Computer Networking :

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- The Internet society maintains the protocols of the internet.

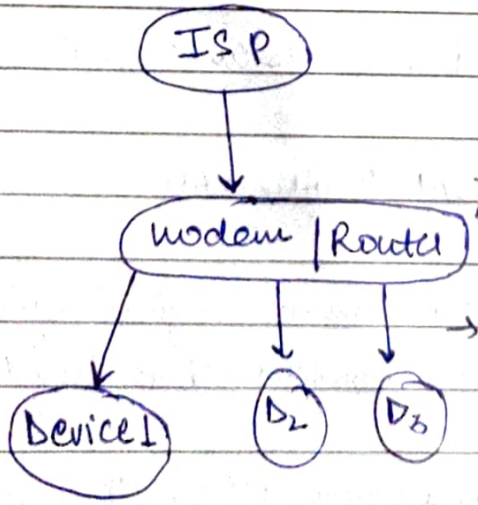
- Protocol → . ICP : Transmission control Protocol
TCP ensures 100% of data will reach its destination & it will not be corrupted on the way. Eg- Email

- UDP: When we don't care if 100% of data reaches the user or not. (User datagram Protocol). Eg. Video conference

- HTTP → (Hyper text transfer protocol) used by web browser, defines format of data ~~to~~ that is transffered, Eg → like how will server ~~will~~ sent back the data to client.

* Data transfered from server will be in form of packets.

* IP address



→ Modem has a global IP address

→ Modem gives devices a local ip address via DHCP protocol

* If D2 makes a request to google global ip will request to google. Now Modem ~~gives~~ returns request to D2.

* IP address decides which devices to send the data, but how we decide which application to send the data (eg. MongoDB wants some files) ?

Ans → we do that via Ports.

→ IP identifies device, port identifies the application

* HTTP stuff is done on port = 80

→ every port number has 16 bits, Total number that can be generated = $2^{16} \approx 65000$
- 0 – 1023 : reserved ports
- 1024 – 49152 : Application port (eg SQL → 1433)

- 1mbps → 10^6 bits/sec
- 1gbps → 10^9 bits/s
- 1kbps → 1000 bits/sec

* all countries are connected to each other & share info via submarine cables, buried underwater in oceans.

* On smaller level computers are connected via LAN, WAN, MAN.

* Internet is coll^n of LAN, & MAN, WAN.

* MODEM → device that converts digital signal to analog signal
ROUTER → device that routes packets based on ip address.

* ~~ISP~~ We request data from ISP, ISP request data from Tier 1 ISP.

- In India key Tier 1 ISP is TATA, Tier 2 are Airtel etc
- TATA has submarine cable from (chennai to ~~sing~~ Singapore ...)

OSI Model (Open systems interconnection model)
- VVIP !!! (asked in META)
- Develop to standardize how two or more computers connect to each other

7 layer Model : (i) Application layer (ii) Presentation layer (iii) Session layer (iv) Transport layer (v) Network layer (vi) Data link layer (vii) Physical layer

Summarization:

- User sent data in application through application layer, it is implemented in software.
- Data is transferred to ~~transport layer~~ presentation layer, presentation layer converts the data into machine readable binary language (translation), embeddation, encryption, abstraction, SSL protocol these things occur in presentation layer
- Session layer → helps in setting and managing connection and ~~end~~ enables sending & recieving of data, authentication & authorization takes place. Eg Session is created when order is placed to payment option.

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- Transport layer - transports the data to reciever : occurs in 3 parts (i) Segmentation : data recieved from session layer is broken into packets called segment. Every segment contains recievers port number and sequence number

- Network layer - transmission of recieved data segment from 1 computer to another that is located in a different network. Router lives in Network layer. Network layer assigns senders and reciever's ip address to every segment and form an IP packet, so that every data packet can reach correct destination. Load control also occurs in Network layer

- Data link layer - allows you to communicate with the computer/host, recived data packet from network layer, Data link layer does assigning
(i) Logical assigning (ii) Physical addressing : What application to send data to, MAC address of sender and reciever is assigned to data packets

Physical layer - data from above is recived, convert it into data frame