TCP/IP PROTOCOL SUITE –

It is a hierarchial protocol that contain 5 or 4 different layers & it is developed prior to OSI network model.

5 layered TCP/IP protocol suite contain layers –

1. Application — (contain all the functions of application, presentation, session layers)
2. Transport
3. Internetwork — (same as network layer)
4. Datalink
5. physical.

4 layered TCP/IP protocol suite contain layers –

1. Application — (contains all the functions of application presentation & session layers)
2. Transport
3. Internetwork — (same as network layer)
4. Host to network interface — (contains all the functions of datalink & physical Layer).

→ Each layer contain related functionalities based protocols to support the layers below & above it. That is why it is called protocol suite.

→ Description of different Layers of TCP/IP –

1. Host to network interface (physical & Datalink Layer) –

There is no specific protocols that are supported by physical & datalink Layer, rather physical & datalink layer supports all types of standards & proprietary protocols.

2. Internetwork Layer (Network Layer)

Protocols supported by network Layer of TCP/IP are IP (internet protocol), ARP (Address resolution protocol), RARP (reverse address resolution protocol), ICMP (Internet control message protocol), IGMP (Internet group message protocol).

IP (Internet protocol)

→ It is a unreliable, connectionless protocol that provide best effort delivery. It is a host-to-host protocol because it is responsible for source to destination data transmission.

→ Unreliable means to handle error or lost, damaged, duplicate datagram IP doesnot provide error control mechanism.

→ connectionless means all the datagrams that belong to the same message behave independent of each other & may take different path or different route to reach the destination. Consequently, there is out of order data transmission.

→ Best effort delivery means despite of unreliable & connectionless service, IP give its best effort to ~~trans~~ transmit datagram to the destination but it doesnot give any guarantee.

ARP (Address Resolution Protocol)

→ ARP is used to find out the physical address of a node when its IP address is known or given. Each node in a LAN has a physical address to identify itself within that LAN. But when data move across the LAN or out of LAN then physical addre of ~~the~~ node is not helpful, at that time IP addres is necessary

IP address —ARP→ physical address
(Known or given) (Unknown or not given)

RARP (Reverse address ~~resolution~~ resolution Protocol)

→ RARP is used to find out the unknown IP address of a node if its physical address is known.
Basically, IP addresses are stored in a disk of a computer but when the computer is diskless then IP address can not be stored & it can not be retrieved. Hence in this case RARP is used to find out IP address of a given physical address.

physical Address —RARP→ IP address
(Known) (Unknown)

ICMP (Internet control message protocol)

To facilitate reliable data communication in a connectionless service like IP, ICMP is used. ICMP Protocol send notification of problem during data communication.

IGMP (Internet group message protocol)

IGMP Protocol is helpful for transmitting the same message to a group of receiver. e.g. multicasting or broadcasting.

3. Transport Layer

The transport layer supports ~~two~~ three different types of protocols. They are: TCP, & UDP & SCTP.

TCP (Transmission control protocol)

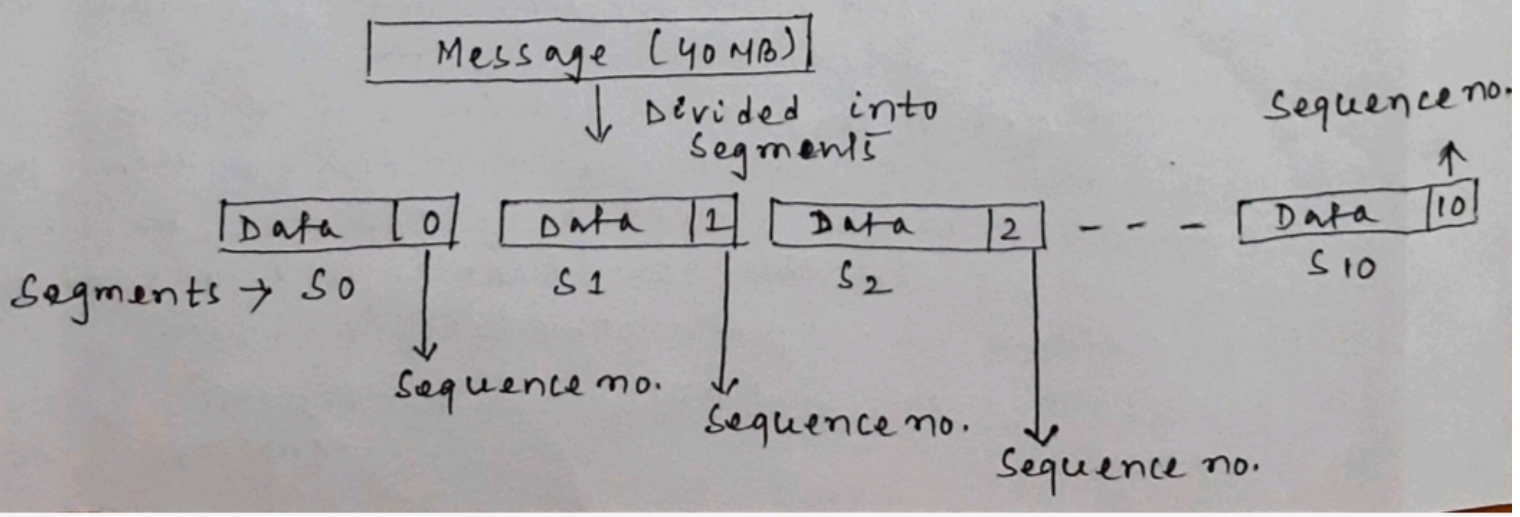
→ It is reliable, stream oriented protocol.

→ It provide connection oriented services.

→ Reliable means TCP support error control mechani -sm to handle lost, damaged & duplicate data. TCP also provide flow control mechanism to handle overwhelm -ming of data.

→ Connection oriented means before data transmission a physical or virtual path must be established between two end points or between source & destination.

→ Stream Oriented service means TCP divide the whole message into segments containing a sequence no. All the segments follows the same established path to reach the destination. consequently, the data ~~trans~~ transmission is in order. Because of the ~~seg~~ sequence no. of the segments, the lost, damaged or duplicate segments can be identified & handled so that the orderly arrangement can be maintain -ed.



UDP (User Datagram Protocol)

→ It is unreliable, connectionless protocol i:e: neither UDP support flow control nor error control mechanism so it is unreliable protocol.

→ Connectionless means before data transfer UDP doesnot establish any connection between source & destination.

→ Because of connectionless, the datagrams may choose different path to reach the destination, even if all the datagrams belong to the same message. So, it is obvious that the data transmission is out of order.

SCTP (Stream Control transmission Protocol)

→ SCTP combines good features of TCP & UDP.

→ SCTP is also reliable protocol.

→ It is message oriented protocol means the data are transmitted in terms of message.

4. Application Layer

To facilitate user level requirement, Application layer of TCP/IP supports different protocols. E.g. FTP, HTTP, SMTP, SNMP, DNS, TELNET etc.