

~~Hub~~

~~Switch~~

Repeater

hub

Bridge

Router

Switch.

Two port

physical  
layer and

data

physical  
layer

physical  
layer and  
data link  
layer

P, D, and  
N-L

Physical,  
Data link  
layer

Two  
port  
device

Multi  
port  
device

Two  
different  
connections  
(one is supposed  
one is followed  
T. ring, other  
Bus)

Multiple  
network  
connection  
possible  
(WAN)

Multiport  
bridges.

data.  
Forward

data  
Forward

data Forward  
based on  
Mac address

data forward  
based on  
MAC and  
logical  
address

data forward  
MAC  
address

No filtering  
Broadcast

No filtering  
broadcast

used  
table,  
filtering  
possible.

Filtering  
based on  
routing  
table

Filtering

M<sub>1</sub>, M<sub>2</sub>, M<sub>3</sub>, M<sub>4</sub>

Repeater	Hub	Bridge	Router	Switch
Gilbran domain w/gh	C High	No. Collision inside Store and Forward	same Store and Forward.	Full Duplex used, C.D.O.
				Traffic is minimal.

### Bridge

Bridge  
maintains  
static or  
dynamic  
table

→ For Dynamic  
First time  
broadcasting  
is seen.

OSI → conceptual Framework that is designed to used to <sup>design the</sup> functions of networking services.

A.L → Human computer interface, where application can access the networking services.

Presentation → Ensure that data is in suitable format

Session → <sup>cannot</sup> maintain connection and is required



responsible to control the point and session.

Transport layer  $\rightarrow$  Transmits ~~raw~~ data and on  
transmission protocol like  
TCP and UDP

N.L  $\rightarrow$  Define the physical path data can follow

D.L  $\rightarrow$  Define the format of data on the network.

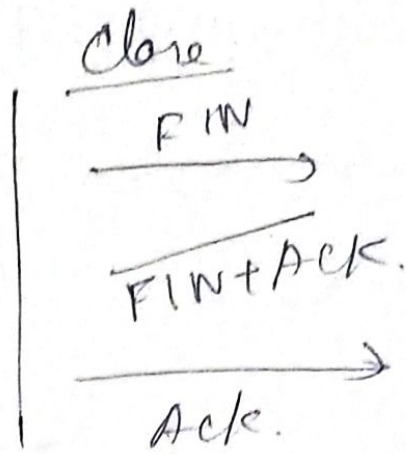
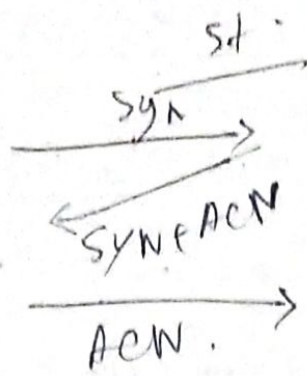
Phys L  $\rightarrow$  Transmits raw bit stream over  
the physical medium.

TCP  $\rightarrow$  Transmission control protocol that  
is used on top of IP to ensure the reliability  
of packets. ~~Tcp used on the TCP deals~~  
with the problems ~~on the~~ generated by packets  
like, lost packet, duplicate packet, corrupted  
packet.

TCP is used top of IP, thus ISP  
is called TCP/IP

TCP segment ~~segment~~ 2 parts TCP header  
and data . . . 20-60 bytes.

TCP header Source P, Destination IP,  
Ack no., Header length, Reserved, Flags, Window size,  
Checksum, Urgent pointer, Options, ~~padding~~ Data



UDP → UDP doesn't ensure reliability.  
UDP is connectionless.

UDP permits packet to be dropped rather than delayed packets.

UDP ensure loss tolerant by collection.

UDP header

8 bytes.  
S. 16 D. 16  
Length 16 Check 16.

Unicast →

one to one  
collection.

Broadcast →

omitted → more

Directed → own domain

and then domain.

Multicast → specific group

msg fragmented. all systems will get msg

# Class-A



~~20~~ ~~20~~ ~~20~~ ~~No of~~

$2^{31} \rightarrow$  No of IP addresses

$2^2 - 2 \rightarrow$  No of networks

No of host  $\rightarrow 2^{24} - 2$

D. mask  $\rightarrow$

255. ~~255~~ 0. 0. 0

0-127 ✓

## Class-B

10

$2^{30} \rightarrow$  No of IP address

$\frac{16-2}{2} \rightarrow$  No of networks

No of host  $\rightarrow 2^{16} - 2$  ✓

## Class C

$\frac{24}{8}$   
Networks host

No of IP  $\rightarrow 2^{24}$

$\frac{24-3}{2} \Rightarrow 2 \rightarrow$  No of networks

$\frac{8}{2} - 2$



Class-D →

$$2^{32-4} = 2^{28} \rightarrow \text{No. of networks.}$$

Class-B → Military purposes.

