TCP and UDP in Transport Layer

TCP (Transmission Control Protocol):

TCP is a layer 4 protocol which provides acknowledgement of the received packets and is also reliable as it resends the lost packets. It is better than UDP but due to these features it has an additional overhead. It is used by application protocols like HTTP and FTP.

UDP (User Datagram Protocol):

UDP is also a layer 4 protocol but unlike TCP it doesn't provide acknowledgement of the sent packets. Therefore, it isn't reliable and depends on the higher layer protocols for the same.But on the other hand it is simple, scalable and comes with lesser overhead as compared to TCP. It is used in video and voice streaming.

TCP Vs UDP –

1. **Session Multiplexing:**
   A single host with a single IP address is able to communicate with multiple servers. While using TCP, first a connection must be established between the server and the receiver and the connection is closed when the transfer is completed. TCP also maintains reliability while the transfer is taking place.
2. **Segmentation:**
3. Information sent is first broken into smaller chunks for transmission.

Maximum Transmission Unit or MTU of a Fastethernet is 1500 bytes whereas the theoretical value of TCP is 65495 bytes. Therefore, data has to be broken into smaller chunks before being sent to the lower layers. MSS or Maximum Segment Size should be set small enough to avoid fragmentation.

Flow Control: If sender sends data faster than what receiver can process then the receiver will drop the data and then request for a retransmission, leading to wastage of time and resources. TCP provides end-to-end flow control which is realized using a sliding window.

Connection Oriented:

TCP is connection oriented, i.e., it creates a connection for the transmission to take place, and once the transfer is over that connection is terminated.
UDP on the other hand is connectionless just like IP (Internet Protocol).

Reliability:

TCP sends an acknowledgement when it receives a packet. It requests a retransmission in case a packet is lost .UDP relies on the higher layer protocols for the same.