BITS Pilani
Pilani Campus

Nalanda
The On-Campus Learning Management System

Started on	Friday, 26 February 2021, 4:59 PM
State	Finished
Completed on	Friday, 26 February 2021, 5:44 PM
Time taken	45 mins

Question **1**

Correct

Marked out of 1.00

Which of the following event(s) can cause an increase in RTT of a TCP connection?

- [ ] a. Increase in Bottleneck link bandwidth
- [x] b. Another TCP connection sharing the same bottleneck link enters into the network ✔
- [x] c. Increase in path length of the connection ✔
- [ ] d. Another TCP connection sharing the same bottleneck link leaves the network

The correct answers are:
Increase in path length of the connection,

Another TCP connection sharing the same bottleneck link enters into the network

Question **2**

Correct

Marked out of 1.00

Which of the following statement(s) is TRUE for Internet Architecture?

- [x] a. Survivability is achieved on the Internet using the fate sharing ✔
- [x] b. Internet architecture follows the end-to-end principle ✔
- [ ] c. If reliability is implemented at Link Layer then no need to implement it at Transport Layer
- [ ] d. Internet architecture inherently supports one to many communication semantics

The correct answers are:
Internet architecture follows the end-to-end principle,
Survivability is achieved on the Internet using the fate sharing

Question **3**

Partially correct

Marked out of 1.00

Consider a Go-Back-3 (Window Size is 3 packets) protocol where the sender has a total of 10 packets to send. Choose the correct option(s) if every fifth packet is lost.

- [x] a. For 10 packets to be received by the receiver correctly, a total of 18 packets will be sent by the sender. ✔
- [x] b. Instead of Go-Back-3, if we use the Go-Back-5 protocol, the sender will never be able to send 10 packets. ✖
- [ ] c. For 10 packets to be received by the receiver correctly, a total of 19 packets will be sent by the sender.
- [ ] d. Instead of Go-Back-3, if we use the Go-Back-5 protocol, less than 20 packets will be sent by the sender.

The correct answers are:
For 10 packets to be received by the receiver correctly, a total of 18 packets will be sent by the sender.,
Instead of Go-Back-3, if we use the Go-Back-5 protocol, less than 20 packets will be sent by the sender.

Question **4**

Correct

Marked out of 1.00

Suppose two TCP connections, i.e., C1 and C2 are established between Client C and Server B, and one TCP connection, i.e., C3 is established between Client A and Server B. The source – destination port pair for a connection C is presented as C (X, Y). The X is source port no. and Y is destination port no. of a client. Choose the option(s) which represent valid pairs for three connections.

- a. C1 (5520, 4224), C2 (5520, 4224), C3 (6620, 4224)
- b. C1 (5520, 4224), C2 (6620, 4224), C3 (4420, 4224) ✔
- c. C1 (5520, 4224), C2 (6620, 3224), C3 (5520, 4224) ✔
- d. C1 (5520, 4224), C2 (6620, 4224), C3 (5520, 4224) ✔

The correct answers are:
C1 (5520, 4224), C2 (6620, 4224), C3 (5520, 4224),

C1 (5520, 4224), C2 (6620, 4224), C3 (4420, 4224),

C1 (5520, 4224), C2 (6620, 3224), C3 (5520, 4224)

Question **5**

Correct

Marked out of 1.00

Consider a circular Distributed Hash Table (DHT) with node identifiers in the range [0-15]. Suppose there are six peers with identifiers 2, 4, 5, 8, 12, and 14. Which (key, value) pair(s) will be stored at peer with identifier 2?

- a. (15,5) ✔
- b. (6,1)
- c. (2,1) ✔
- d. (1,5) ✔

The correct answers are:
(2,1) ,

(15,5),

(1,5)

Question **6**

Correct

Marked out of 1.00

Let SWS and RWS be the sender window size and receiver window size respectively such that SWS <= RWS. Let N be the number of bits used for the sequence number. Which of the following conditions should be satisfied for the proper operation of GBN and SR reliable data transfer protocols.

- [x] a. SR: SWS+RWS <= 2^N ✔
- [x] b. SR: SWS <= 2^{N-1}, RWS <= 2^{N-1} ✔
- [ ] c. GBN: SWS <= 2^{N-1}, RWS <= 2^{N-1}
- [x] d. GBN: SWS <= 2^N -1, RWS =1 ✔

The correct answers are: GBN: SWS <= 2^N -1, RWS =1,
SR: SWS <= 2^{N-1}, RWS <= 2^{N-1},
SR: SWS+RWS <= 2^N

Question **7**

Partially correct

Marked out of 1.00

Which of the following statement(s) is TRUE for circuit and packet switching?

