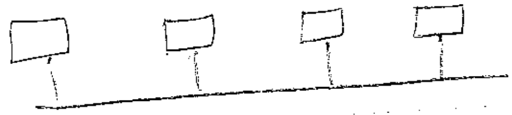
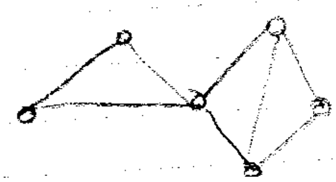


I Broadcast Links:
A single communication is shared by all machines on the Network. Short messages called packets are sent by any machine and are received by all others (called multicast if subset of all others). An address on the packet says who it was intended for.

Point to Point Links:
These consist of many connections between pairs of machines. A packet might have to traverse several edges to get from its source to target

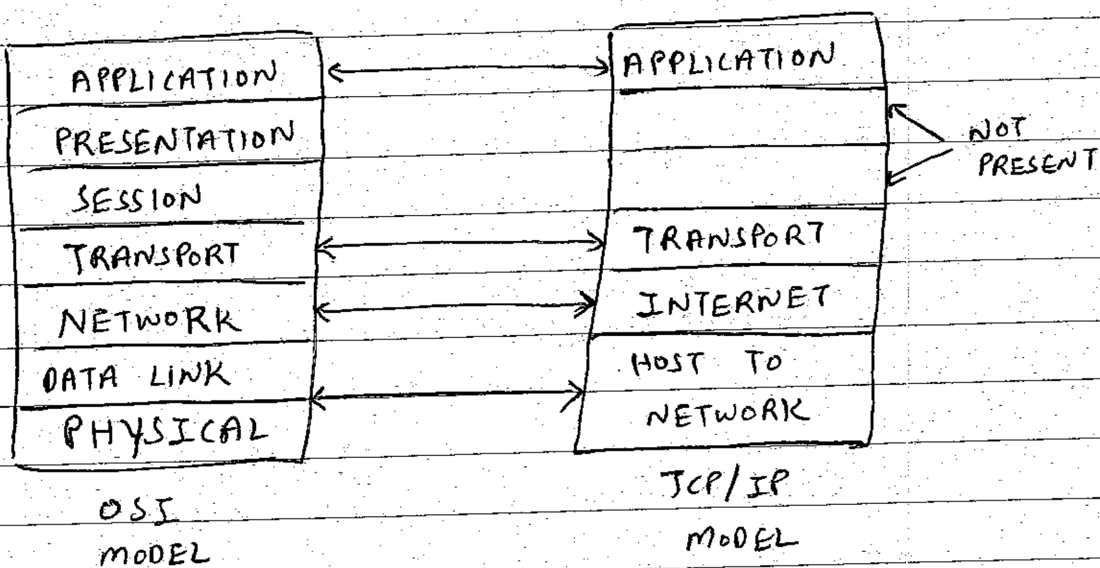


II Static - typically divide time into discrete intervals and use round-robin algorithm allowing each machine only to broadcast when its time slot comes up

Dynamic
Centralized - Allocation is a single bus arbitration decides who gets to go next.

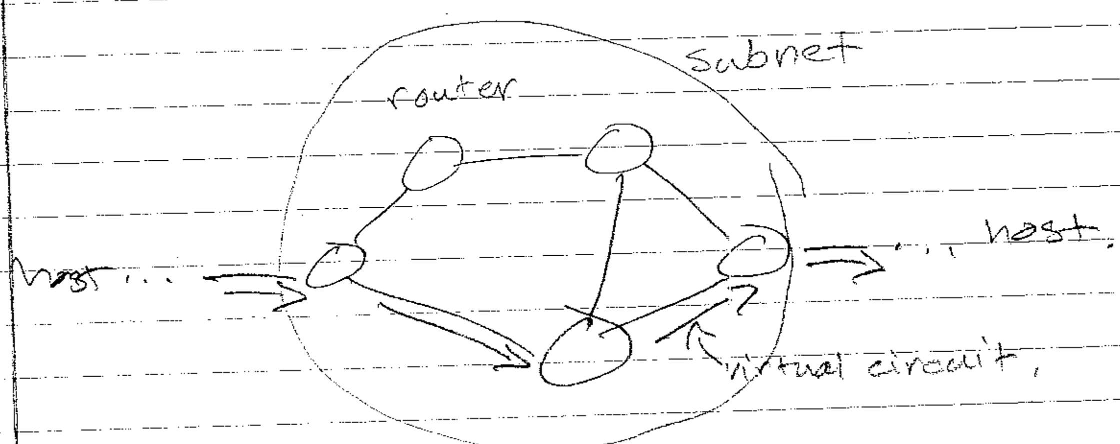
decentralized: Each machine must decide whether or not to transmit

