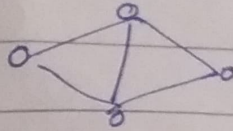
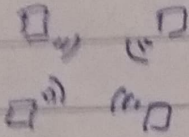


## Network

- set of devices connected
- enable devices to communicate with another and share data



## Network Reliability

- ① Failure of frequency
- ② Downtime - time it takes to recover

## Bandwidth

- range of limit b/w it's upper & lower 2

connection by physical medium is called Link. (coaxial cable, optical fibre)

A network consist of -:

- ① host devices - pc, mobile, printer, etc.
- ② networking devices - switches, router



1. LAN (Local Area Network)
3. WAN (Wide " " )
2. MAN (Metropolitan " " )
- SAN (Storage Area Network)
4. GAN (Global " " )



## POP3 (Post office Protocol version 3)

- listens on port 110,
- access mail service on a client machine.

POP (check mail)

SMTP (send mail) Simple Mail Transfer Protocol

### 2 modes

- Delete Mode
- Keep Mode

SMTP is MTA (Mail Transfer Agent)

HTTP - foundation of data communication for WWW (World wide web)



MAC OS & MAC Address are 2 diff things.

classmate

Date

Page

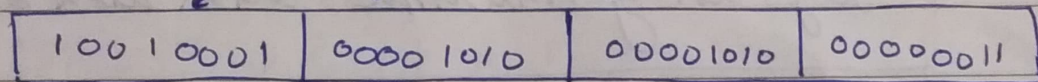
## MAC (Media Access Control)

- address of device, identified at Media Access Control Layer of Network Architecture.

## IP (Internet Protocol)

unique 32 bit of address of a node in network

145.10.34.3



8 4 2 1

$8 \times 4 = 32 \text{ bit}$

## To use Internet

ISP (Internet Service Provider)

- proxy server  
or

## NAT (Network Address Translation)

Sub-netting → divide large network into smaller networks

- Reduce network traffic
- Size of Routing table.
- Secure network.



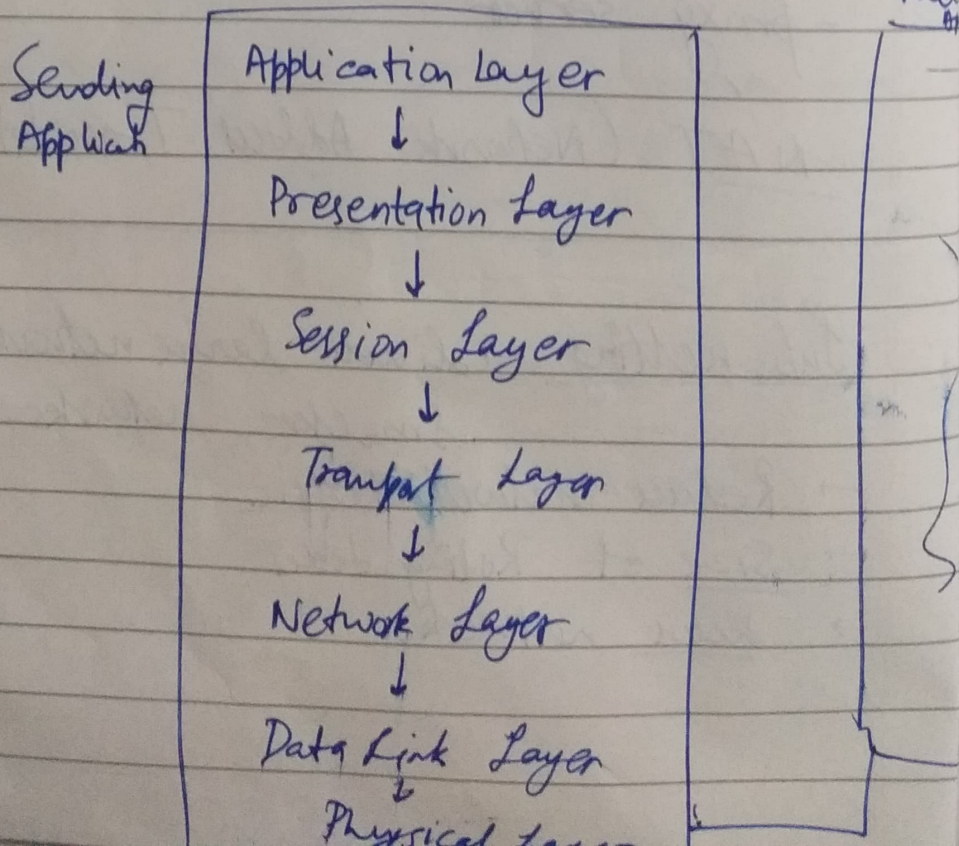
## ADS (Active Directory Structure)

## RAID

- Redundant Array of Inexpensive Disks
- " " " Independent "
- providing fault tolerance, by using multiple hard disk drives

## OSI (Open System Interconnection)

- framework for network design and operation.
- 7 logical layers





## Protocols

FTP	-	File Transfer Protocol	
SMTP	-	Simple Mail Transfer Protocol	
TCP	-	Transmission Control Protocol	
Telnet	-	Telephone Network	
HTTP	-	hyper text transfer	"
MTP	→	Media Transfer	"
SFTP	→	Secure File Transfer	"
SSL	→	Secure Socket Layer	
<u>TLS</u>	→	Transport Layer Security	
POP	→	Post Office Protocol	
NTP	→	Network Time	"
PPP	→	Point to Point	"
NNTP	→	Network News Transfer	"
IMAP	→	Internet Message Access	"

---



To connect 2 devices  
both devices should have  
NIC (Network Interface Card)

③ → This has a RJ-45 (port)  
(Registered Jack-45)  
① - connect via ethernet cable.

② - Each NIC card has a unique MAC address,  
↓  
6 bytes long (hexadecimal format)

00-50-56-C0-00-01

└──────────┘ └──────────┘

3 bytes  
(vendor ID)

(NIC ID)

[ Organizationally  
Unique Identifier ]

[ Network Interface  
Controller Specific ]

④ NIC also has IPv4 (Internet Protocol Address)

IP Address - range from 0 to 255

$$8 \times 4 = 32 \text{ bit}$$

$$172 \cdot 16 \cdot 254 \cdot 1$$

↓

$$10101100 \cdot 00010000 \cdot 11111110 \cdot 00000001$$

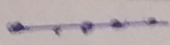

$$1 \text{ bit} = 8 \text{ byte}$$



# Topology

## A) Physical Topology

- represent physical layout of the network.

- Bus -  bidirectional
- full Mesh - (most reliable) (most expensive difficult)
- Star 
- Ring - unidirectional.
- Dual Ring - opp direction.

ISO ( International Organization  
for Standardization)

created. OSI Model

[ open System Interconnection ]

7.	Application Layer	[ Application
6.	Presentation Layer	
5.	Session Layer	
4.	Transport Layer	[ Transport
3.	Network Layer	[ Internet
2.	Data Link Layer	[ Network Address
1.	Physical Layer	

TCP / IP Model



## Proxy Server

Server b/w Client & Internet.

## Mail Server

Incoming

POP3 Port 110

IMAP Port 143

HTTP Port 30

Outgoing

SMTP Port 25