- [ ] a. In a packet-switched network connection, packets transmitted between a certain source host and destination host may or may not follow the same set of links.
- [ ] b. A packet-switched network can guarantee a certain amount of end-to-end bandwidth for the duration of a connection.
- [x] c. A 4 Mbps link equally divided among 4 users using FDM and a 4 Mbps link equally divided among 4 users using TDM provide same throughput to a particular user. ✔
- [x] d. In TDM circuit switching, each host gets the same slot in a revolving TDM frame. ✔

The correct answers are:
In a packet-switched network connection, packets transmitted between a certain source host and destination host may or may not follow the same set of links.,

In TDM circuit switching, each host gets the same slot in a revolving TDM frame. ,

A 4 Mbps link equally divided among 4 users using FDM and a 4 Mbps link equally divided among 4 users using TDM provide same throughput to a particular user.

Question **8**

Correct

Marked out of 1.00

Consider a web page having 4 small objects (each object can be transferred in one segment). Assume that HTTP GET request is piggybacked in the ACK of the SYN-ACK segment. You can assume all objects are on the same web server and the browser's cache is empty. Ignore RTTs required for DNS query in your calculation.

Consider the following statements:

I. Non-persistent HTTP with no parallel TCP connections will take 8 RTTs

II. Persistent HTTP with pipelining will take 3 RTTs

III. Persistent HTTP without pipelining will take 6 RTTs

- [ ] a. I and II are correct
- [ ] b. I, II, and III are correct
- [x] c. II and III are correct ✔
- [ ] d. Only II is correct

The correct answer is:
II and III are correct

Question **9**

Partially correct

Marked out of 1.00

Assume that there are 6 routers (R1 to R6) in a path from source computer S to destination computer D. The path taken by a packet is S->R1, R1->R2, R2->R3, R3->R4, R4->R5, R5->R6, R6->D. Assume that the length of each link is 600 KM, the bandwidth of each link is 1 Mbps, speed of signal on each link is 3 x 10^8 meter/sec. Choose the correct option(s) for a file to be transmitted from S to D, where this file is divided into 100 packets, with each packet having 1000 bits.

- [x] a. If link bandwidth of each link is reduced by half, transmission delay and propagation delay for each link will become the same. ✔
- [x] b. First packet will take 21 millisec to reach D ✔
- [x] c. After receiving the first packet, D would receive remaining packets at the rate of 1 packet per millisec ✔
- [ ] d. Sum of total transmission delay and propagation delay to transmit the file is 113 millisec.

The correct answers are:
First packet will take 21 millisec to reach D,

Sum of total transmission delay and propagation delay to transmit the file is 113 millisec.,

If link bandwidth of each link is reduced by half, transmission delay and propagation delay for each link will become the same.,

After receiving the first packet, D would receive remaining packets at the rate of 1 packet per millisec

Question **10**

Partially correct

Marked out of 1.00

Which of the following statement(s) is CORRECT with respect to TCP protocol?

- [ ] a. Suppose host A is sending a large file to host B over a TCP connection. The number of unacknowledged bytes that A sends cannot exceed the size of the advertised receiver buffer.
- [ ] b. Suppose that the last SampleRTT in a TCP connection is equal to 2 sec. Then the current value of Timeout for the connection will necessarily be less than 2 sec
- [x] c. Host A is sending a large file to host B over a TCP connection. Assume host B has no data to send to host A. Host B will send acknowledgment to host A without sending any data. ✔
- [x] d. Suppose that the last SampleRTT in a TCP connection is equal to 2 sec. Then the current value of Timeout for the connection will necessarily be more than 2 sec ✖

The correct answers are:
Suppose host A is sending a large file to host B over a TCP connection. The number of unacknowledged bytes that A sends cannot exceed the size of the advertised receiver buffer., Host A is sending a large file to host B over a TCP connection. Assume host B has no data to send to host A. Host B will send acknowledgment to host A without sending any data.