Class-D → Group mail.

Classless Addressing → addresses contiguous in nature.

200.10.20.40/28

11111111.11111111.11111111.11110000  
→ mask.

200.10.20.40/28.

200.10.20. ~~40~~ 60101000  
786th fixed 0000

200.10.32/28 → Network ID.

RSA

$P, q$

$P \times q$

$n = P \times q$

$\phi(n)$

$$= (P-1) \times (q-1)$$

$$1 < e < \phi(n)$$

$$\gcd(e, \phi(n)) = 1$$

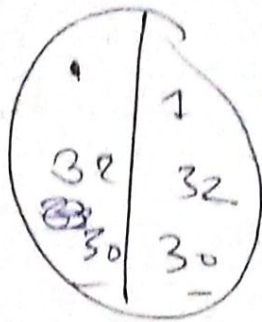
$$d = \frac{1}{e \mod \phi(n)}$$

Public key

$e, n$

Private key

$d$ .



195.16.20.10 00000001

128  
31  
159

http  $\Rightarrow$  port no 80 &  
inband protocols  
stateless

HTTP 1.0 Non persistent  
persistent.

FTP

21, 20

Control Data

Persistent Non persistent  
No inband.

Stateful.

MIME  $\Rightarrow$   
Multipurpose internet mail  
extension.

Cryptography

$M$   
text  $\rightarrow$  Encryption  $\rightarrow$   
Ciphertext  
 $M'$  text  $\rightarrow$   
Decryption

$M$  Text  
Symmetric  
 $E[K[M]] \rightarrow$  Key  
 $\rightarrow$  enc  
D.

Asymmetric  $\rightarrow$   
Receiver  
(Public key).  
 $\rightarrow$  2M. RSP.

SMTP and POP are both  
syn and asynchronous.

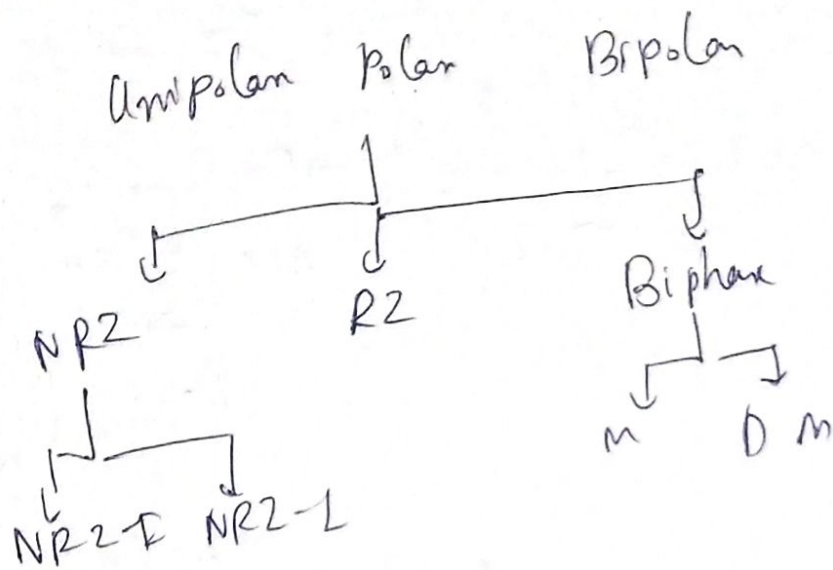
SMTP  $\rightarrow$  Port no

25

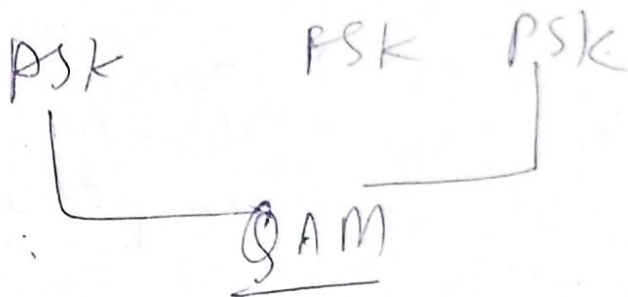
POP 3-3  $\rightarrow$  110

995  $\rightarrow$

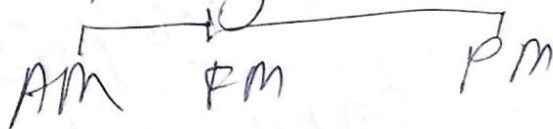
Digital  $\rightarrow$  Digital



Digital  $\rightarrow$  Analogue



## Analog To Analog



Analogy to Dryad.

Analogue  $\rightarrow$  sampling  $\rightarrow$  Quantisation  
 or  $\downarrow$   $\leftarrow$  Binary encoding  
 Digital/Digitized.