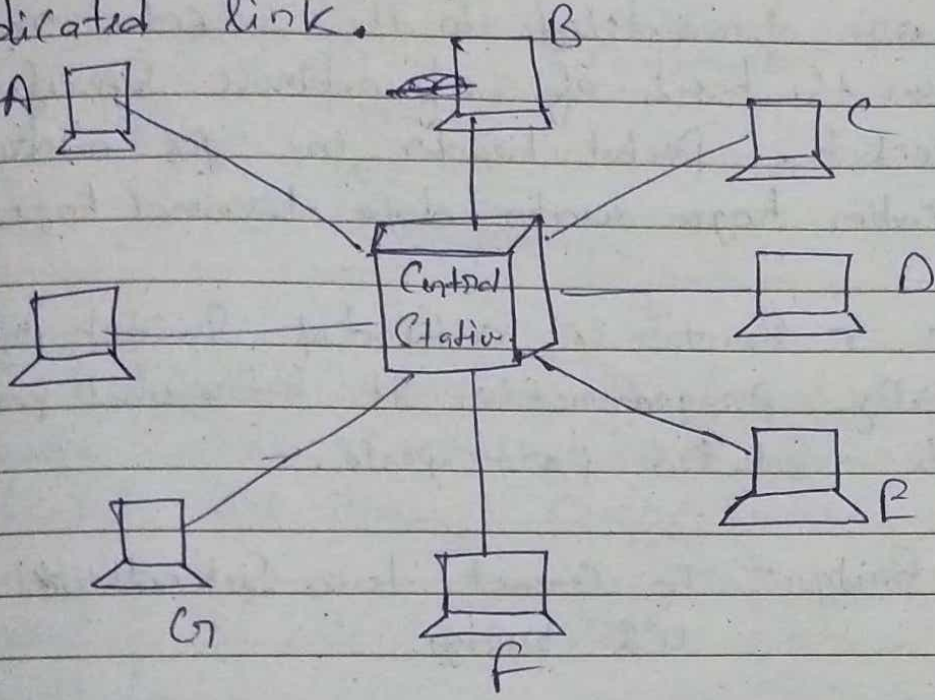
Star topology.

Implemented in labs, cyber cafes

In Star topology there exist a Central Control as Central Station. Physically it is kept in Center, is not necessary. According to Connectivity it's position is in Center. After that all the participating machine are Connected to Central Station via dedicated link.



If A wants to send data to F, it will first send data to Central Station. C.S will observe the message. it will further conclude the address of the receiver, if the receiver is in available position, Data is sent to receiver.

In place of Central Station can use network Switch. Three type of implementation is possible.
(i) HUB (ii) Switch (iii) Router.

(i) HUB :- When Hub is used as the Central Station of Star topology, then anything received

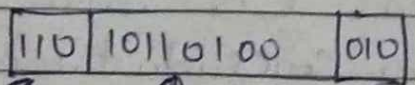
inside the HUB will be broadcasting to all the participating Entity Equally. So. It is mostly not used.

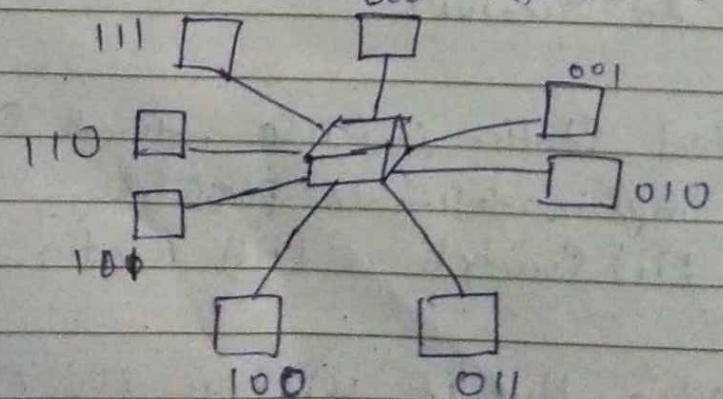
(ii) Switch ÷ It is such kind of connecting logic when Switch is used as Central Station of Star topology packets which are received inside the Switch are transmitted to the selected machine only on the basis of of address Specified onto the packet. Packet header me jis address ka Specification hoga waha data transmit hoga.

(iii) Router ÷ Router is a kind of Switch by dynamically programmable. It transmit packets only to Sliected participants.

* Bridge ÷ To Connect two Subnetworks we use bridge.

* Packets ÷ Logical arrangements of bits.





if we have ÷
3 bits then address 8 machine
4 bits then can address 16 machine.