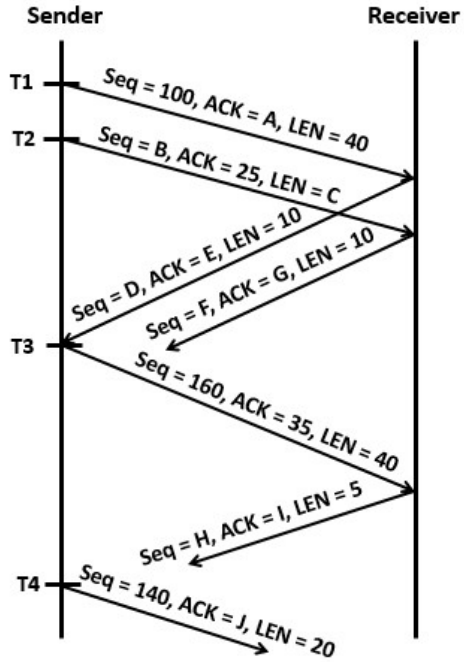
Question **11**

Correct

Marked out of 1.00

The data transfer for a TCP connection is shown in the below figure. The missing sequence numbers (Seq), acknowledgment numbers (ACK), and segment length (LEN) are indicated by alphabets A to J. Choose the correct option(s) which shows correct values for the missing information indicated by the alphabets A to J.

Consider the following assumptions:
• No timeouts occur at the receiver.
• The sender starts the timer at T1.
• There are no delayed acknowledgments at the sender or the receiver.



- [ ] a. C=20, D=25, E=120, F=35
- [x] b. A = 25, B= 140, E=140, F=35 ✔
- [x] c. G=160, H=45, I=200, J=35 ✔
- [ ] d. A = 25, B= 140, C=20, D=40

The correct answers are:
A = 25, B= 140, E=140, F=35,

G=160, H=45, I=200, J=35

Question **12**

Correct

Marked out of 1.00

Suppose that you have created a new website with the domain name csis.bitspilani.edu. The authoritative DNS server for the domain is dns.bitspilani.edu. You need to insert certain DNS resource records at TLD and authoritative DNS servers to make your website accessible over the Internet. Choose the option(s) which are correct.

- [x] a. NS record needs to be inserted at TLD server ✔
- [ ] b. CNAME record needs to be inserted at TLD server
- [x] c. A record needs to be inserted for dns.bitspilani.edu at TLD server ✔
- [x] d. A record needs to be inserted for csis.bitspilani.edu at dns.bitspilani.edu ✔

The correct answers are:
NS record needs to be inserted at TLD server,

A record needs to be inserted for csis.bitspilani.edu at dns.bitspilani.edu,

A record needs to be inserted for dns.bitspilani.edu at TLD server

Question **13**

Correct

Marked out of 1.00

UDP and TCP use checksum for detecting errors in the packet. Which of the following statement(s) is correct for the checksum-based error detection method?

- [ ] a. Checksum can detect all combinations of 2-bit errors in the packet
- [x] b. If all bits of the checksum calculated at the receiver host is 1 then the received packet is considered error-free ✔
- [x] c. If any one bit of the checksum calculated at the receiver host is 0 then the received packet is considered erroneous ✔
- [x] d. Checksum can detect all combinations of 1-bit errors in the packet ✔

The correct answers are:
If all bits of the checksum calculated at the receiver host is 1 then the received packet is considered error-free,

Checksum can detect all combinations of 1-bit errors in the packet,

If any one bit of the checksum calculated at the receiver host is 0 then the received packet is considered erroneous

Question **14**

Partially correct

Marked out of 1.00

Choose the incorrect option(s) with respect to the TCP segment header.

- [x] a. If the RECEIVE WINDOW field has stored value 10, this necessarily means that the receiver is willing to receive 10 bytes. ✔
- [x] b. If the HEADER LENGTH field has stored value 10, this means that the TCP header size is 10 bytes. ✔
- [x] c. While designing a new network application, the designer is free to use any port number between 0 to 2^{16}-1 ✔
- [x] d. If a host sends a segment with RST value 1 then it means the host is indicating to the remote host that there is no socket created at the host for the segment received from the remote host ✖

The correct answers are:
If the HEADER LENGTH field has stored value 10, this means that the TCP header size is 10 bytes.,

If the RECEIVE WINDOW field has stored value 10, this necessarily means that the receiver is willing to receive 10 bytes.,

While designing a new network application, the designer is free to use any port number between 0 to 2^{16}-1

Question **15**

Incorrect

Marked out of 1.00

A user requests a Web page that consists of some text and 3 images. The browser's cache is empty and HTTP 1.0/HTTP1.1 protocol is used. For this page, the client's browser -

- [ ] a. Sends 1 HTTP request message and receives 3 HTTP response messages
- [ ] b. Sends 4 HTTP request messages and receives 4 HTTP response messages
- [ ] c. Sends 3 HTTP request messages and receives 3 HTTP response messages
- [x] d. Sends 1 HTTP request message and receives 4 HTTP response messages ✖

The correct answer is:
Sends 4 HTTP request messages and receives 4 HTTP response messages

Question **16**

Correct

Marked out of 1.00

Suppose that 100 KBytes of user data has to be sent from host A to host B passing through 4 switches employing packet switching. Suppose the data rate on each of the links is 1Mbps and that each packet carries a header of 40bytes. What value of payload size (payload in the packet excluding header) minimizes the total delay in delivering the user data? Total delay: first bit was sent from A to when the last bit was received at B. Ignore propagation/processing delay.