3


APPLICATION
PRESENTATION
SESSION
TRANSPORT
NETWORK
DATA LINK
PHYSICAL
OSI
MODEL
APPLICATION
NOT
PRESENT
TRANSPORT
INTERNET
HOST TO
NETWORK
TCP/IP
MODEL

cell
5 byte header } Frame.
48 byte data

1) sends first cell to est. connection, id
2) each router est a ~~tra~~ cell map upon first cell sent
3) creates a virtual circuit.



Notes.
- no sequencing needed.
- 4 layer 3D reference model

(5)

According to Nyqust theorem, a noiceless channel with a bandwidth of H can traansmit a maximum data rate of

$$2H \log_2 V$$

Where V is discrete levels

Given

Bandwidth (H) = 5 000 HZ

Discrete levels (V) = 128

$\rightarrow 2 \cdot 5000 \log_2 128$

$= 10,000 \log_2 2^7$

$= 70,000$ Bits/sec.

5. bandwidth = 5 KHz
up to 128 discrete levels

$2^5 = 32$
$2^6 = 64$
$2^7 = 128$

max data rate $= 2H \log_2 V$
$= 2(5000) \log_2 (128)$
$= (10\ 000)(7)$
$= 70$ Kbps

6. An active repeater in a fiber network consists of an optical receiver, some copper wires, a signal regenerator, and an optical transmitter. The light from a optical fiber is converted into an electrical signal by the optical receiver, then transmitted through a copper wire to an electrical signal regenerator, where it is regenerated to full strength & resent through copper to a optimal transmitter out the other way.

(17) Frequency Division MultiPlexing:

Frequencies of different channels are translated by different amounts to put them all on the same line.

Time Division MultiPlexing

In this scheme, each user ~~takes~~ turns (Round-Robin), each one getting bandwith for a small Period of time.

Wavelength Division: Multiplexing

Input signals at different wavelengths are linearly added together by a combiner. At other end, split out by a splitter.

Name: Anand Sivaramakrishnan

Q8) A's chip sequence: 01010101
B's chip sequence: 11110000

Bipolar Chip Sequence for:

A = −1 +1 −1 +1 −1 +1 −1 +1
B = +1 +1 +1 +1 −1 −1 −1 −1

A wants to send a '1' and
B wants to send a '0'

∴ A will send its original sequence &
B will send its inverted sequence.

∴ for A:	−1	+1	−1	+1	−1	+1	−1	+1
for B	−1	−1	−1	−1	+1	+1	+1	+1
Addition	−2	0	−2	0	0	2	0	2

Signal to be transmitted.

At reciever,
To decode A, multiply the signal recieved with the bipolar chip sequence of 'A'

$(-2\ 0\ -2\ 0\ 0\ 2\ 0\ 2)(-1\ +1\ -1\ +1\ -1\ +1\ -1\ +1)$

$= (2\ 0\ 2\ 0\ 0\ 2\ 0\ 2)$

$= 8$, and then divide by 8

$8/8 = 1$ // recieved for A

9)

