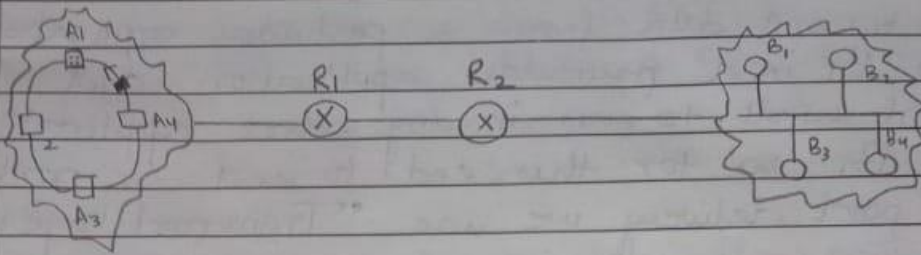


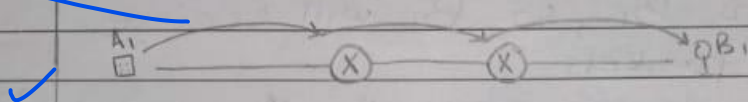
Transport layer

BIT 158009

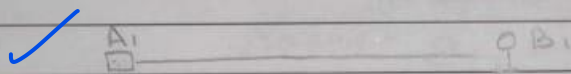
Date: 29th March 2021



In Data link layer it provides node to node delivery of data means if we want to transmit data so it will first go to R₁ and then R₂ and then to B₁. (A₁ → B₁).



The Network layer is responsible to transmit data from one node to another node.

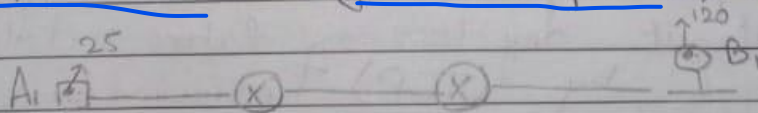


But,

it is not guaranteed that the data is reliable and in order.

Transport layer:

Transport layer is also called (Port to port) (End to End) and (process to process) because.



A system or server have many applications which transmit data. If a system application wants to transmit data for example A₁ wants.

to transmit data from a particular application to B_1 in a particular application and don't want to run in any other applications of B_1 so for this end to end or port to port delivery we use "Transport layer"

In network layer we transmit data from one node to another node eg. $A_1 \rightarrow B_1$.

But there is not any reliability that if we transmitted 4 packets of data from A_1 to B_1 , so B_1 will receive the all 4 packets.

Transport layer gives the "reliability" of the data transmission.

A_1 4 packet $\rightarrow B_1$
 A_1 $\rightarrow B_1$ 4 packets

In network layer we don't know that the data we transmitted from A_1 to B_1 will be in the order when received to B_1 or there will not be any loss of data or will be a loss of data.

Transport layer transmits data "in order" and without any loss of data. and this is done by (TCP) Transmission Control Protocol

A_1 $\rightarrow B_1$

A_1 $\rightarrow B_1$

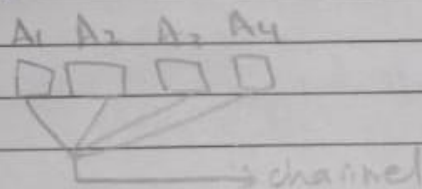
(S_1 : signal 1, S_2 : signal 2, S_3 : signal 3)

Transport layer also provides us "Error control" by (TCP) from checksum (node to node) if the sender checksum matches the receiver checksum so it will be no error.

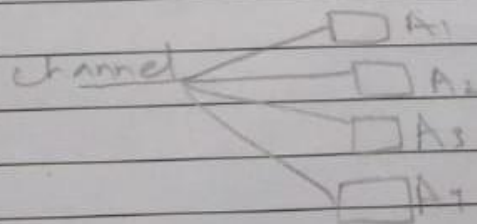
Transport layer also provides flow control and if the flow is not controlled so it also control congestion.

Transport layer divides the data into segments and give it to Network layer.

Multiplexing and demultiplexing also provided by Transport layer. On Application layer it is possible many applications sending data so it will be multiplexed by one channel.

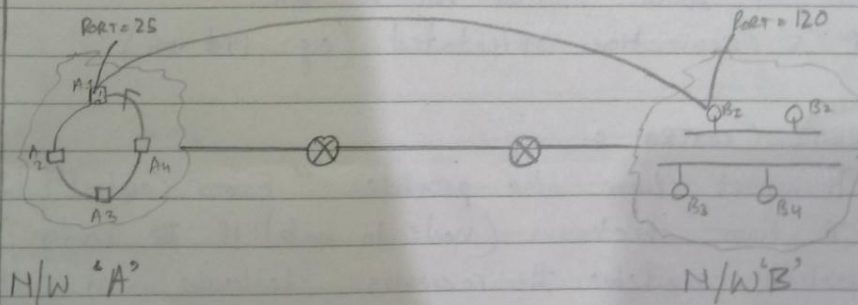


and at transport layer they are demultiplexed and received by their particular applications.



TRANSPORT LAYER:

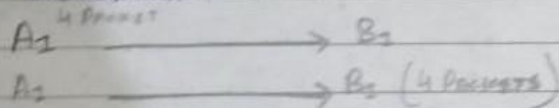
4TH Layer of OSI Model: TRANSPORT LAYER provides transparent transfer of data between end users, providing reliable data transfer services to the upper layers. The transport layer controls the reliability of a given link through flow control, segmentation and desegmentation, and error control. Some protocols are state- and connection-oriented, (this means that the transport layer can keep track of the segments and retransmit those that fail) (the transport layer also provides the acknowledgement of the successful data transmission and sends the next data if no errors occurred.) Typical examples of layer 4 are the Transmission Control Protocol (TCP) and User Datagram Protocol (UDP).



- Transport layer takes data from Application layer and pass it to Network layer.

RESPONSIBILITIES OF TRANSPORT LAYER:

1. END TO END DELIVERY OF THE DATA (Port to Port Delivery)
Let assume that A₁ wants to communicate with B₁.
If a system applications ~~which~~ transmit data want to transmit data for example A₁ wants to transmit data from a particular application to B₁ in a particular application and don't want to run in any other applications at B₁ so for this end to end or port to port delivery we use "Transport layer".
2. Transport layer gives the "reliability" of the data's transmission.



Transport layer use two major protocols namely TCP & UDP.

TCP provides reliability and follow window delivery of message.

e.g.,

✓ LIVE → LIVE

- Loss of data should not be there.
- TCP is connection orientated. (e.g., Dial tone)

3. ERROR CONTROL :-

✓ Transport layer also provides "Error Control" by TCP from checksum (node to node) if the sender checksum matches the receiver's checksum so it will be no error.

Failed

4. FLOW CONTROL : ^{Stop and wait} (SW, Go Back And, SR)

Transport layer also provides "flow control" means at which speed sender sends messages to receiver and size of message for this we use method "Advertising the window" and if the flow isn't control so it also control congestion.

5. SEGMENTATION :-

Transport layer divides these data into segments and give it to Network layer.

6. MULTIPLEXING & DEMULTIPLEXING :-

✓ Multiplexing and demultiplexing also provided by Transport layer. On Application layer it is possible many application sending data so it will be multiplexed by one channel. and at transport layer they are demultiplexed and received by their particular applications.

