

Computer Networks

CN mean

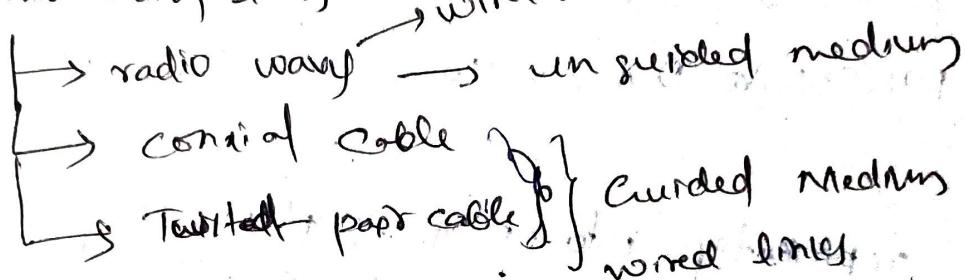
- * A group of devices connected by communication links.

Such as : computer, server, printer, router, mobile

⇒ In CN term we call them as nodes.

node: any type device which can receive data & send data.

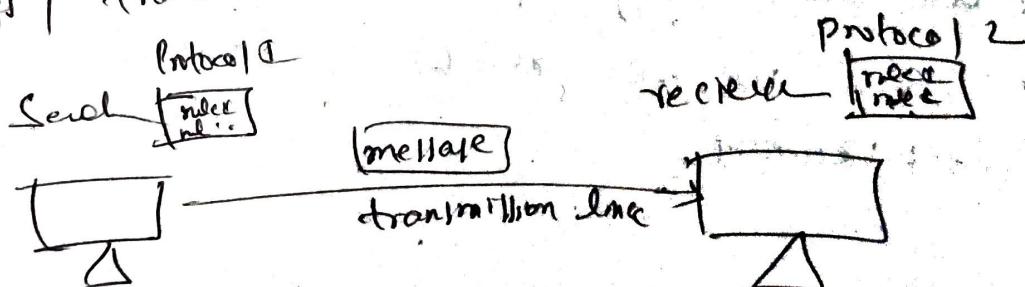
⇒ communication links Only



Basic Building of CNs

- * nodes
- * links

- * we connect two devices using communication channels / transmission links.



messages are audio, video, pdf etc. \rightarrow pixel converting.
text, numbers, maps \rightarrow converts from binary to decimal
 $nn \rightarrow nn$

Components of CN

1. sender
2. receiver
3. message
4. transmission link
5. protocol

↓
is a set of rules, present in sender & receiver

* OSI Model (open system interconnection)

→ layers are present

Data communication

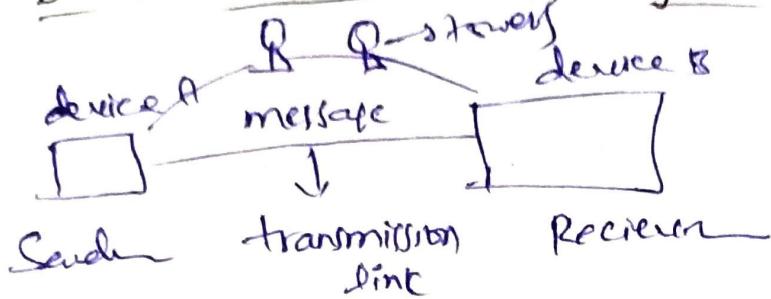
sharing of data
local (face to face)
remote

⇒ sharing data b/w devices via transmission media (OS) communication links.

Characteristics of DCT

- 1) Delivery (Delivery data to dest destruction) (A DCE)
- 2) Accuracy
- 3) Timeline (System must deliver data in time manner)
- 4) Jitter (the term refers to the variations of packet arrival time)

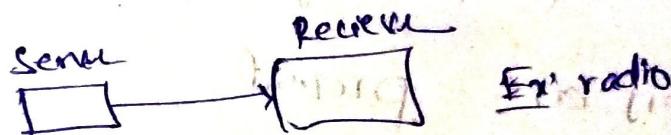
Data communication system



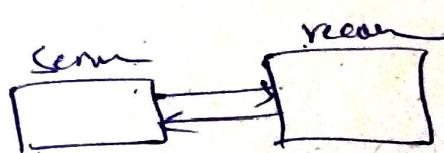
- It sends information through tower
- Send & receiver are End node
- towers are intermediate nodes.

Data flow

1. Simplex mode



2. Half-duplex



Both side flow possible
but not taking at a time one after another

Ex wall-e-talk

3. Full-duplex

at a time both flows can be possible

server receiver



Ex phone

Networks

A group of devices connected by communication link.

