IN2511 – Computer Networks

Takehome Assignment 04

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Index No: 214121P

1) (a)

(i) Transmission control protocol (TCP)

* User Datagram Protocol (UDP)

(ii)

- TCP is a connection oriented protocol connection that it needs to be establish a connection before transmitting the data.

  UDP is a datagram oriented protocol as no need of opening a connection before transmitting data.

- The realibility of data transfer is high in TCP

  The realiability is low in UDP.

- Retransmission of lost packets is possible in TCP.

  Retransmission is not allowed in UDP

- TCP donot support broadcasting. Therefore it is used ~~for~~ in situations such as in emails, web surfing and military services.

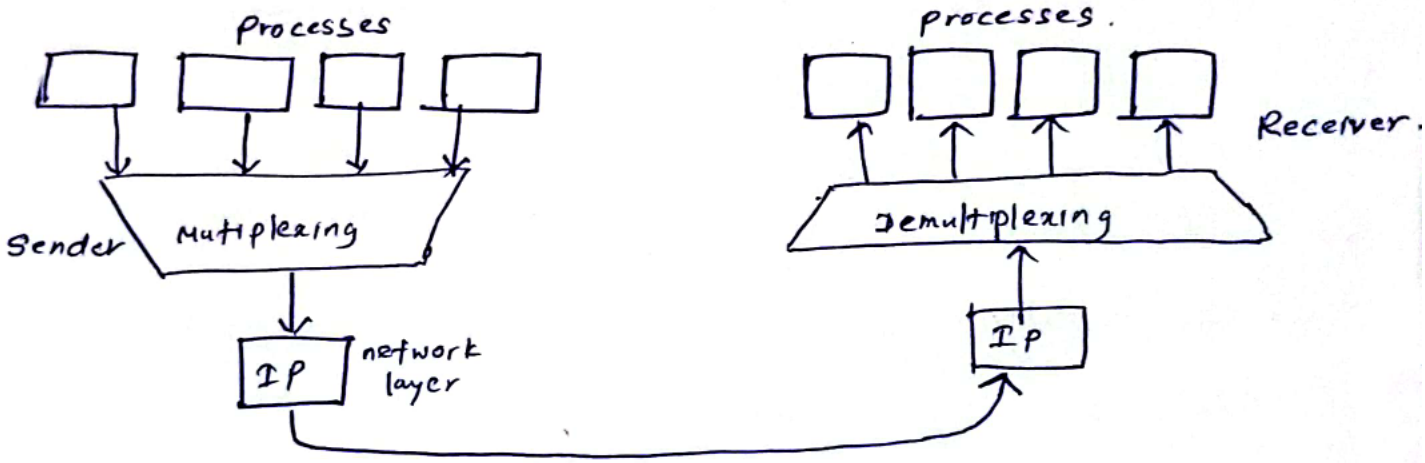
  UDP supports broadcasting. Therefore it is used in video and music streaming etc.

b) Multiplexing

The process of gathering / encapsulating data messages from different processes with header information and passing segments to network layer at the sending node is called Multiplexing.

Demultiplexing.

The process of delivering received encapsulated data messages from the network layer to the correct processes/ applications at receiving end is called ~~the~~ Demultiplexing.



(c) • Packetizing

Sender: Breaking the application messages to segments and sending to network layer.

Receiver: Receiving the host deliver data to receiving host

• Connection Control.

↳ connection oriented: Making connection between sender and receiver before transmitting data to make synchronization between sender and receiver.

↳ connectionless:

Transmitting data without creating a ~~co~~ pre connection between sender and receiver.

- Addressing

  Identifing ~~port~~ to send and receive data from network layer through port numbers.

- Realibility.

  Making realibility of data transmission through flow control and error control.

4) (i) Flow Control.

~~Controle~~ Flow control is regulating the rate of flowing data ~~in~~ between nodes of networks ~~are~~ of sender according the buffer size of receiver informing by controlling packets.

(ii) Error Control.

Error controling is idetifing the lost packets by overflowing the buffers at receiving end. It is done by 2 ways

→ pushing : Client open a connection to server and keep the connection active #uhtil get a data.

→ pulling : Client perrodically connect to server, checks for data and disconnect from server perrodically.

(iii) Congestion control.

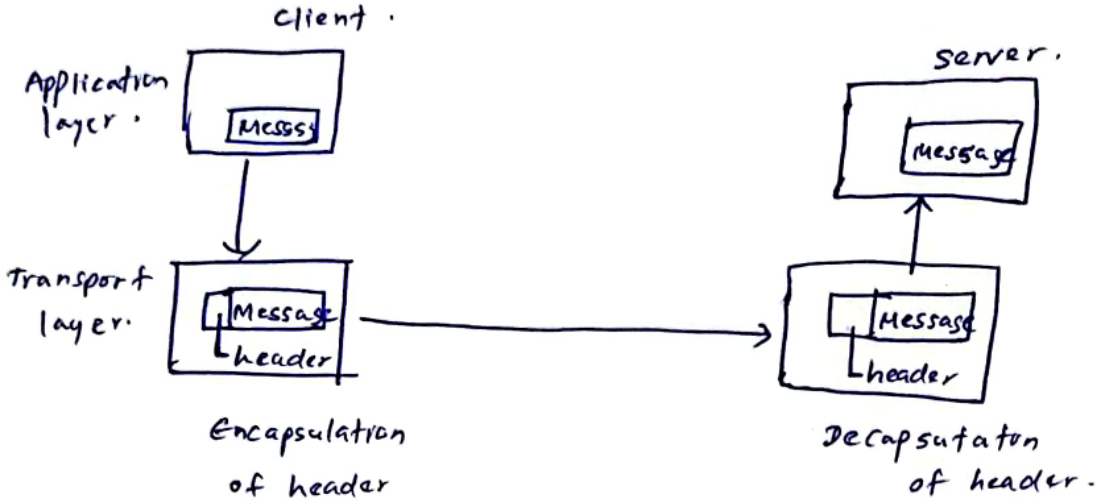
Congestion control is a mechanism that controling the entry of data packets to a network, preventing congestive collapse and enabling better use of shared network infrastructure. It is done by 3 methods traffic ware routing, provisioning and admission control.

(e) TCP is realiable than the UDP. but the transmission speed of UDP is higher than TCP as UDP is using connectionless data delivary. And also UDP has smaller header than TCP improving the efficiency. Therefore the UDP is used in real time applications such as video, audio streaming, Live data feeds, DNS lookups etc.

(f)
- 2 nodes of connection are connected before sending any data and synchronized with each other in connection oriented protocol. It is supported by TCP. it is realiable and donot fast.
- Nodes are not connected before sending data in connection less protocol. It is supported by UDP protocol. It is not realible, but fast.

(g) Encapsulation is attaching new ~~data~~ information in the application layer as it is passed to next layers. This additional information is called header ~~and~~ and it is attached in sending node.

Decapsulation happens in receiving end and it is removal of additional information and extracting original data at each layer.



(h) The transport layer user port addressing to assign a unique address to each application by combining IP address from network layer and port number from ~~application~~ transport layer.

Transport layer header includes a service point address which is port address. When a server application is launched on host, it registers a port number.