


National University of Computer and Emerging Sciences, Lahore Campus

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	Exam Type:	Mid-2		

Student Name: _____ **Roll No.** _____ **Section:** _____

Instruction/Notes: Attempt questions on this paper. You may use rough sheet but it should NOT be attached to this paper as it will not be marked. Blotting this paper will result in negative marking. You may use simple calculators. Sharing of any resources is prohibited.

Question 01: MCQs: Select only ONE correct answer and fill the table given below. Answers outside the table will not be considered. **(10)**

1	A	6	B
2	D	7	C
3	A	8	A
4	D	9	A
5	D	10	B

- In TCP, sending and receiving data is done as
 - Stream of bytes
 - Sequence of characters
 - Lines of data
 - Packets
- Which of the following protocols uses UDP to retrieve emails from server
 - SMTP
 - POP3
 - IMAP
 - None of the above
- Communication offered by TCP is
 - Full-duplex
 - Half-duplex
 - Semi-duplex
 - Byte by byte
- Which of the following protocols are stateless?
 - TCP
 - HTTP
 - UDP
 - Both b and c

5. Which of the following is NOT a pipelining protocol?
 - a. TCP
 - b. GBN (Go-back-N)
 - c. Selective Repeat
 - d. Stop-and-wait
6. In TCP specification, how are out-of-order segments handled at receiver
 - a. TCP specs uses sequence numbers to reorder segments
 - b. It doesn't say anything about reordering segments
 - c. It is the job of the application layer to reorder segments
 - d. Presentation layer presents the reordered segments to application layer
7. The value of acknowledgment field in a segment defines
 - a. Number of previous bytes to receive
 - b. Total number of bytes to receive
 - c. Sequence number of next bytes to receive
 - d. Sequence of zero's and one's
8. In segment header, sequence number and acknowledgment number field refers to
 - a. Byte number
 - b. Buffer number
 - c. Segment number
 - d. Acknowledgment
9. The receiver of the data controls the amount of data that are to be sent by the sender is referred as
 - a. Flow control
 - b. Error control
 - c. Congestion control
 - d. Error detection
10. Size of source and destination port address of TCP header respectively are _____
 - a. 16-bits and 32-bits
 - b. 16-bits and 16-bits
 - c. 32-bits and 16-bits
 - d. 32-bits and 32-bits

Question 02: Consider the messages sent between Host A and B as shown in *figure 1*. Assuming all segments sent between the hosts to be of equal size (in bytes), populate the table 1 for the two protocols i.e. TCP and GBN. The data for *Packet-1/Segment-1* is already given as a sample.

(6+4)

a)

Table 1

TCP				GBN		
	Seq	Acks	Buffer contents	Seq	Acks	Buffer contents
Pkt 1	Seq= 90	Ack= 98	Buffer= -	Seq= 90	Seq= 90	Buffer= -
Pkt 2	Seq= 98	Ack= -	Buffer= -	Seq= 98	Seq= 98	Buffer= -
Pkt 3	Seq= 106	Ack= -	Buffer= -	Seq= 106	Seq= 98	Buffer= -
Pkt 4	Seq= 114	Ack= 98	Buffer= 4	Seq= 114	Seq= 98	Buffer= -
Pkt 5	Seq= 122	Ack= 98	Buffer= 4,5	Seq= 122	Seq= 98	Buffer= -
Pkt 6	Seq= 130	Ack= 98	Buffer= 4,5,6	Seq= 130	Seq= 98	Buffer= -
Pkt 7	Seq= 98	Ack= 106	Buffer= 4,5,6	Seq= 138	Seq= 98	Buffer= -