Network criteria

- * network criteria must able to meet no. of criteria
 - 1. performance
 - 2. Reliability
 - 3. security

1) performance of network can be measured in diff ways. They are:

- i) Transit time (amount of time to trans. the data node A to node B)
- ii) response time (entire path respond and the response time)
- iii) throughput (the amount of data moves successfully from one node to another node)
- iv) delay [amount of delay time]

2) Reliability

- data transfer b/w nodes without any failure.
- * If failure occurs b/w over connn from data can be transferred called as reliability.
- * In addition to accuracy of delivery network reliability is measured by frequency of failures.

3) Security

- * protecting accelling data from unauthorized access.

Types of network

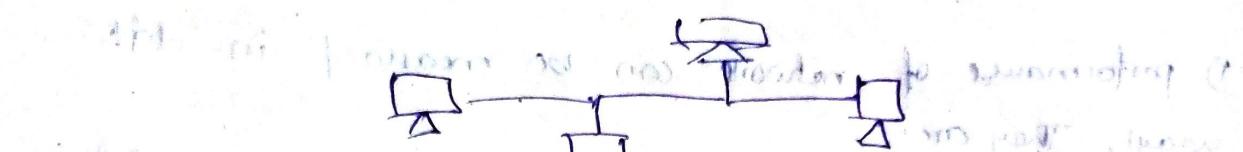
1. point to point connection
2. Multipoint connection

1) one device to one device connection is possible

→ It contains only two devices



- 2). It can connect using multiple connections
- Any no. of devices are possible



1. provide dedicated link b/w two devices

2. also called as multidrop

→ The connection is one from which more than two specific devices share a single link.

Network hardware

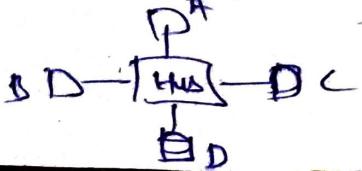
1. Hub
2. switch
3. Router
4. Bridge
5. Gateway
6. Repeater

Hardware device two types

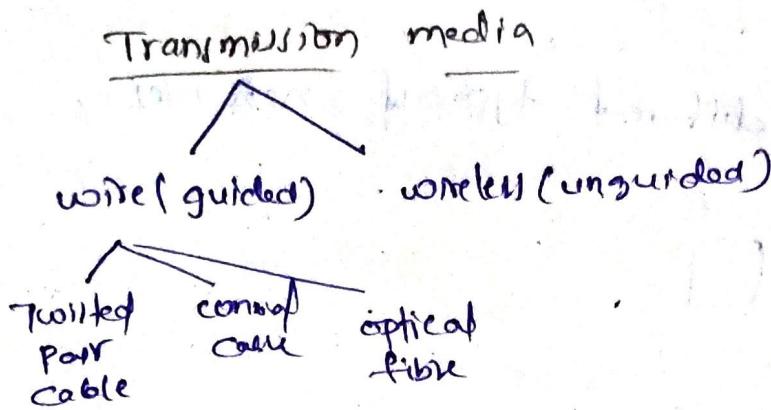
passive device active device

1. Hub is a broadcast device sends information in all direction.

Hub is passive device



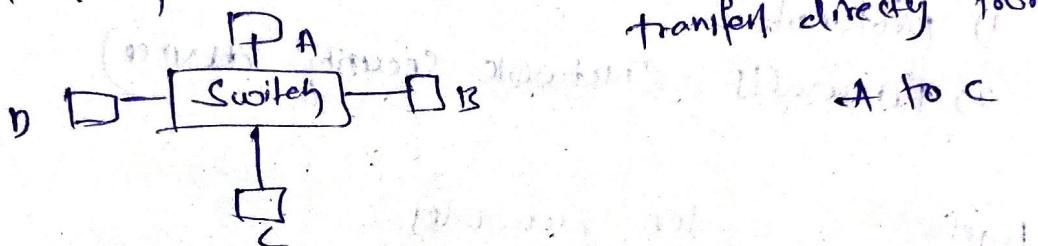
Transmission media



→ Switch

It carries data in unidirection (i.e. specified direction)

