

* Difference b/w hardware, firmware, software?

* Hardware - The term hardware is used to refer to physical components of any electronic device such as the CPU, peripheral devices and its memory.

* It is the physical world of device.

* It is complete unit or device.

* It can be changed after production.

* It is body of the device.

eg keyboard, remote, speakers.

* Hardware can not operate without a firmware.

* Firmware - Firmware is a set of instructions or programs written in machine language which are used to operate hardware.

* It is the set of instructions.

* It is stored in hardware.

* Can not be changed after production only updates.

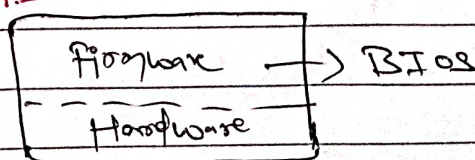
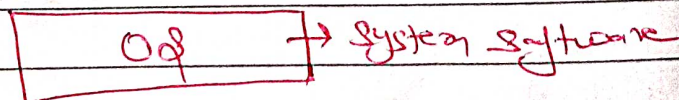
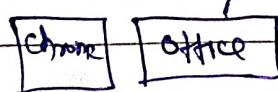
* It is the heart of the device.

* eg → PC BIOS, Timing, and Control Mechanism of washing machine, TV program & Remote & microprocessor.

* Firmware operates on a hardware.

* BIOS is only appropriate for referring to the start up firmware of the motherboard itself.

* Application Software



* Software - A collection of instructions that tells the computer how to perform a particular task.

↳ Two type → System and Application Software.

* Software generally stored in non accessible memory.

* Software changed constantly.

* Software can be very big while firmware usually smaller.

eg → OS, MS Office, Paint, Chrome.

* Transmission Mode in Computer Network -

↳ Transfer data b/w two device.

* Simplex Mode - Communication is unidirectional.

→ only one device will link, can transmit, other will receive.

① Sender → Receiver

② (Client - Server model)

③ FM receiver, TV → Receiver.

④ Keyboard → always give inputs

* Half Duplex - Each station can both transmit and receive, but not at the same time.

→ when one device sending, other will receive only.

Step → ① Sender ^{TX} → Receiver
Receiver Device (A) Device (B)

② Sender ← Receiver
Device (A) Device (B)

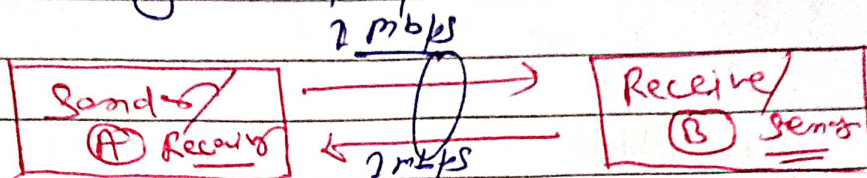
eg → walky-talky

* If both will start sending signal packet they packet will drop (they merge).

- * Full Duplex Mode - Both station can transmit and receive simultaneously. Capacity of the link is shared among two.

eg → Telephone.

2 mbps



→ both look like sender and receiver.

- * OSI Model (Open System Inter Connection)

→ 1976 → started → implemented → 1986

→ Reference model → OSI → TCP/IP has been used practically.

- * They have 7-layers.

* Sender side Layer 1 → Application Layer

* Receiver side Layer 1 → Physical Layer

- * Layer 1 → decide whether you are for sender side or receiver side.

* Sender

Receiver

Software Layers	Application Layer	→ Apply (for each)	Application Layer
	Presentation Layer	→ Presentation	Presentation Layer
Hardware Layers	Session Layer	→ SMC	Session Layer
	Transport Layer	→ TR	Transport Layer
	Network Layer	→ Network	Network Layer
	Data Link Layer	→ DL	Data Link Layer
	Physical Layer	→ PP	Physical Layer

* (People seems To Need Data Processing)

- * Let's discuss with story -

→ Suppose we have company, they have 7 working employees.

* Full Story

Date

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Prasun

- ① Andy tell prasun that we have to send 400 pages to other company receiver till evening.
- ② prasun tooked 400 pages but the all the pages written in french language.
- ③ prasun knows that Receiver side (Applied?) have read know english so they converted into English.
- ④ After that they give to SMC.
- ⑤ SMC call to receiver side session mngs (SMC2)
She ask him today we will send 400 page, if you receive till evening please confirm it.
- ⑥ After that SMC give all 400 pages to TR.
- ⑦ TR looks smartly they divide all 400 pages into

100	100	100	100
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 → 4 blocks

1234

 → envelope
(4 → bundle)
- ⑧ If one of bundle missed during sending then out 3 will go to receiver side.
- ⑨ TR give to Niket, & Niket tell all the envelope (from) address → the destination with road map.
- ⑩ Niket give it to D.C then, D.C saw envelope is open, D.C seal back all the envelope.
- ⑪ Finally envelope is at PP, it will give to Layer 2 of Physical Layer.
- ⑫ Now, Envelope go to physical layer receiver side, now, data link will check the information is packed & sealed they give it to N/W layer side.
- ⑬ Transport layer will confirm all 4 boxes will be reached.
- ⑭ Now, session layer (SMC2) will confirm to SMC and told him envelope received & connection aborted.

* Application Layer → user interface (Gmail)
(HTTP, FTP, Telnet)

* Presentation Layer → how present data.

Encryption/Decryption

egs x.mp3 → this will tell how to data present.
x.docx

* Session Layer → (End to End Layer) → keep in touch
with receiver session layer.

② provide logical path.

* Transport Layer → Segmentation.

(TCP/UDP)

↳ Data not lost fast data transfer some data loss

* Network Layer → Route Layer. (Route tell)

* Data Link Layer →

① Flow Control of data

② Transmission of error

③ Provide interface to n/w layer

* Physical Layer → change bit / bits.

* Transport Layer → Segments

↓

n/w Layer → Packet

↓

Data Link Layer → Frame

↓

Physical Layer → Bits