- a. 40 Bytes
- b. 1000 Bytes ✔
- c. 2000 Bytes
- d. Infinite

The correct answer is:
1000 Bytes

Question **17**

Correct

Marked out of 1.00

A TCP server S receives an SYN segment from a client C, with the sequence number 100. Suppose that the server uses an initial sequence number = 200, and transmits the SYN-ACK segment. Client C receives this segment.

What will be the modified state of the client and the sequence number of ACK sent by the client?

- a. SYN-RECEIVED, 200
- b. SYN-ACK RECEIVED, 201
- c. ESTABLISHED, 201 ✔
- d. LAST-ACK, 201

The correct answer is:
ESTABLISHED, 201

Question **18**

Correct

Marked out of 1.00

Choose the correct statement(s) for UDP and TCP sockets?

- [ ] a. The TCP server needs n sockets to support n simultaneous connections.
- [x] b. The TCP server needs n+1 sockets to support n simultaneous connections. ✔
- [x] c. The UDP server needs 1 socket to support n simultaneous connections. ✔
- [ ] d. The UDP server needs n sockets to support n simultaneous connections.

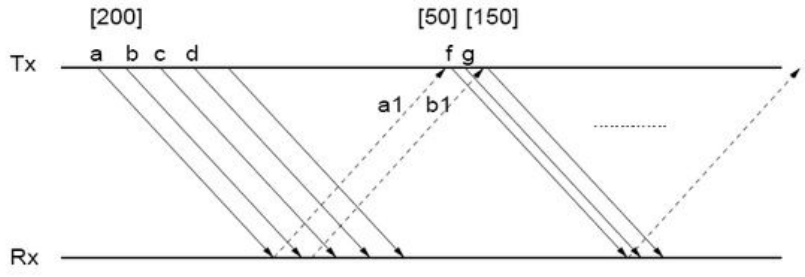
The correct answers are:
The TCP server needs n+1 sockets to support n simultaneous connections.,
The UDP server needs 1 socket to support n simultaneous connections.

Question **19**

Not answered

Marked out of 1.00

Let us assume that the transmitter has a very large amount of data to send and, further, that every transmitted segment is acknowledged by the receiver. Suppose that the initial offered window, advertised by the receiver is 1000 Bytes, and the MSS is 200 Bytes. The sender sends 5 segments, each carrying 200 Bytes — these are the segments a, b, . . ., e. Assume that the transmitter and receiver are very fast so that it takes zero time to process a received segment or ack and transmit a segment or ACK.



Consider the following statements

1. The offered window returned by the receiver along with the acknowledgment packet a1 (acknowledging a) will be 800.
2. Upon reception of the acknowledgment a1, the transmitter can send 200 bytes.
3. Suppose that when sending bytes 1001 to 2000, for some reason, the transmitter sends 2 segments of sizes 50 and 150 bytes, instead of a single segment of size 200 (segments f and g in the figure), and then resumes sending full-sized segments. Upon reception of the ACK corresponding to segment f, the transmitter sends 150 Bytes only.

- a. Statement 1 and 2 both are correct
- b. Only Statement 2 is correct
- c. Only Statement 3 is correct
- d. Only Statement 1 is correct

The correct answer is:
Only Statement 2 is correct

Question **20**

Not answered

Marked out of 1.00

Suppose that Selective Repeat ARQ is modified so that ACK messages contain a list of the next m segments that it expects to receive. Which of the following statement(s) is correct in regard to the performance improvement of this modified selective repeat ARQ protocol.

- a. The performance will increase in the case with a high error rate.
- b. The proposed modification will not affect the performance in any case and will only increase the complexity of the protocol.
- c. The performance will increase in the case when the RTT is small
- d. The performance will increase in the case when the RTT is large

The correct answers are:
The performance will increase in the case with a high error rate.,

The performance will increase in the case when the RTT is large

◄ ANNOUNCEMENTS

Jump to...