9/1/23 Comp Network Lab

Addressing → read in network

- MAC - medium access control address → Physical
  - hardware
  - local basis of address assignment
  - Network Interface card (NIC)
    - → address is imprinted.
  - 48 bits → 12 hexadecimal digits
- Logical → universal form of addressing

address conflict

2 computers w/ same address tries to connect

Logical

- assigned by software (Internet protocol)
- most common/prevalent form : IP Address
  - ⇓ ~~only~~ to identify a host unambiguously

IP addressing (ver 4) IP_{v4}

32 bits.

Binary notation 11010010 00101100 10000000 00001111

↓

Dotted decimal notation 123.45.97.25

classification of address (to ↓ complexity of searching an address)

leftmost group MSB

Addresses	Class	First bits	Range
	A	0 . . .	0 – 127
2^{30} address (25%)	B	1 0	128 – 191
2^{29} (12.5%)	C	1 1 0	192 – 223
2^{28} (6.25%)	D	1 1 1 0	224 – 239
2^{28} (6.25%)	E	1 1 1 1	240 – 255

A: 1 bit fixed ⇒ 2^{31} address

$\frac{2^{31}}{2^{32}} = 50\%$ ⇓ shared by B, C, D, E

IP Address

| Net Id | Host Id |

| 201.32.65 | .5 |

A
B
C } Host identification.

D → multicasting.

host id must have all 1.

All 1's ip address ⇒ Broadcast

All 0's ⇒ 0.0.0.0 this host on this network

| Net Id | Host Id |

A	1 byte	3 byte
B	2	2
C	3	1

∴ no of network in class A = $2^8 - 2$

↳ $2^8 - 2$ no of host for each 2^{24} networks.

Net Id portion of an IP address identifies the network to which host belongs

Special Addresses

① Lookback address ⟶ 127.0.0.1

↳ packet lookback into its own OS to perform some network diagnostic function.

- network operating systems – what are currently active protocols? current scenario of TCP/IP or what algo used to search for such info is called network diagnosis.
- prepare query put it in data portion of packet and put return address as 127.0.0.1.

② Directed broadcast addresses

Net Id	Host Id
Specific	All 1's

3 forms of msg delivery :-

(i) multicast – to a group of host / subset of host

(ii) unicast –

(iii) broadcast – to all host

Types

3) Limited Broadcast Address — All 1's

New computer cannot communicate w/ all computer as it requires server/router address, ip address of other comp. etc, its own ip address

- it creates packet with these query
  client address → All 1's
  this msg is forwarded from one computer to other to finally server.
- Server provides ip address ~~to~~, server ip address and hosts immediate neighbours ip address ~~and~~ → sends response
  ↓
  unicast
  specific info sent ~~provided~~ to specific ip address of host

Why limited?
- initiated by a host who has ltd knowledge about network
- being a broadcast it is limited to a particular network

→ the response packet for a request has an indicator like a 1 bit flag which turns 1 when it goes to host while for others it stays 0. In this way the host knows the packet is for the host

4) Network Masks / default Masks

Net Id | Host Id
All 1's | All 0's

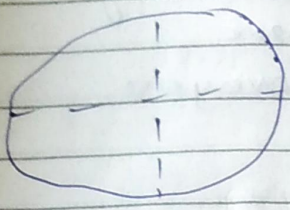
A	255.0.0.0
B	255.255.0.0
C	255.255.255.0

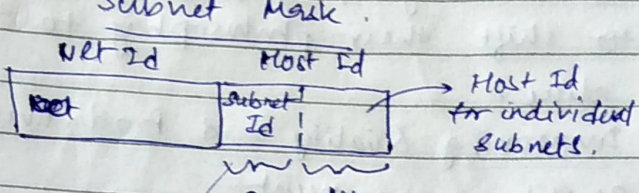
Bit wise And
↓
network address

∴ we can hide host id from network id portion.

for 1 class of address only a single mask address available using default mask we can identify from where the packet is arriving

Subnetting - no physical distinction or seperation of the network





2^{14}

255.255.192.0

network ⇒ 1.

