

## Assignment-4

<b>Department:</b> Computer Engineering & Applications	<b>Set:</b> I
<b>Programme:</b> B.Tech	<b>Branch:</b> CSE
<b>Subject Name:</b> Computer Network	<b>Subject Code:</b> BCSC0008
<b>Year:</b> II	<b>Semester:</b> III

1. Suppose a TCP connection starts with a cwnd of 6 MSS and an ssthresh of 18 MSS. The connection experiences packet loss after the 3rd RTT.
  1. Calculate the cwnd after the first RTT.
  2. Determine the cwnd after the second RTT.
  3. Find the new ssthresh value and the cwnd after the slow start phase.
2. Consider the three-way handshaking mechanism followed during TCP connection establishment between host P and host Q. Let X and Y be two random 32-bit starting sequence numbers chosen by P and Q respectively. Suppose P sends a connection request message to Q with a TCP segment having SYN bit 1, SEQ number X, and ACK bit-0. Suppose Q accepts the connection request. Show how the information is represented in the TCP segment header that is sent by Q to P? How does TCP 3-way handshake mechanism address the following problems?
  1. Delayed arrival of SYN Packet.
  2. Delayed arrival of ACK Packet
3. An IPv4 packet has arrived with the first few hexadecimal digits as shown.  
0x45000028000100000102. ... How many hops can this packet travel before being dropped? The data belong to what upper-layer protocol?
4. How the anonymous FTP is used to provides a method for the general public to access files on remote sites? Why should there be limitations on anonymous FTP?
5. Guest Wi-Fi with 50 hosts. A medium-sized company has the IP address 172.16.0.0/16 for its main network. They need to create multiple subnets to accommodate different departments and requirements:
  1. Engineering Department with 200 hosts.
  2. Finance Department with 100 hosts.
  3. HR Department with 50 hosts.
  4. IT Department with 25 hosts.
  5. Guest Wi-Fi with 50 hosts.
6. You are a system administrator responsible for maintaining a network of computers within a research institution. A group of researchers is having trouble connecting to an FTP server to download some important datasets for their project. They report that they are getting a "Connection refused" error when trying to access the server. what steps would you recommend to diagnose and troubleshoot the "Connection refused" error in the context of FTP? Outline the process you would follow to identify and resolve the issue.
7. In a RSA cryptosystem, a participant A uses two prime numbers  $p = 13$  and  $q = 17$  to generate her public and private keys. If the public key of A is 35, then the private key of A is .
8. In an RSA system, the public key of a given user is  $e = 31$ ,  $n = 3599$ . What is the private key of this user?
9. What is DNS? What resource records are associated with it? Explain.



## Theory Assignment

10. Explain the role of HTTP methods and status codes in the Hypertext Transfer Protocol (HTTP). Provide a detailed description of at least three common HTTP methods used in client-server communication, including their purposes and typical use cases.