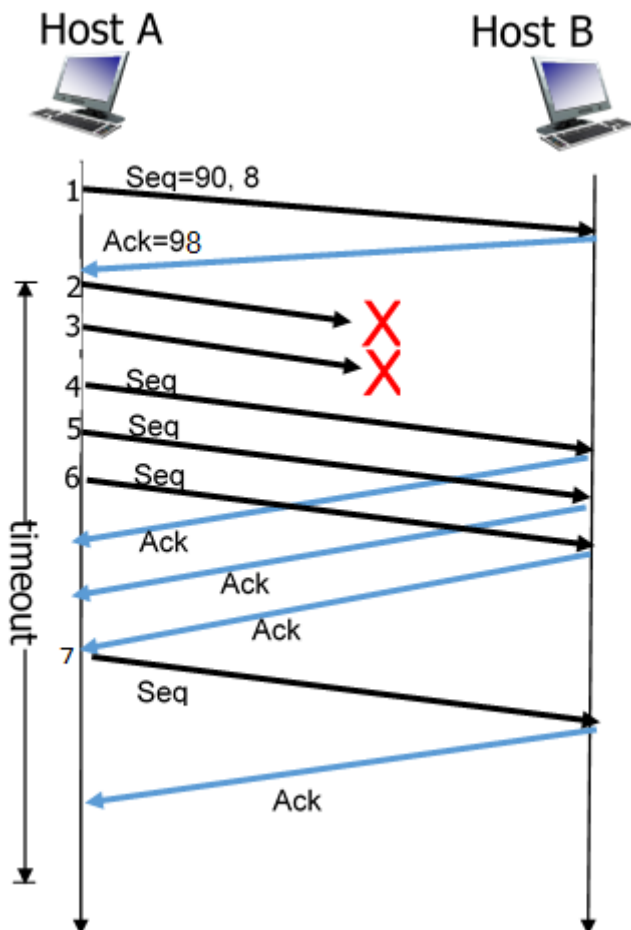


Figure 01

b) What will be the action taken by GBN sender when acknowledgement because of segment 6 is received?

GBN doesn't do fast retransmit. It will simply send the next packet.

c) What will be the action taken by TCP sender when acknowledgement because of segment 6 is received?

It will do fast retransmit. i.e. send the lowest unacked packet. In this case, packet 2.

d) What will be the action taken by GBN sender when timeout occurs as shown in fig.1?

GBN will resend all unacked packets starting from 2 to 7.

e) What will be the action taken by TCP sender when timeout occurs as shown in fig.1?

It will send lowest unacked packet. i.e. It will send packet 3 since packet 2 has already been resent using fast retransmit.

Question 03. *Figure 2* demonstrates an end system in FAST-NU labs attempting to resolve a hostname via DNS. Note that this particular DNS resolution required an exchange of 8 DNS messages across the internet.