Id → 00, 01, 10, 11 } all 1's.

default mask → entire networks, net Id : all 1's, Host Id : all 0's

subnet mask → We get network address

↓

applicable for sub networks, Net Id + Subnet Id : all 1's, Host Id : all 0's

if we perform bitwise and we get subnet address.

Subnet mask → bitwise → 1st subnet host address.

1. Responding to Globalization
   - Organisational behaviour addresses how cultural differences might require managers to modify their practices.
3. Managing workforce diversity
   The organisation should be more accommodating to diverse group of people. Managers have to shift their philosophy to treat everyone alike.
3. Improving Quality and Productivity
   Quality management
   process reengineering
   follow to bring about any change
   OB gives an insight to managers to effectively carry out those changes
4. Responding to labour shortage.

   OB ~~help~~ helps managers create policies and benefits that can deal w/ labour shortages.

5. Improving customer service

   OB contributes in a way that ~~shows~~ shows managers how employees' attitudes & behaviours are associated w/ customer satisfaction.

6. Improve people skill

   Designing motivating jobs, techniques for improving listening skills & & creating effective teams

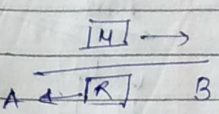
7. Empowering people.

Putting employees in charge of what they do. Managers are learning how to give up control and employees are learning how to take responsibility and make appropriate decisions.

~~Why data mining?~~

Network criteria

Performance
- transit time
- response time
- throughput.



A msg requires 'T' sec from src to dest. The msg is in transit. This is known as transit time.

Response time is the

Respone time lower performance better.

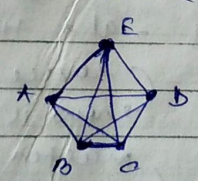
→ Amt of data transmitted through some reference pt. in a network per unit time ⇒ throughput.

router/gateway → reference point.

Topology

physical str of the network

1) Mesh
2) Star
3) Bus
4) Ring
5) Hybrid



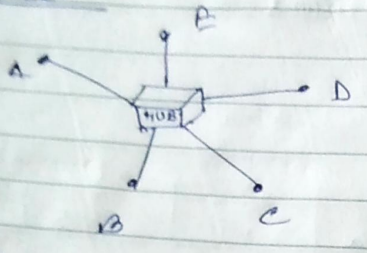
mesh

→ connectivity b/w every two nodes.

adv:-
- all connections dedicated thus transmission speed is fastest, error rate is minimum.
- most robust, if connection b/w any 2 form other connections not effected.

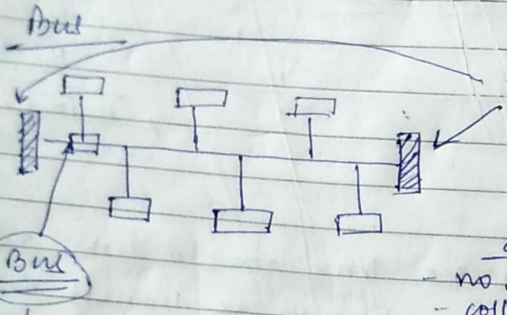
disadv:-
- Its installation cost is highest & least popular.

Star



- HUB provides end to end connectivity.
- via connectivity not dedicated
- less cost for installation

Bus

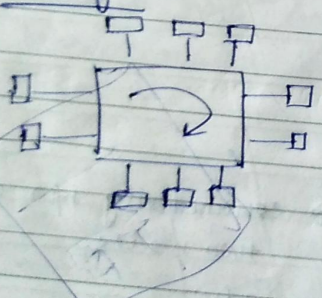


disadv:-
- no data security.
- collision (if error) → data irretrievably gone.

Bit unification system
⇓
implements serial mode of communication

adv
regarded as most popular topology of all computers. min^m installation cost (as cabling is min^m)

Ring.



- always unidirectional
- closed
- controlling mechanism monitor
- at a time only one device transmits
  → how is it guaranteed?
  master station.
  → Special bit ⇒ token