Unlike OSI reference model, TCP/IP reference model has only four layers. They are,

1. Host-to-network layer
2. Internet layer
3. Transport layer
4. Application layer.

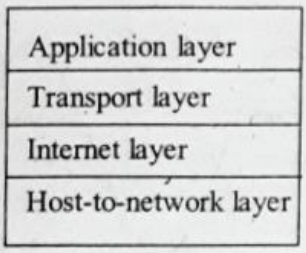

Figure (1): TCP/IP Reference Model

1. Host-to-Network Layer

Host-to-network layer in TCP/IP reference model is equivalent to the combination of physical and data link layer in OSI model. The TCP/IP reference model does not describe the functionality of this layer. However it specifies that a host must connect to a network using some protocol to send IP packets over it. The model does not define any specific protocol to be used. It varies from host to host and network to network.

2. Internet Layer

The functionality of this layer is very similar to the network layer in OSI model. The responsibility of this layer is to send IP packets from a source in one network independently to the destination potentially in a different network. The packets are routed independently each taking a different path between source and destination. So they may arrive at the receiver in a different order. If in-order delivery of packets is desired then its the job of higher layers to rearrange them in proper order.

The internet layer defines the format of these packets and a connectionless protocol called internet protocol.

3. Transport Layer

The transport layer allows peer entities on the source and destination hosts to exchange data with each other. The layer defines two end-to-end protocols namely TCP (Transmission Control Protocol) and UDP (User Datagram Protocol).

TCP is a reliable connection-oriented protocol and allows error-free transmission. At the source end, it segments the incoming byte stream into discrete messages and passes them to the internet layer. At the receiving end it groups the received messages into the output stream. It also handles flow control so that the fast sender does not overwhelm the slow receiver.

UDP is an unreliable connectionless protocol. Unlike TCP, it does not handle message sequencing and flow control. It is widely used in applications where prompt delivery is more important than accurate data, for example, speech and video.

4. Application Layer

The application layer defines all the higher-level protocols including TELNET, File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP) and Domain Name Service (DNS).

Figure (2) shows the initial protocols and networks defined in the TCP/IP model.

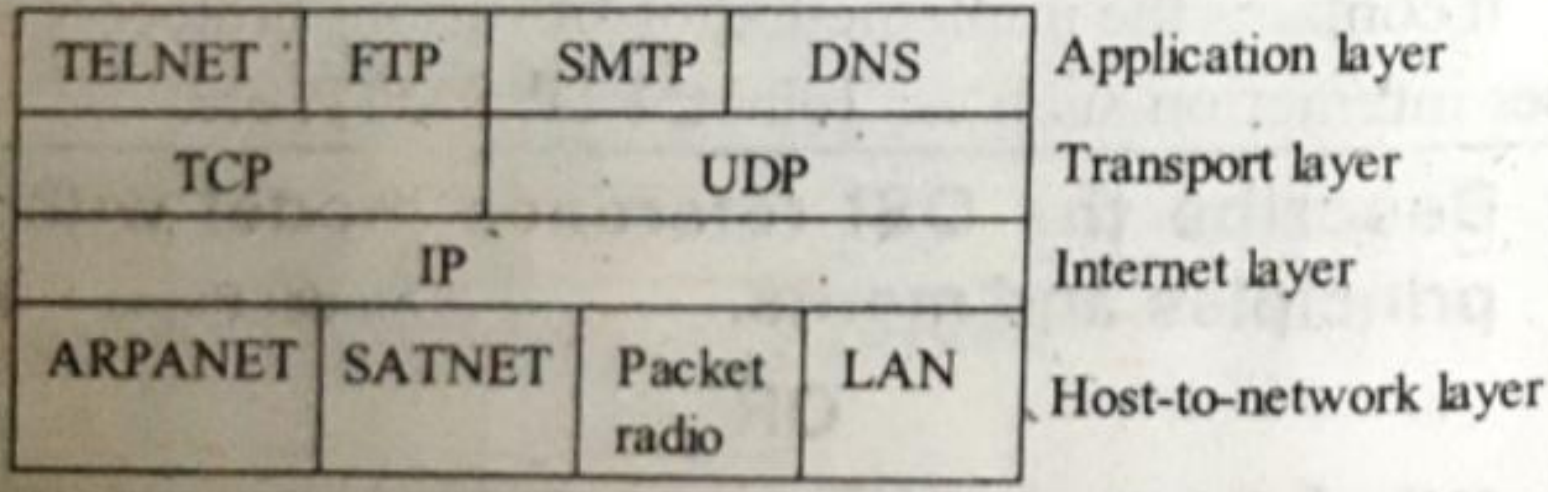

Figure (2): Protocols and Networks in TCP/IP Reference Model