

Assignment-1¹

Overview

1. (a) What is the difference between a “host” and an “end system”? List the different types of end systems ?
(b) Provide a brief, high-level description of how internet’s connection-oriented service provides reliable transport ?
2. (a) Describe briefly about Circuit and Packet Switching?
(b) What advantage does a circuit-switched network have over packet-switched network?
(c) What advantages does TDM have over FDM in a circuit-switched network?
3. (a) A network uses a TDM with 24 slots and have a bit rate of 1.536 Mbps. Let the circuit establishment time be 500 msec. Calculate how long it takes to send a file of 6,40,000 bits over this TDM network. (*Hint: Circuit Transmission rate = Bit rate / Number of slots*).
(b) Write a short notes on different types of delays in Packet-Switched networks.
4. (a) Explain very briefly about TCP and UDP.
(b) Suppose you are developing an application for the internet. Would you have your application run over TCP or UDP ? Elaborate?
5. (a) What are the five layers in the internet protocol stack? What are the principle responsibilities of each of these five layers?

¹Due date: 13th March 2007, 3:30 pm. To be submitted in the Office.

- (b) Consider a communication link that transmits 10,000 bits per second. The objective is to transmit a file of B bits. A synchronous transmission is used. The bits are sent in packets of P bits. Each packet contains 16 extra bits, which are used for error control. Two packets are separated by at least 10 ms. Find the total time taken to transmit the file as a function of B and P .
6. Consider the queuing delay in a router buffer (preceding an outbound link). Suppose all the packets are bits, the transmission rate is R bps, and that N packets simultaneously arrive at the buffer every LN/R seconds. Find the average queuing delay of a packet. (*Hint:* The queuing delay for the first packet is zero; for the second packet L/R ; for the third packet $2L/R$. The N^{th} packet has already been transmitted when the second batch of packets arrives)