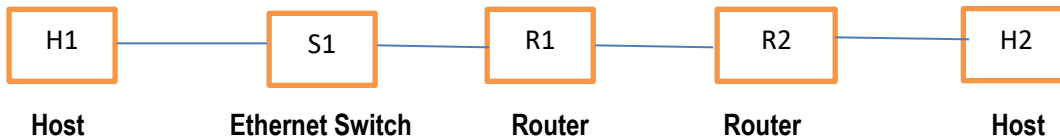


Course Code: CS307	Course Name: Computer Networks
Instructors: Mr. Shoaib Raza	
Student Roll No:	Section:

Time Allowed: 25 minutes.

Maximum Points: 25 points

Question #1: Highlight the correct layers traversed by a packet from H1 to H2 in a connection in the following setting H1, H2 represent host, S1 represent Ethernet switch and R1, R2 are Routers.



Application	Application	Application	Application	Application
Transport	Transport	Transport	Transport	Transport
Network	Network	Network	Network	Network
Data link	Data link	Data link	Data link	Data link
Physical	Physical	Physical	Physical	Physical

Question #2: Write the full form of:

IETF	Internet Engineering Task Force
ARP	Address Resolution Protocol
IMAP	Internet Mail Access Protocol
DNS	Domain Name System
OSI	Open System Interconnected

Question #3: Suppose Host A wants to send a large file to Host B. The path from Host A to Host B has three links, of rates R1 = 500 kbps, R2 = 100 kbps, and R3 = 1 Mbps.

a) Assuming no other traffic in the network, what is the throughput for the file transfer?

Answer:

Throughput = Min (500kbps, 100kbps, 1000kbps) =100 kbps

b. Suppose the file is 2 million bytes. Dividing the file size by the throughput, roughly how long will it take to transfer the file to Host B?

Answer:

$[(2 \times 10^6) \times 8] / (100 \times 10^3) = 160$ seconds or 2.66 minutes.

Question #4: How long does it take a packet of length 64Kbytes to propagate over a link of distance 3,500 km, propagation speed 2.8×10^8 m/s, and transmission rate 22.5 Mbps? Recalculate for distance=800m.

Answer:

Propagation delay = $d/s = (3500 \times 10^3 / 2.8 \times 10^8) = 12.5$ msec and

Propagation delay = $d/s = (800 / 2.8 \times 10^8) = 2.86$ usec

Question #5:

Calculate the LAN and Access link utilization in following scenario shown in figure#1.

- a. Average object size is 500 Kilo Bytes.
- b. Average request rate from the browsers to origin server is 20 requests/seconds.
- c. Cache Hit ratio is 0.33.

Answer:

Average Requests/Sec = 20

Avg Size = $500 \text{ KB} \times 8 = 4000 \text{ Kbits} = 4 \text{ Mbits}$

Total load = $(4.0 \times 20) = 80 \text{ Mbits/sec}$

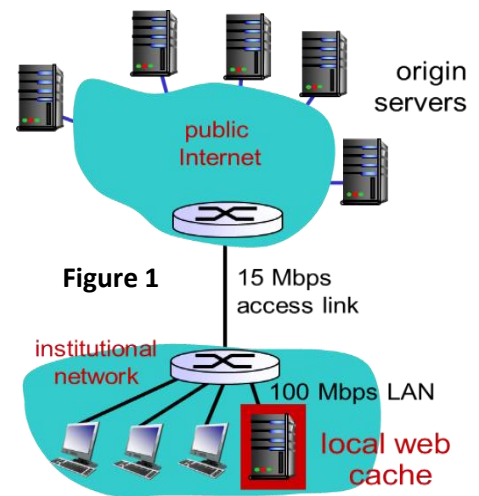
LAN Utilization = 80 %

Data rate to browsers over access link = $(0.33 \times 80) = 26.4 \text{ Mbits}$

Cache hit ratio = 0.33 which would put load of 26.4 Mbits/sec to access link

Access link utilization = $26.4/15 = 1.76$

So it will be 176% utilized and packets will drop due to queuing.



