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(1)

Q My ID is , 18101018

$$\text{Here, } X = 8 + 1 = 9$$

$$Y = 1 + 1 = 2$$

In Mesh topology we have 9 computer ,  
and  $\frac{9(9-1)}{2} = 36$  links and  $9-1 = 8$  I/O  
ports.

On the other room the star topology have  
2 computer connected to a single hub  
with 2 links

If I were to choose, I would choose  
Mesh for a more secure network.  
the reason is given below:

In Mesh topology every node is connected  
with point-to-point link. so it is more  
robust and secure as fault in one node  
doesn't affect the whole network.

And in star topology every node is connected with a hub and the dependency of the whole network is on the hub. So - faulting in hub affects the whole network.

12 So that's why I would prefer mesh topology for a more secure network.

(b)  
The advantages of half duplex and full

(6)

The advantage of half-duplex and full-duplex data flow are given below:

⇒ Advantage:

\* Half-duplex:

Whole 1000bps ~~bandwidth~~ bandwidth can be utilize at a time.

5 \* Full-duplex:

can transmit and receive simultaneously.

⇒ Disadvantage:

\* Half-duplex:

can't transmit and receive at the same time.

\* Full-duplex:

Bandwidth must be divided between two direction.

②

~~My~~ My ID = 18101018

$$X = 8^2 \bmod 6 = 4$$

$$Y = (8^4 + 1) \bmod 6 = 5$$

So, I will be in PC4 and my friend will be in PC5

Here, Process 1 of PC4 = 6000

Process 2 of PC5 = 7000

Sender MAC	Receiver MAC	Sender IP	Receiver IP	Port of sender	Port of Receiver	Data	Trailer
MAC of E ✓	MAC of R40 ✓	IP of E ✓	IP of F ✓	6000 ✓	7000 ✓	Data	Trailer
X MAC of E	MAC of R40	IP of E	IP of F	6000	7000	Data	Trailer
MAC of R42 ✓	MAC of R52 ✓	IP of E	IP of F	6000	7000	Data	Trailer
X MAC of R42	MAC of R52	IP of E	IP of F	6000	7000	Data	Trailer

MAC of R50	MAC of F	IP of E	IP of F	6000	7000	Data	Trailer
MAC of R50	MAC of F	IP of E	IP of F	6000	7000	Data	-Trailer

PC 0, PC 1, PC 2, PC 3, ~~PC 4~~ not visited

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Error Control:

Like the data link layer, the transport layer is responsible for error control. However, error control at this layer is performed process-to-process rather than across a single link. The sending transport layer makes sure that the entire message arrives at the receiving transport layer without error. Error correction is usually achieved through retransmission.



flow control: Like the data link layer, the transport layer is responsible for flow control. However, flow control at this layer is performed end to end rather than across a single layer.



(4)

$$(a) \text{ My ID} = 18101018$$

$$X = 8+1 = 9$$

$$Y = 1+1 = 2$$

$$\text{Bandwidth} = 9 \text{ MHz}$$

$$= 9 \times 10^6 \text{ Hz}$$

$$\text{SNR} = 10 \times 2 = 20$$

~~Bit Rate =~~

$$C = B \log_2 (1 + \text{SNR})$$

$$= 9 \times 10^6 \text{ Hz} \times \log_2 (1 + 20)$$

$$= 9 \times 10^6 \text{ Hz} \times 4.392$$

$$= \cancel{39528000 \text{ bps}} = 40 \text{ Mbps}$$

Signal levels,

$$\cancel{39528000} = 2 \times$$

$$40 \text{ Mbps} = 2 \times 10 \text{ MHz} \times \log_2 L$$

8

⇒

$$L = 1$$

⑤

The main difference between bandwidth and throughput is bandwidth is theoretical and throughput is practical.

Bandwidth in hertz refers to the range of frequencies in a composite signal. ~~or the range of~~

And in bits per second, refers to the speed of bit transmission in a channel or link.

Throughput is the measurement of how fast we can actually send data through network.

\* No throughput cannot be greater than bandwidth, usually its smaller than bandwidth.