Week- 5

Peer-graded Assignment: Fundamentals of Network and Digital Communication

Project Title *
Give your project a descriptive title

Fundamentals of Network and Digital Communication

Peer-graded Assignment: Fundamentals of Network and Digital Communication
Please give an answer to each question concisely.
1. Raise two main advantages of packet switching, compared to message switching.
2. Given a 20-bit frame and bit-error-rate p in communication. What is the probability that the frame has no error? What is the probability of 1-bit errors?
3. Give two features that the data link layer and transport layer have in common, and further give two features in which they differ.
4. Which OSI layer is responsible for (a) determining the best path to route packets; (b) providing end-to-end reliable communications; (c) providing node-to-node reliable communications?
5. How does the network layer in a connection-oriented packet-switching network differ from the network layer in a connectionless packet-switching network?
ANSWERS :
Reducing delay, The first packet of a multi packet message can be forwarded before the second one has completely arrived.
Probability
I. Probability that the frame has no error, P=(1-p)20P=(1-p)z

II. Probability of 1-bit errors, P=(201)p(1-p)19
Data layer & Transport layer
 Two features that the data link layer and transport layer have in common
 Both layers offer recovery from transmission errors.
 Provides flow control.
 Two features that the data link layer and transport layer differs :
 Data layer can be used for transmission of data while transport layer is not used for data transmission.
 Data layer has only 2 layers while the transport layer consists of 4 layers.
OSI layers
A. Network layer
B. Transport layer
C. Transport layer

Network layer
 Connection oriented service is related to the telephone system. It includes the connection establishment and connection termination. In connection-oriented service, the Handshake method is used to establish the connection between sender and receiver.
 Connection-less service is related to the postal system. It does not include any connection establishment and connection termination. Connection less Service does not give the guarantee of reliability. In this, Packets do not follow the same path to reach their destination.

A bit stream 1101011011 is transmitted using the standard CRC method. The polynomial generator is x+ x + 1. What is the actual bit string transmitted? Show the major steps to your answer.
Bit stream= 1101011011
The bit stream is transmitted,
Polynomial generator = x+x=1
The Bit form = 111

Thus, n=3.

Suppose a IP header consists of four 16-bit words: (11111111 11111111, 11111111 00000000, 11110000 11110000, 11000000 11000000). Please find the Internet checksum for the code.
bO = 11111117 11111111 = 2416- 1 = 65535
b1 = 11111111 00000000 = 65280
b2 = 11110000 11110000 = 61680
b3 = 11000000 11000000 = 49344
x= b0 + b1 + b2 + b3 modulo 65535 = 241839 modulo 65535 = 45234
b4 = -x modulo 65535 = 20301
The internet checksum = 01001111 01001101

Suppose that a group of computers is connected to an Ethernet LAN. If the computers communicate only with each other, does it make sense to use IP protocol in the computers? Should the computers run TCP directly over Ethernet? How is addressing handled?
Indeed, IP convention can be utilized in the PC, since the IP convention is a lot of necessities for tending to also as directing information on the Internet. Moreover, The PCs ought not run TCP legitimately over Ethernet. Since, the computer can't run principles based TCP without IP, as TCP uses IP addresses. There is a need to utilize an individual custom streaming convention that depends on Ethernet or another link layer as a lower layer.

(1) The figures below show the TCP/UDP communication pattern diagrams. Which diagram works for TCP? Why?
(2) Fill the missing steps (blank boxes) in both diagrams for TCP/UDP correspondingly.

Answers :
1) Diagram (b) will work for TCP, since it is a network protocol that shows the details of how

data is sent as well as received.
2) Missing steps : (a) bind, connect , (b) bind>listen>accept, connect.