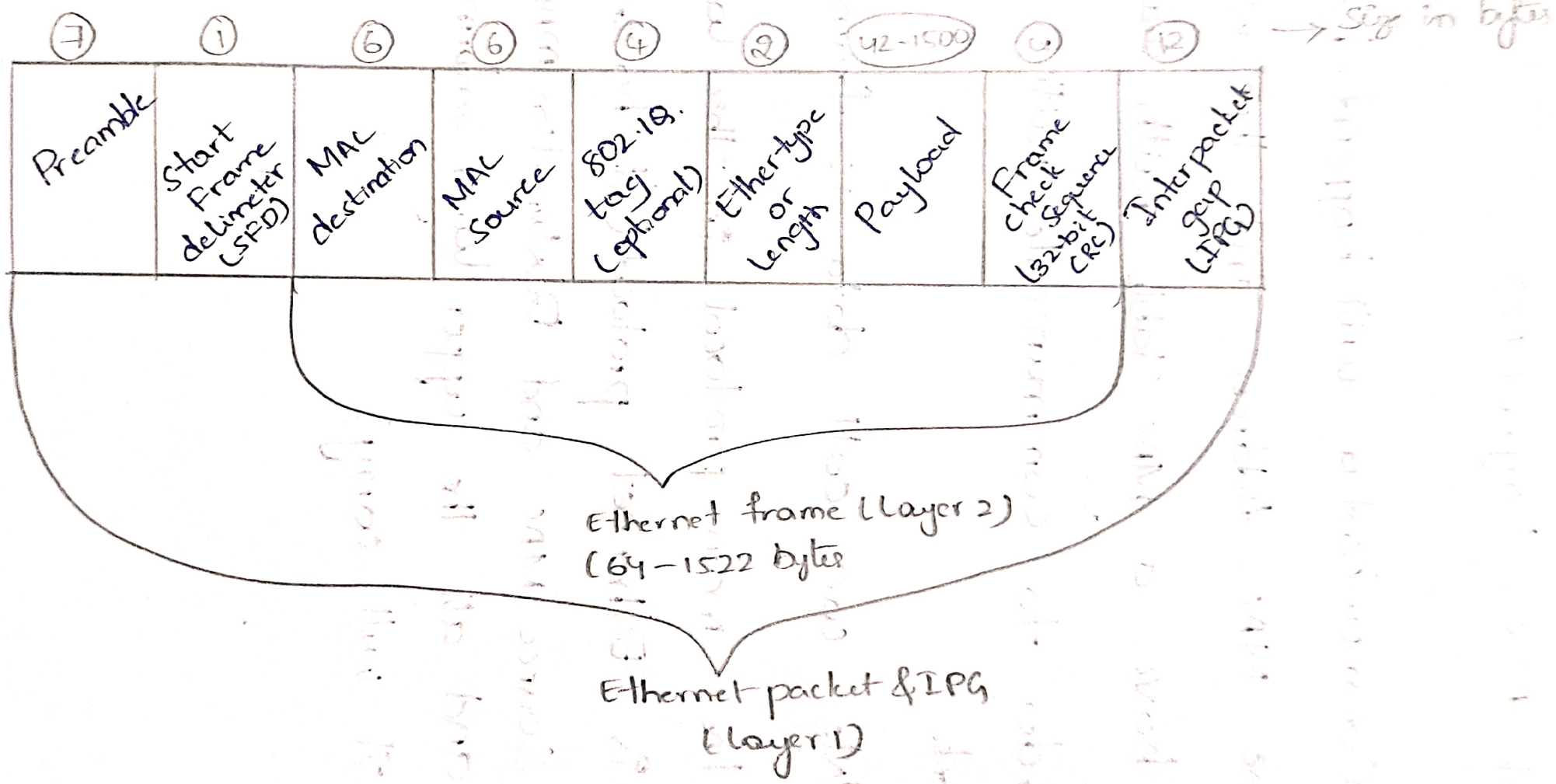


Network Access Layer (L2)

- Communication will happend based on the MAC Address and then we will have a MAC Table with switch in order to communicate within the network.

- We can call data as frames

- The main protocol in this layer is Ethernet protocol (It having Source MAC and Destination MAC and all the upper layer information it will carry)



Ethernet packet and frame structure

5. Ethertype or length

It is 2 bytes

→ 16 bit

→ 0 to 65535

⇒ If it is <1536, this is used for length

→ >1536 then it is used for type field.