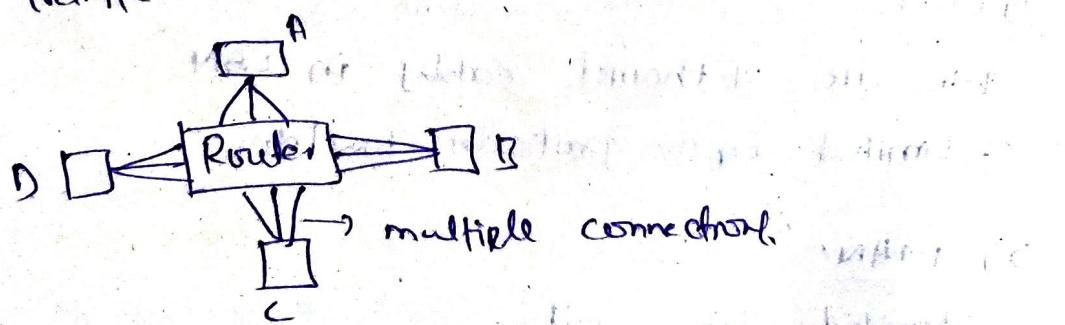
- * It is an active device



entire is called network

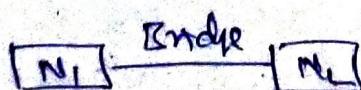
3) Router

multiple connection will occurs b/w devices Router, from that in efficient way only data can be transferred.



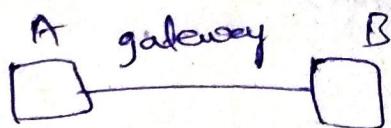
4) Bridge

It connects two same type of networks



5) Gateway

It connects different types of networks.



6) Repeater

It is used to extend network signals.

Network Software devices

- 1) protocols
- 2) firewalls (Network security device)

* Types of computer Networks

1) LAN LOCAL AREA NETWORK

2) MAN METROPOLITAN AREA NETWORK

3) WAN WIDE AREA NETWORK

1) LAN:

We use Ethernet cables in LAN

* Limited upto particular building.

2) MAN:

Limited upto city.

Ex: Telephone, DSL (Digital Subscriber Line)

* Optical fibre cable.

3) WAN:

* In wide range

Ex: Internet

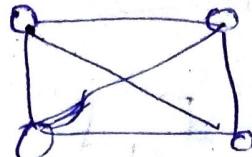
* Topology:

* structure of network

* networks can be connected in

star, bus, ring, mesh, hybrid

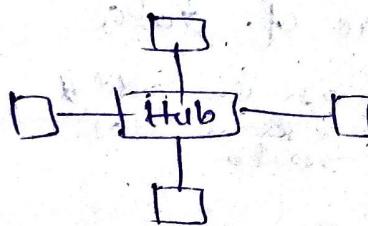
mesh topology



⇒ For n no. of nodes $\frac{n(n-1)}{2}$ links are possible

Star topology:

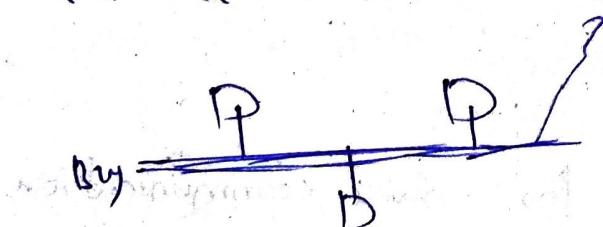
* we can use hub or switch in star topology.



⇒ For n -node n links are possible

Bus topology

* we use Ethernet cables, coaxial cables



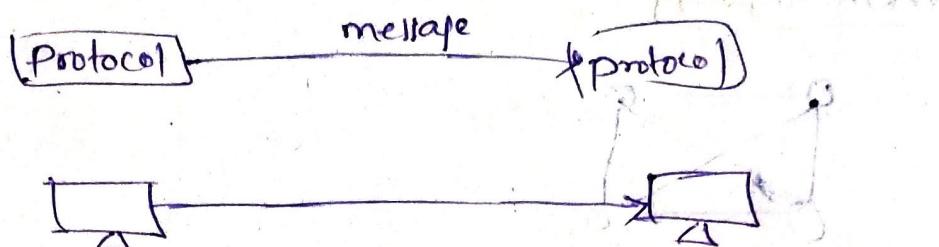
⇒ costlier to compare to mesh

⇒ mostly collisions will occur in bus topology

⇒ collision: Interference of data.

Protocol: Network Software

- * set of rules that governs data communication.
- * without protocols msg transform action will not possible.

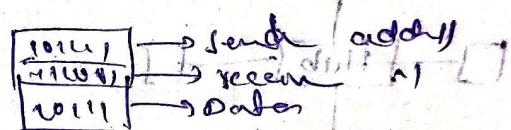


Adding no sender (host) & return for receiver

* Key elements of protocols

1) Content 2) Semantic 3) Timing

1) Content refers to structure of data.



2) Semantic refers to each section of bits.

3) Timing: when data sent & how much send, how fast it send.

Standards

- * it is a set of rules for data communication that are needed for exchange of information among devices.

Data communication standards are two types:

- 1) De facto (by facts or convention)
 - 2) De jure (by law or by regulation)
- ↓ IEEE, ANSI, ISO