Unit : 6 Transport Layer

* Explain Transport Layer Protocol.

=> There are two types of Transport Layer Protocol.

1) TCP
2) UDP

1 TCP :

TCP stands for Transmission Control Protocol which is connection Oriented Protocol.

TCP Protocol is established connection between the sender and Receiver.

TCP Protocol can transfer data in the form of contiguous stream of byte.

TCP Groups the byte in the form of TCP Segments and passed to the IP Layer.

It is assign a sequence number to each byte to be transmitted from sender to Receiver.

TCP Protocol Sender also get Data Receive ACK From the Receiver.

In Particular time, Sender not get ACK then, Sender can again send the byte.

TCP Provides Full Deplex transmission mode.

TCP Protocol can send or receive the TCP segments in both the directions.

TCP Segment is contains All the details of the byte transfer.

This are the basic information which store in TCP Segment.

(i) Source Port Address :
(ii) Destination Port Address :

<table>
<tr><td colspan="4">Source Port Address</td><td colspan="4">Destination Port Address</td></tr>
<tr><td colspan="8">Sequence number</td></tr>
<tr><td colspan="8">Acknowledgement Number</td></tr>
<tr><td>HLEN
4 bit</td><td colspan="3">Reserved
6 bits</td><td>URG</td><td>ACK</td><td>PSH</td><td>RST</td><td>SYN</td><td>FIN</td><td colspan="2">Window size</td></tr>
<tr><td colspan="4">Checksum</td><td colspan="4">Urgent Pointer</td></tr>
<tr><td colspan="8">Options & Padding</td></tr>
</table>

(iii) Sequence Number
(iv) Acknowledgement Number etc.

TCP Protocol Header size is 20 bytes.

2 UDP:

UDP stands for User Datagram Protocol which is connection less Protocol.

UDP Protocol can not create connection between sender and receiver.

UDP Protocal does not Provides data transfer ACK.

UDP Protocol can transfer data in the form of data packet.

This Protocol does not Provide any information about the damaged data packet.

This Protocol is provides end-to-end transfer function.

Data Packet is also know as Datagram.

Source Port Address	Destination Port Address
Total Length 16 bits	Checksum
Data	

Datagram Packet can contain basic information about the data which is transfer from sender to Receiver.

User Datagram has 16 byte Header.

* Explain Transport Layer Services.

=> There are Five types of Services is provide by transport Layer.

(i) End-to-End Delivery
(ii) Addressing
(iii) Reliable Delivery
(iv) Flow Control
(v) Multiplexing.

(i) End-to-End Delivery :

Transport Layer Provides the function to transfer entire data from source to destination.

(ii) Addressing :

The Transport Layer Provides the user address which is specified as a station.

(iii) Reliable Delivery :

This Service is provides information about the lost and damaged

Packets.

There are four function in Reliable Delivery.

(a) Error Control: Transport layer Protocols are designed to provide error-free transmission.

(b) Sequence Control: Transport layer tcp Protocol Provides sequences for send the byte to Sender to Receiver.

(c) Loss Control: The Transport Layer ensures that all the data of transmission arrive at the destination.

(d) Duplication control: Sequence Number is allows to find out the lost or duplicate Packets.

(iv) Flow Control: Flow Control is used to prevent the transmission From sender to receiver.

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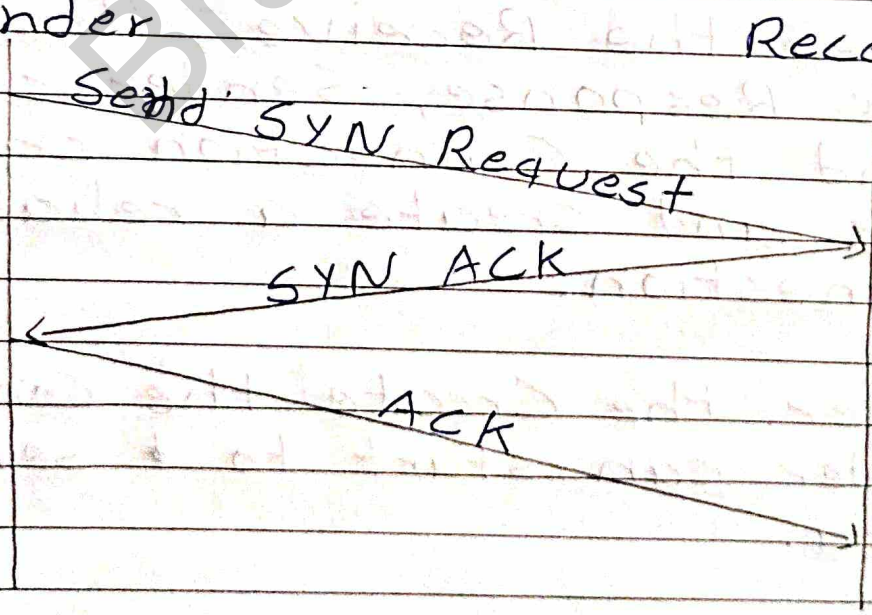
✓ Multiplexing: Transport Layer is use the multiplexing method to increase the transmission efficiency.