⇒ Type field having upper layer protocol information

→ length is size of frame.

1 Preamble

- It is a 7 byte field that contains a pattern of alternating 0's and 1's.
- It alerts the stations that a frame is going to start.
- It also enables the sender and receiv to establish bit synchronization.

2. Start frame Delimeter (SFD):-

- It is a 1 byte field which is always set to 10101011.
- The last two bits "11" indicate the end of Start frame Delimeter and marks the beginning of the frame.

(Preamble and SFD provides the synchronization between the sender and receiver)

3. Destination Address

- It is a 6 byte field that contains the MAC Address of the destination for which the data is destined.

4. Source Address

- It is a 6 byte field that contains the MAC address of the source which is sending the data.

6. Data (or) Payload

- Payload can be 42 bytes if an 802.1Q tag is present. without tag minimum is 46 bytes.
- It is a variable length which contains the actual data.
- Thus, in a Ethernet frame, minimum data has to be 46 bytes and maximum data can be 1500 bytes.

7. Frame Check Sequence (CRC):-

CRC - Cyclic Redundancy Check

- It is a 4 byte field that contains the CRC code for error detection.

8. Interpacket gap:-

- The inter-packet gap (IPG) in Ethernet is the time interval between packets.
- This is a minimum idle time of 96 bit-times (12 bytes) that occurs between the transmission of two Ethernet frames.
- During this time, the network remains idle (no data transmitted) to allow the devices on the network to:
  1. Recover from the previous transmission
  2. Prepare for the next frame transmission
  3. Avoid collisions in half-duplex environments

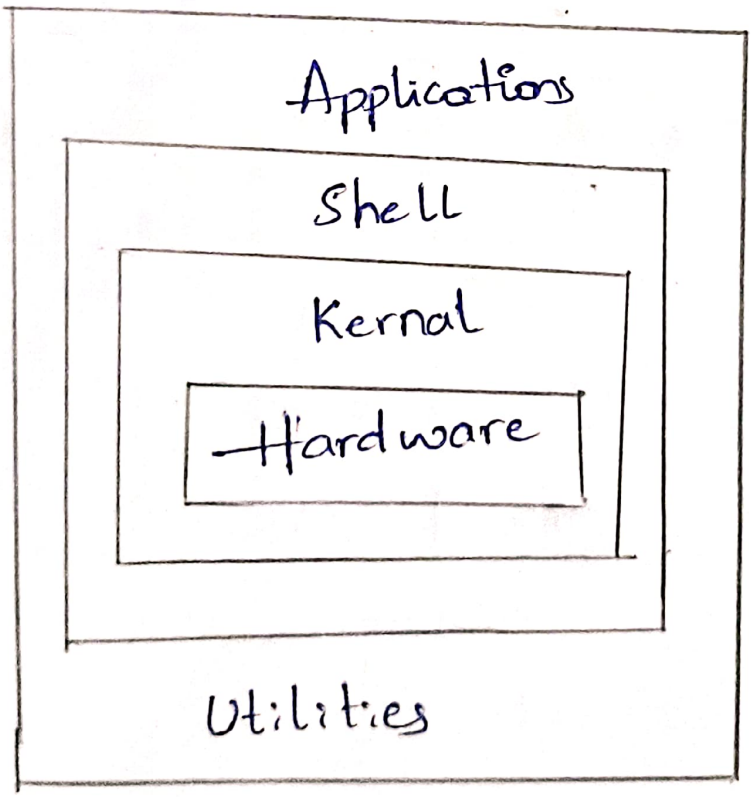
Linux

Linux is a multiuser and multitasking Operating System. It is more secure compare to windows.