11 bit Hamming

1 1 1 1 1 1 1

1	2	3	4	5	6	7	8	9	10	11
1	1	1	1	1	1	1	1	1	1	1

3 = 0011

5 = 0101

6 = 0110

7 = 0111

9 = 1001

10 = 1010

11 = 1011

count: 3 3 5 5

$(2^3\ 2^2\ 2^1\ 2^0)$

0011
0111
1001
1111

error ↓

1 1 1 0 1 1 1 1 1 1 1

position 4 is parity bit which should be 1

so follow

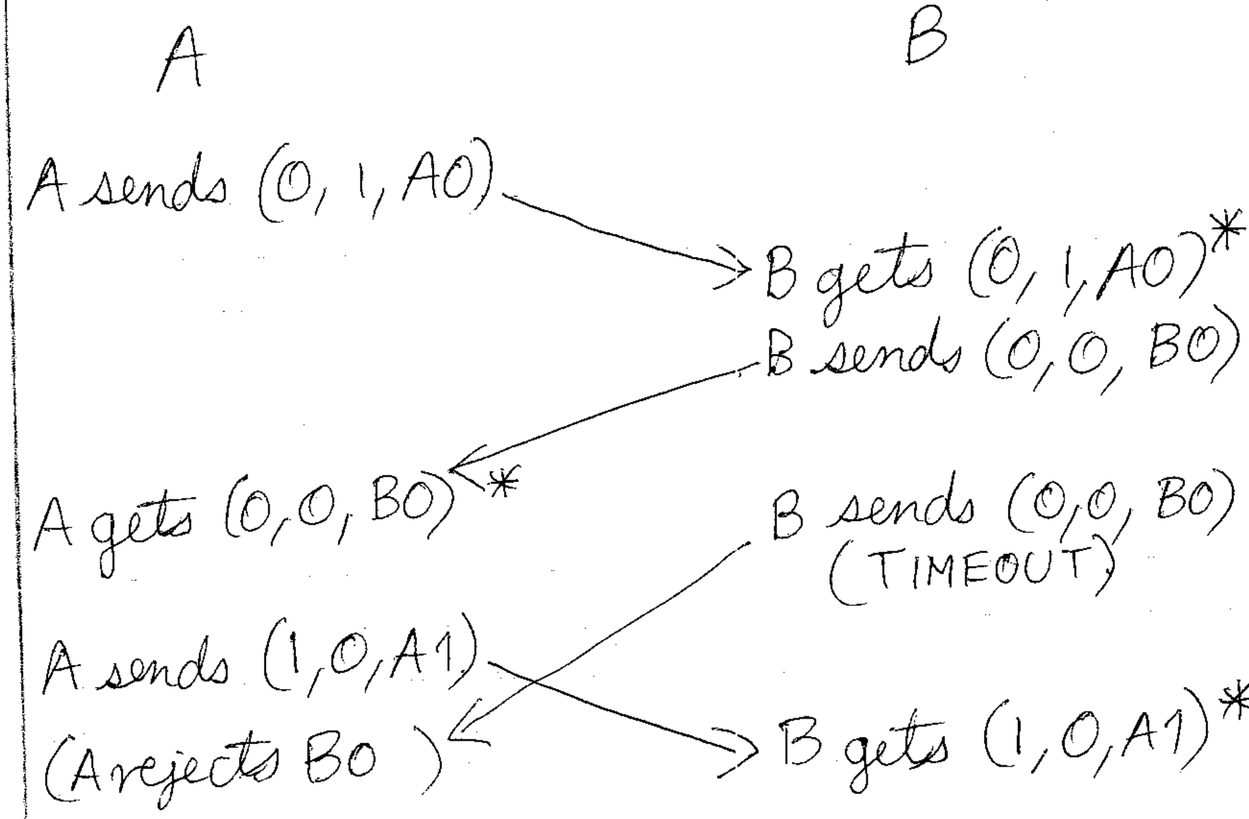
position 4 should be 1

	2^3	2^2	2^1	2^0
parity calculated from data bits	1	1	1	1
parity in codeword	1	0	1	1

0 1 0 0 ⇒ 4 ⇒ position 4 is incorrect.

different — correct

10



- Machine A is slower than Machine B
So, $delay_A > timeout_B$