* Explain 3-Way Handshake Process for create a connection.

=> TCP Protocol can use the 3-Way Handshake Process for create connection between the Sender to Receiver.

Using this method, TCP Protocal create a connection.



This are the steps:

Step 1:

Sender can send the connection creation request to the Receiver side which content Synchronize Sequence Number.

Step : 2

After that Receiver responds to the Sender request. Receiver is responds with ACK and Signifies Synchronize Sequence Number.

Step 3 :

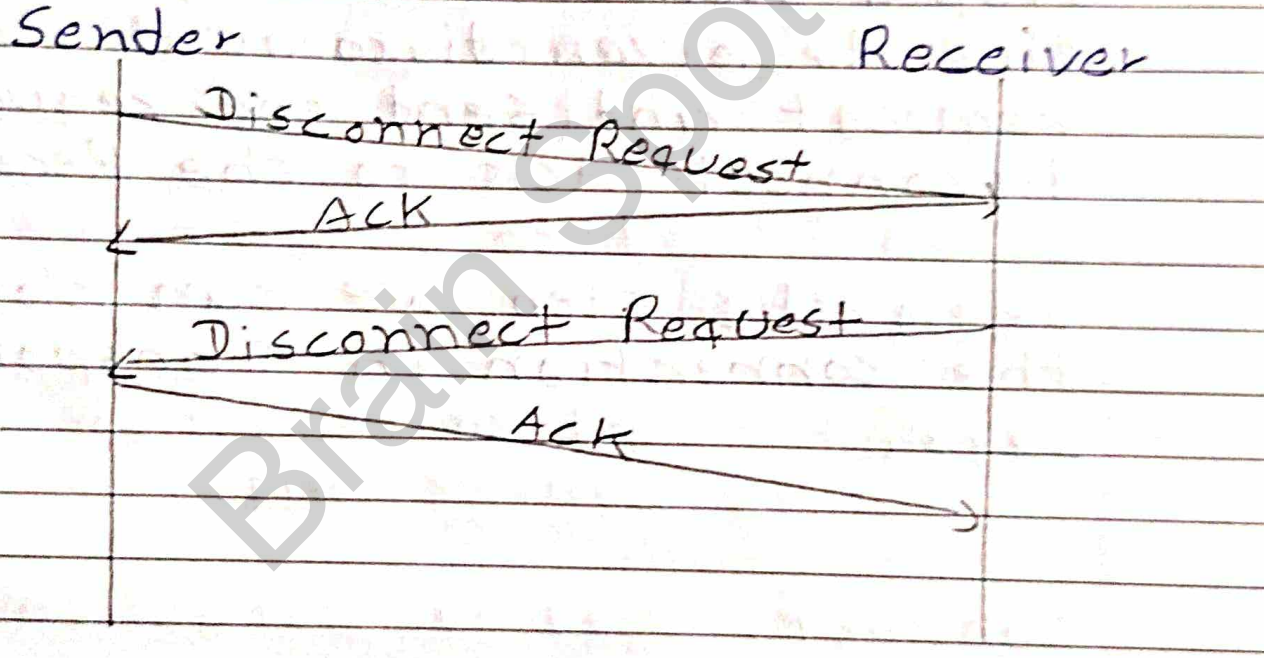
After the Receive, Receiver ACK Response, Sender can send the Connection creation ACK and create a reliable Connection.

After the Create the Connection Sender can start to send data.

* Explain Connection Release Step in transport layer.

=> After the transfer the data packet from Sender to Receiver we have to close the connection.

We have to Release the connection from both the side sender and receiver.



This are the step for Connection Release.

Step 1 : Sender can send the Disconnect Request to the Receiver.

Step 2: Receiver can response the sender Disconnect Request and send the Request disconnect ACK to the Sender.

Step 3: After that Receiver can send the Connection disconnect Request to the Sender.

Step 4: Sender can response the Receiver disconnect request and send the request disconnect ACK to the Receiver.

Using this step, we can close the connection in Transport Layer.

* Explain Transport Service Primitives.

=> Primitives are used to call the transport data in the Connection-Oriented service.

There are Five Primitives in Transport service.

(i) Listen
(ii) Connect
(iii) Send
(iv) Receive
(v) Disconnect

(i) Listen : Blocks the all Process until it tries to connects.

(ii) Connect : Sender or Receiver try to create the connection.

(iii) Send : Used to send the data packet

(iv) Receive : Block until data packet is receive

(v) Disconnect : Sender or Receiver used to disconnect connection.

-> Berkeley Sockets Primitives For TCP.

This are the Primitives.

- Socket : Create a new communication end point
- Bind : Associate a local address with a Socket.
- Listen : Used to accept the connections
- Accept : Used to establish an incoming connections.
- Connect : Used to establish the connections.
- Send : Send the data over the connection.

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- Receive : Receive data from the connection.

- Close : Used to Release the connection.