If we are having n bits to specify the address we can uniquely identify $2^n - 1$ addresses here. '000' is not used for addressing instead it is used for broadcasting.

3 bits the no. of possible combinations

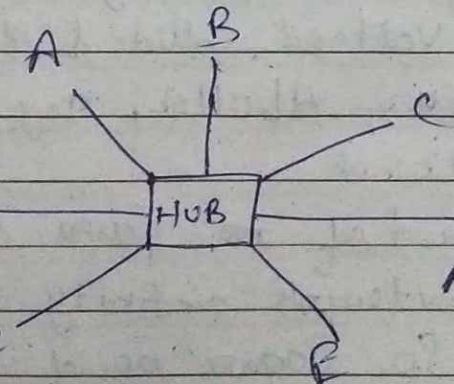
000
001
010
011
100
101
110
111

} 8 combinations

Merit : (i) In comparison to bus & Ring it is more secure. Each sender & receiver has their own dedicated link through Central Station

Demerit : if Central Station break, the Entire network will fail.

* Using Star topology we can implement specific type of network called ALOHA network.



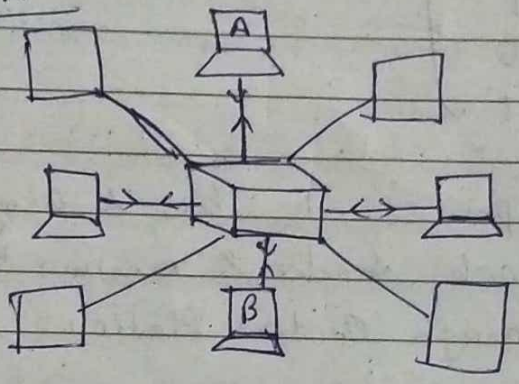
Suppose A wants to send data to G, then acc. to Star topology, A will send data to Central Station because of ~~Control~~ Cent HUB is used as Central Controller

Hub will broadcast the packet to all participating machines equally and A will also receive its own packet which will ensure machine 'A' that packet is delivered successfully. This is the working principle of ALOHA network. HUB is used as central controller in ALOHA network.

Two types of ALOHA network :-

(i) Pure ALOHA (ii) Slotted ALOHA.

(i) Pure ALOHA



Jab koi v sender data kisi sender ko bhejta hai. kisi bhi network activity ke initiate hote hi ; whole network get busy. So when no. of participants increases, So when A will send its data & at the same time when A is processing if any other sender sends the data then the voltages collide & data is corrupted. This is bcoz in pure ALOHA., any network activity busy the whole network.

The inherent demerit of pure aloha is any smallest form of network activity is capable to busy the network. So, agar no. of participants jyada honge to probability hai ki, Jab ek machine data send kar raha ho, during processing other machine agar data bhejta hai to ye intermingle hoke voltage collide

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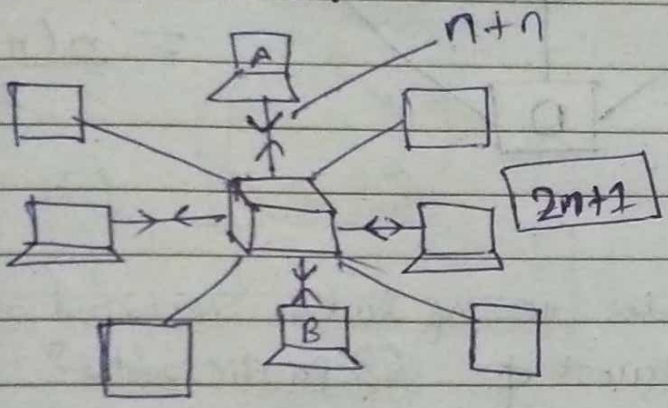
kar jayenge aur data corrupt ho jayega.
So, we overcome this demerit using Slotted ALOHA.

(ii) Slotted ALOHA : It says that because pure ALOHA network is very sensitive to data collision. So in Slotted ALOHA there is a rule implemented that each sender will be allocated with predefined time slot. And that sender will be allowed to send data in that time only. If another sender ~~says~~ tries to send data then that sender will be delayed till its time slot come.



Kbps (Kilo bits)
KBPS (Kilo Byte)

When we send data from 'A' to HUB (Central Station) Suppose it takes 'n' time and data broadcasted by HUB takes 'n' time and in addition we took '1' time unit (marginal time). So after (2n+1) transmission of A is completed.

Expression for Vulnerable time = 2n+1

Q) Drive the Expression for Vulnerable time ?