**King Saud University**

**College Of Computer & Information Sciences**

**Department Of Computer Sciences**

**Tutorial 1 Fall 15**

**(Computer Networks CSC 329)**

1. **Explain the functions of the three first layers of the OSI model ( Physical layer , Data link layer , Network layer ).**

Physical layer : is responsible for movement of individual bits from one hop( node ) to the next.

Data link: is responsible for movement frames from hop( node ) to the next .

Network layer : is responsible for delivery of the individual packet from source to host to the destination host .

1. **How many layers are defined in TCP/IP model? List them from top to bottom.**

**Ans: 4 layers:**

Application

TCP ( transport)

IP(network)

Ethernet ( physical and data link).

1. **Discuss the advantages and the disadvantage of the Bus topology and the ring topology.**

Ans:

Bus Topology :

while bus topology is relatively inexpensive, and easy to implement and extend, there are some drawbacks. Heavy traffic can significantly slow the network and performance is effected when more computers are added.

There is a limited number of stations, and break in the main cable, or back bone, can disable the entire network. Since

Since every computer can “ see” the data , there may be issues with security.

**Ring Topology:**

1. **What is the difference between end-to-end delay and packet jitter? What are the causes of packet jitter?**

**Ans:**

End to end delay is time it takes a packet to travel across the network from source to destination.

Delay jitter : is variation in packet transit delay, caused by queuing , contention and serialization effects on the path through the network.

1. **Suppose you are using a PC at home, which is connected to the Internet using a modem over a telephone communication link. The modem can transfer data at a maximum rate of 28,800 bits/sec. How long would it take to download a file (which is 1000000 bytes long) from a server your PC is connected to.**

**Ans:**

Time = amount of data/ transfer rate = ( 1000000 \* 8 bits) / 28800 bps = 278 seconds = 4.63 mints

1. **Suppose that the answer to (a) is X seconds and you transferred the same sized files numerous times. You find that the actual time to transfer always takes longer than X seconds. Give a plausible explanation for this.**

**Ans:**

Bit errors can occur on communication links

Retransmission of damaged frames must occur and thus it takes longer than the theoretical transmission time.

**Consider sending a file of (F=M\*X bits) from A to D over the network below, consisting of four nodes and three links ( figure 1).**

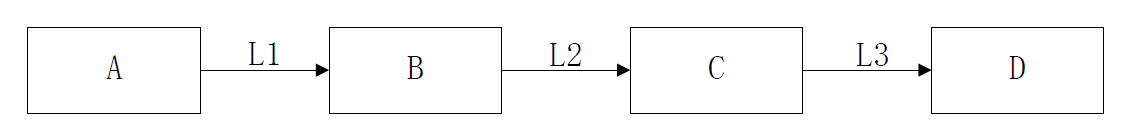


Figure1.

**We assume that the network is a packet-switched network and that the file is split into M packets each of size X. Each packet is then given additional h bits of header.**

**Each entity (A, B, C and D ) transmits data through the physical media at R bps .**

1. **Assume that propagation delay on the links is negligible. How much time does it take from when the first bit of the file leaves A to when the last bit arrives at D? Explain your answer.**

A -> B = ( X + h) / R

B- > C = ( X + h) / R

C – > D = (X + h ) / R

ALL =