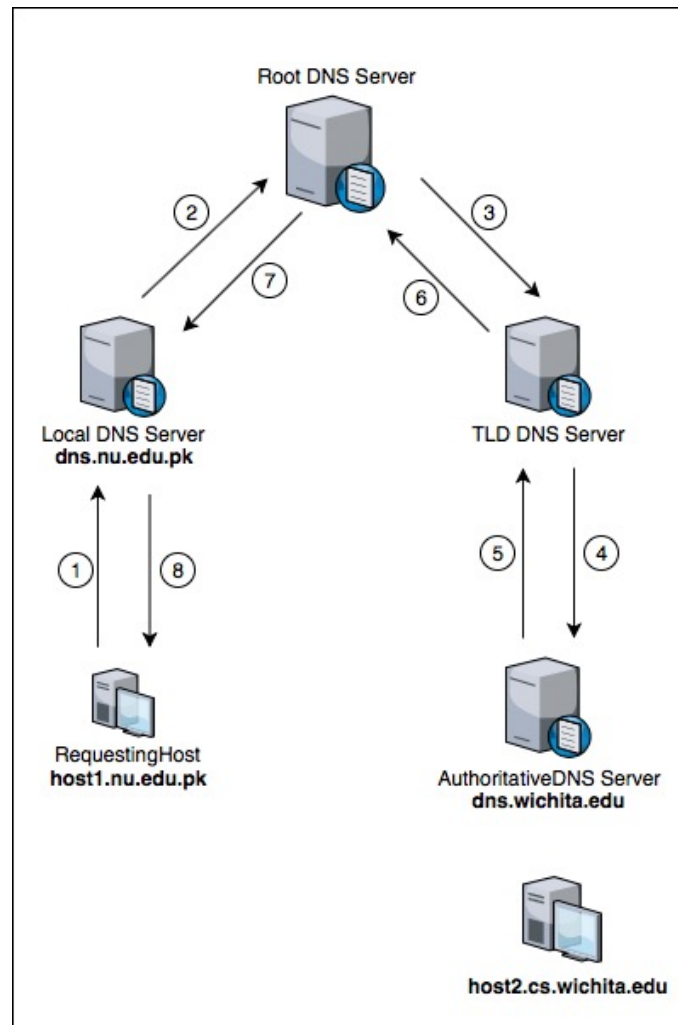
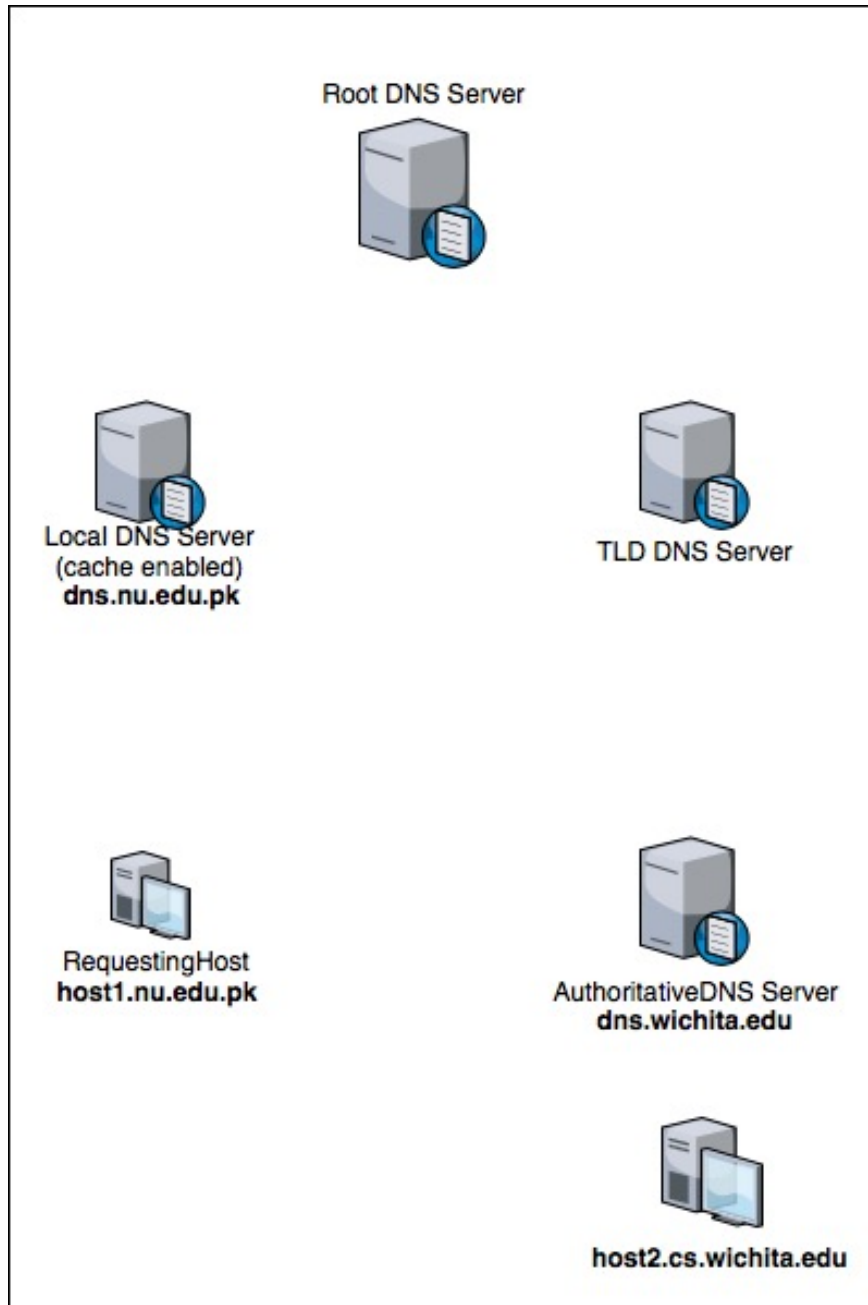


Figure 2

- a) What type of DNS query is used in making the above request; *recursive* OR *iterative*? How many DNS messages would be required if the requesting host were to deploy the other approach? (2+2 points)

- b) The local DNS server has caching enabled. Using an *iterative query* and assuming that the local cache already has an A-record with TLD DNS server's IP address, draw the step-by-step path that the DNS query will take. (6 points)



Q3 solution:

- a) Recursive; 8 messages

b)

