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| --- | --- |
| TCP | UDP |
| The full form of TCP is transmission control protocol. | The full form of UDP is user data gram protocol |
| Transmission control protocol is connection-oriented protocol as it creates a virtual connection between sender host and receiver host. | User datagram protocol is connectionless. |
| In case of any error during the transmission the lost packets can be recovered and retransmitted again in TCP. | User datagram protocol is unreliable protocol because it tells you that the error has occurred, but it does not specify a particularly which error has occurred. |
| Transmission control protocol in ensures the accurate delivery of packets. | UDP does not ensure the accurate delivery of data or packets. |
| Error control and flow control are the two features that TCP provide. | UDP does not offer any error control or flow control feature. |
| TCP is slower than UDP. | UDP is faster than TCP. |
| Some common header fields in transmission control protocol are source port, destination port, checksum, etc. | Some common header fields in user data gram protocol are source port destination code to checksum. |
| The header size of transmission control protocol is 20 bytes. | The header size of user datagram protocol is 8 bytes. |
| Transmission control protocol provide 3 types of handshakes synchronise, synchronise acknowledge, acknowledge. | User datagram protocol does not do any handshake as it is connectionless protocol. |

Assignment -2

## (by Anubhav Anand – E16CSE090 – B4)

### A1.

## A2.

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| --- | --- |
| Connection oriented | Connectionless |
| In connection-oriented protocol service virtual connection or network is established between sender and receiver over the internet. | In connectionless service there are no search virtual connection between sender and receiver over the internet. |
| In connection-oriented protocol authentication is needed at the destination node before transferring any kind of data. | In connectionless service there is no authentication required at destination node before transferring data message. |
| Connection oriented service requires handshaking at both the nodes that is sender node and receiver node so that a connection could be established. | In connectionless service there is no handshake required over the network. |
| In connection-oriented service there is a delay that is, it is slower than connectionless service because a virtual connection needs to be established between sender and receiver. | In connectionless service there are no delays and it is faster than connection-oriented service. |
| Connection oriented services more reliable because it ensures accurate delivery of packet to the destination host. | Connectionless service is not reliable on delivery of packets |
| In connection-oriented service during the time of delivery of packets between sender host and destination host, all the packet takes the same path until the connection is closed. | In connectionless service it is not at all necessary that path the packets will take will be same during the transmission between sender host and receiver host. |

## A3.

OSI model stands for open system interconnection which is developed by international organization of standardization. OSI model has 7 layers and each layer has specific function to perform. OSI model consists of following layers

Physical layer: physical layer is the lowest layer in OSI model, and it is responsible for transferring of bits in physical connection between the devices. Physical layer receives data in terms of bits that is 0 and 1 and it sends the bits to data link layer which is responsible for putting all the frames back together. The function that physical layer provides are bitrate control, bit synchronisation, physical topologies, transmission mode, etc.

Data link layer: data link layer is the layer 2 in OSI model. Data link layer is responsible for the movement of frame from one node to another node. Its main function is to make sure that the transfer of data is free from errors between one node to another over the physical layer. Data link layer is divided into logical link layer & media access control. Data link layer provides the following functions: framing, physical address, error control, flow control, access control, etc.

Network layer: network layer is the third layer in OSI model which is responsible for delivery of packets from source to destination. Network layer is also responsible to choose the shortest path for the transmission of packets from all the number of routes that are available in the network. The functions which network layer provides are routing and logical.

Transport layer: transport layer is responsible for delivery of message from process to process. Upon the successful transmission of data transport layer provides acknowledgement and it also retransmits the data in case of any error. Transport layer provides the following functions: segmentation and reassembly service point addressing. Transport layer also provides the following services: connection-oriented service & connectionless service.

Session layer: session layer is the fifth layer in OSI model it is responsible for synchronisation and dialogue control. Along with that is also responsible for maintenance, connection, authentication and security.

Presentation layer: presentation layer is the layer in OSI model. Presentation layer provides the following services that is encryption translation and compression.

Application layer: application layer is the seventh layer in OSI model which is also the top layer. This layer is responsible for providing services to the user.

TCP/IP model came before OSI model. TCP/IP model consists of four layers that is application layer transport layer internet layer and network access layer. Network access layer network access layer is the combination of data link layer and physical layer in the over OSI model. Network access layer searches for hardware addressing and protocols that are present in the layer which allows for the transmission of data physically.

Internet layer internet layer is like the network layer in OSI model. The network layer provides protocol which is used for the transmission of data in the network. The main protocols which the network layer uses are IP, ICMP and ARP. The full form of IP is internet protocol and is responsible for the transmission of packets from source to destination by searching for the IP addresses in the header of the packets. ICMP is internet control message protocol which is responsible providing information about the problems that occur in the network. ARP: ARP is address resolution protocol and is used to find the physical address from the IP address.

Internet Layer: Internet Layer is like the transport layer of OSI model and is responsible for the error free communication and the successful delivery of the packets across the network. The two main protocol that are present inside internet layers are transmission control protocol and user datagram protocol.

Network access layer: Network Access Layer is like top three layers of OSI model that is application layer presentation layer and session layer. Network layer is responsible for node to node communication. Protocols that are present in network layers are HTTP, HTTPS, FTP, TFTP, TELNET, SMTP, SNMP, DNS, NTP, etc.

## A4. 1.

POP3: POP3 (Post Office Protocol 3) is the latest form of a standard convention for accepting email. POP3 is a customer/server convention in which email is gotten and held for you by your Internet server.

## A4.2.

SMTP: Straightforward Mail Transfer Protocol (SMTP) is the standard convention for email benefits on a TCP/IP arrange. SMTP gives the capacity to send and get email messages.

SMTP is an application-layer convention that empowers the transmission and conveyance of email over the Internet. SMTP is made and kept up by the Internet Engineering Task Force (IETF).

## A4.3.

IMAP enables you to get to your email any place you are, from any gadget. When you read an email message utilizing IMAP, you aren't really downloading or putting away it on your PC; rather, you're understanding it from the email administration. Thus, you can browse your email from various gadgets, anyplace on the planet: your telephone, a PC, a companion's PC.

## A4.4.

HTTP: HTTP (Hypertext Transfer Protocol) is the arrangement of guidelines for moving records, for example, content, realistic pictures, sound, video, and other interactive media documents, on the World Wide Web. When a Web client opens their Web program, the client is in a roundabout way utilizing HTTP.

## A4.5

FTP Stands for "File Transfer Protocol." FTP is a convention intended for moving records over the Internet. Records put away on a FTP server can be gotten to utilizing a FTP customer, for example, an internet browser, FTP programming program, or a direction line interface.