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MID - TERM EXAMINATION - 2020

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Subject : CSE 315 (Self study)

Semester : Spring 2020 Date : 25/08/2020

Dept. : CSE (Computer Science & Engineering)

Prativas

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Ans. to the Ques. No. 1 (a)

X computers are connected with mesh topology

Y computers are connected with star topology

My ID is 14101078.

$X = 8 + 1 = 9$

$Y = 7 + 1 = 8$

A mesh network with n nodes has $\frac{n(n-1)}{2}$ links.

$\therefore$ The mesh topology has

$= \frac{9(9-1)}{2} = 36$ links.

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A star network with n nodes has n link.

∴ The star topology has = 8 links.

For security purpose, I will choose the mesh topology. This network uses different connection for every point, so a failure in one node ~~network~~ does not effect the whole network. But failure in the hub can cause the whole network to fail in star topology.

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Ans. to the Qus. 1(b)

Here, let's discuss the two types of data flow.

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Half - duplex dataflow : The communication between sender and receiver occures in both directions in half duplex transmissi but only one at a time. The sender and receiver can both send and receive the information, but only one is allowed to do so at a time. Half - duplex is like a one - way road. In which, vehicles traveling in the opposite direction has to wait till the road gets empty.

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Example : Walkie - Talkie. They can't speak simultaneously.

Full-duplex : In the Full-duplex transmission mode, the communication between sender and receiver can occure simultaneously. The sender and receiver can both transmit and receive at the same time. Full-duplex transmission is like a two-way road, in which traffic can flow in both direction at the same time.

Example : Telephone. Both speak & listen at the same time

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Half - duplex :

Advantage :

① Data doesn't overwrite one another

Disadvantage :

① Provides less performance than full- duplex

Full- duplex :

Advantage :

① Better performance than half - duplex.

② Data can clash with one another

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Ans. to the Qus. No. 2(b)

Transport layer is the second layer of the TCP/IP model. It is an end-to-end layer used to deliver messages to a host. It is termed as an end-to-end layer because it provides a point-to-point connection rather than hop-to-hop between the source host to destination host to deliver the services reliably.

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Transport layer checks for errors in the messages coming from application layer by using error detection codes, computing checksums, it checks whether the received data is not corrupted and uses the ACK and NACK services to inform the sender if the data has arrived or not and checks for the integrity of the data.

The transport layer also provides a flow control ~~and~~ mechanism between the adjacent layers of the TCP/IP model. TCP also prevents data loss

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due to a fast sender and slow receiver by imposing some flow control techniques. It uses the method of sliding window protocol which is acomplished by the receiver by sending a window back to the sender informing the size of the data it can receive.

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The statement - " Like data link layer, Error control and flow control are also performed in transport layer in end-to-end rather than on single link " has been explained.

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Ans. to the Qus. No. 4(a)

Here, My ID is 14101078

$\therefore X = 8+1 = 9$

$Y = 7+1 = 8$

We have a channel with 9 MHz Bandwidth.

The SNR for this channel is

$10 \times 8 = 80$

bit rate = ?

Signal level = ?

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~~First we use the common Nyquist formula to find ~~ave~~ upper limit~~

$\cancel{B \log_2 (1+SNR)}$

$\cancel{9}$

~~Bit rate~~ $\cancel{= 2 \times 9 \times 10^6 \times \log_2 L}$

We can find the signal levels from Nyquist formula.

$2 \times 9 \times 10^6$ MHz $\times \log_2 L$ □ L

$\cancel{= 36 \times 10^6 \text{ Mbps}}$.

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and from Nyquist formula, over upper limit,

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$$C = 9 \times \log_2(1+80)$$

$$= 57.06 \text{ Mbps.}$$

Ans. to the Qus. No. 4(b)

Bandwidth vs. Throughput :

On the surface Bandwidth and Throughput can appear to be similar but they couldn't be further apart from one another. The most common analogy to use

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to describe the relationship between the two is to consider bandwidth as a pipe and throughput as water. The larger the bandwidth is, the more throughput can flow through it.

Within a network, this means that the amount of Bandwidth determines how much packets can be sent and received between devices at one time and the amount of throughput tells us how many packets are getting transmitted.

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Although, Throughput is better term to measure network performance, this doesn't mean that bandwidth doesn't have any influence on the performance.

Yes, throughput can be greater than bandwith. Data will only take more time to transfer.

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