AA



National University of Computer & Emerging Sciences, Karachi
Spring 2021, Department of Computer Science
Class Participation Written- I
12th March 2021



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Encircle the most suitable option.

1. Your company has a LAN in its downtown office and has now set up a LAN in the manufacturing plant in the suburbs. To enable everyone to share data and resources between the two LANs, what type of device(s) are needed to connect them? Choose the most correct answer.
a) Modem b) Cable c) Hub **d) Router**
2. The term 'duplex' refers to the ability of the data receiving stations to echo back a confirming message to the sender. In full duplex data transmission, both the sender and the receiver.
a) cannot talk at once **b) can receive and send data simultaneously**
c) can send or receive data one at a time d) can do one way data transmission only
3. When you ping the loopback address, a packet is sent where?
a) On the network **b) Down through the layers of the IP architecture and then up the layers again**
c) Across the wire d) through the loopback dongle
4. Which of the following TCP/IP protocol is used for transferring electronic mail messages from one machine to another?
a) FTP b) SNMP **c) SMTP** d) RPC
5. A distributed network configuration in which all data/information pass through a central computer is
a) bus network **b) star network** c) ring network d) Point-to-point network
6. How many bits internet address is assigned to each host on a TCP/IP internet which is used in all communications with the host?
a) 16 bits **b) 32 bits** c) 48 bits d) 64 bits
7. Which of the following is required to communicate between two computers?
a) Communications software b) protocol c) communications hardware **d) All of the above**
8. The packet of information at the application layer is called:
a) Packet **b) Message** c) Segment d) Frame
9. The DNS Record type which is used for Mail Servers records is:
a) NS Record b) MS Record c) Mail Record **d) MX Record**
10. Transport layer aggregates data from different applications into a single stream before passing it to
a) network layer b) data link layer c) application layer d) physical layer
11. Which one of the following is a transport layer protocol used in networking?
a) TCP b) UDP **c) Both TCP and UDP** d) None of the mentioned
12. An endpoint of an inter-process communication flow across a computer network is called
a) socket b) pipe c) port d) none of the mentioned
13. A _____ is a TCP name for a transport service access point.
a) port b) pipe c) node d) none of the mentioned

14. User datagram protocol is called connectionless because
a) all UDP packets are treated independently by transport layer
b) it sends data as a stream of related packets
c) it is received in the same order as sent order
d) none of the mentioned
15. Transport layer protocols deals with
a) application to application communication
b) process to process communication
c) node to node communication
d) none of the mentioned
16. Retransmission of packets must be done when
a) Packet is lost
b) Packet is corrupted
c) Packet is needed
d) All of the mentioned
17. TCP process may not write and read data at the same speed. So we need _____ for storage.
a) Packets
b) Buffers
c) Segments
d) Stacks
18. TCP groups a number of bytes together into a packet called
a) Packet
b) Buffer
c) Segment
d) Stack
19. Communication offered by TCP is
a) Full-duplex
b) Half-duplex
c) Semi-duplex
d) Byte by byte
20. Which of the following is false with respect to UDP
a) Connection-oriented
b) Unreliable
c) Transport layer protocol
d) All of the mentioned
21. Logical addressing is found in the _____ layer, while physical addressing is found in the _____ layer.
a) Physical, Network
b) Network, Physical
c) Data Link, Network
d) Network, Data Link
22. The OSI Reference Model layers, in order from top to bottom, are:
a) Application, Physical, Session, Transport, Network, Data Link, Presentation
b) Application, Presentation, Network, Session, Transport, Data Link, Physical
c) Physical, Data Link, Network, Transport, Session, Presentation, Application
d) Application, Presentation, Session, Transport, Network, Data Link, Physical
23. Which OSI layer is concerned with reliable end-to-end delivery of data?
a) Application
b) Transport
c) Network
d) Data Link
24. Which transport layer protocol provides low overhead and would be used for applications which do not require reliable data delivery?
a) TCP
b) IP
c) UDP
d) HTTP
25. The real Time streaming is an example of:
a) A UDP application
b) A TCP application
c) Both of these
d) None of these

BEST OF LUCK!