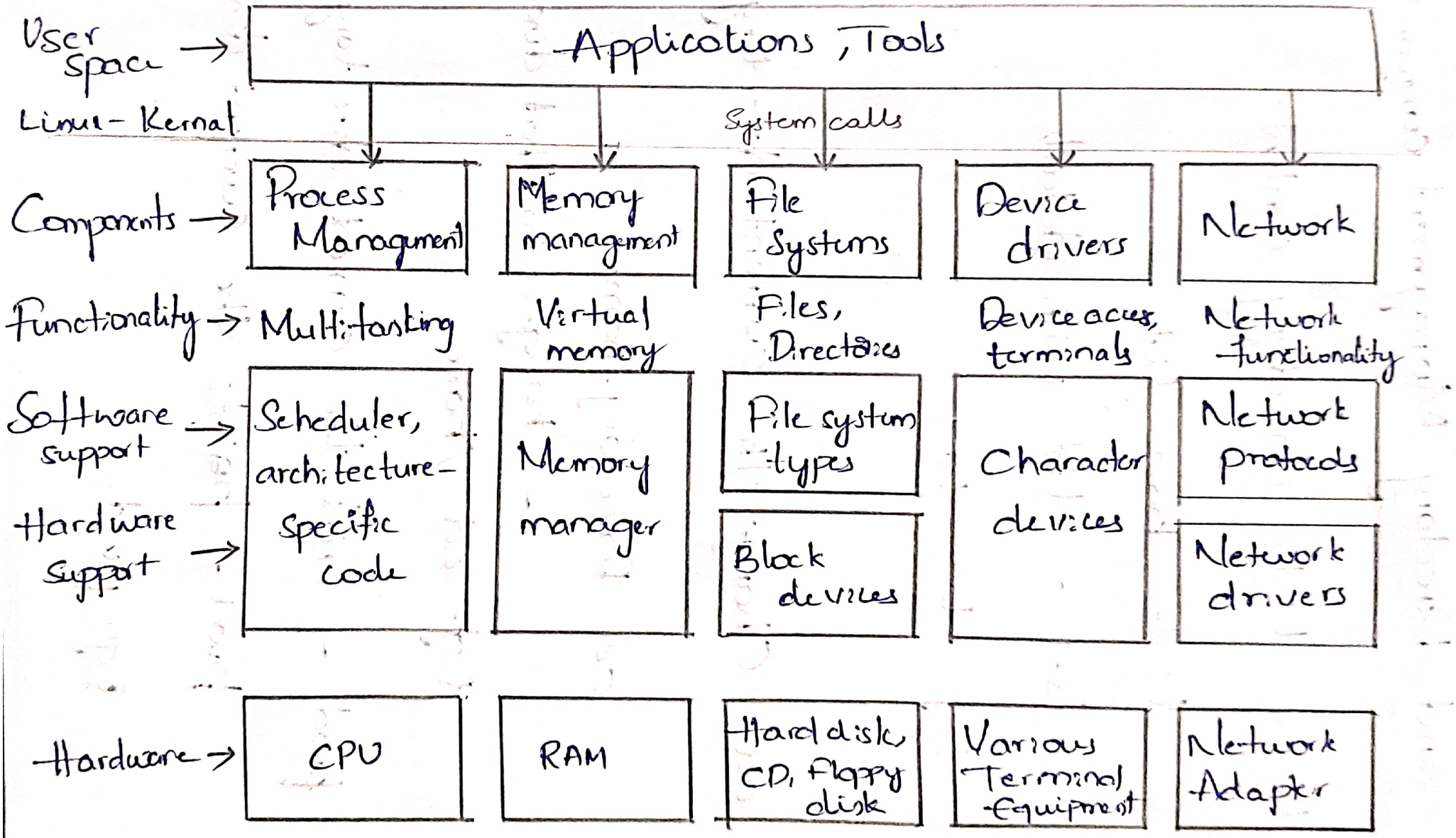
- It is free and opensource.

Command to install any package in linux

→ sudo apt install (package-name).



Structure of Linux Kernal



File and Directory Management commands

1. ls – Lists directory contents.

   ls – Basic list

   ls -l – List with details

   Eg:- ls -la (shows all files with detailed information)

2. cd – Change the current directory

   cd Directory_name

   – changes to that directory

   Eg- cd /home.

3. pwd – Print the current directory path.

   pwd – points the current directory

   Eg:- pwd.

④ mkdir — Create a new directory

mkdir Directory-Name

— Creates that directory

Eg:- mkdir Directory_Name.

⑤ rmdir — Remove an empty directory

rmdir Directory_Name

— Deletes that directory

Eg:- rmdir Directory_Name.

⑥ rm — Deletes files and directories

rm file_Name — Deletes file

Eg:- rm -rf file_Name.

(7) cp – Copy files or directories

cp file new_file

– Copies 'file' to 'new_file'

Eg:- cp file new_file

(8) mv – Move or rename files and directories

mv file new_file

– Renames 'file' to 'new_file'

Eg:- mv file new_file

(9) touch – Create an Empty file

Eg:- touch file

(10) cat – Concatenate and display file contents

Eg:- cat file.