TCP/IP MODEL

Introduction to **TCP/IP** Model

- The current Internet is based on a TCP/IP reference model.

- TCP and IP are two protocols of this model. TCP stands for Transmission Control Protocol and IP stands for Internet Protocol.

- The architecture or model was defined by the US department of defense and is used by ARPANET (Advanced Research Project Agency Network).
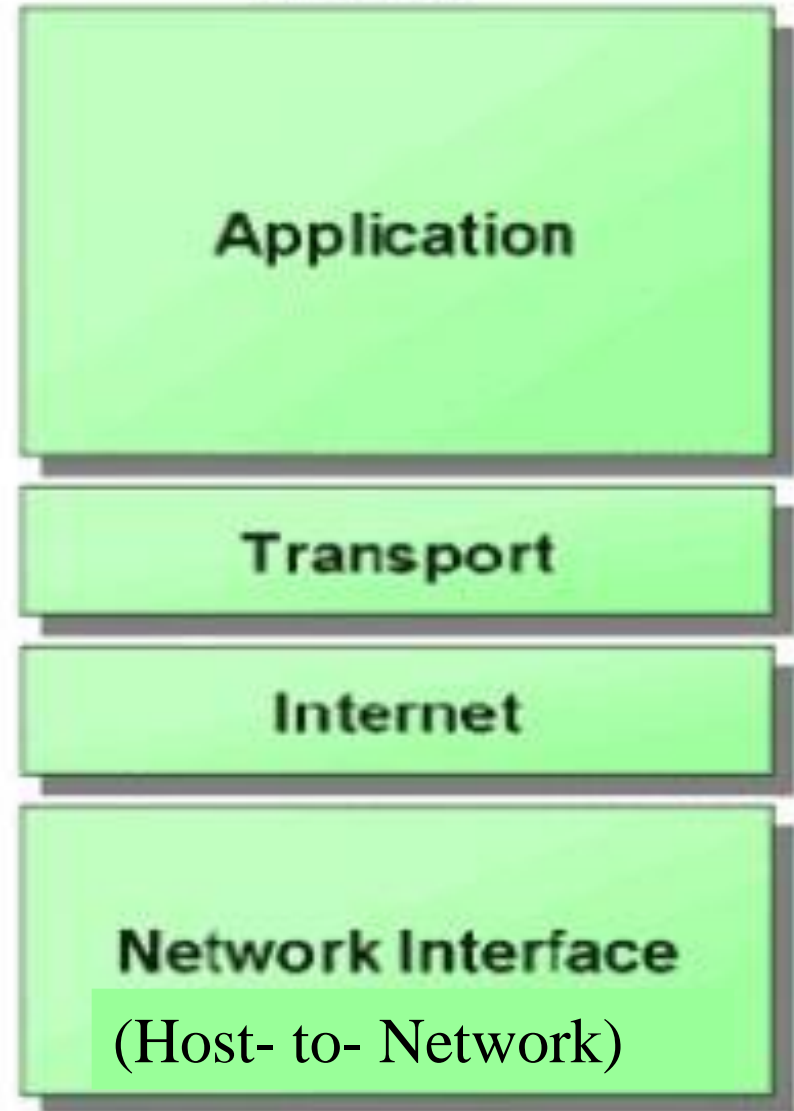
Goals on which TCP/IP model was designed:

- The network should connect multiple networks together.

- The connection should withstand till the source and destination machines are functioning.

- The architecture should be so flexible that it should be able to transfer data among different hardware or software platforms.

OSI Model

OSI Model	TCP/IP
Application	Application
Presentation	
Session	
Transport	Transport
Network	Internet
Data-link	Network Interface
Physical	(Host- to- Network)

TCP/IP and the OSI model

Host to Network Layer

- It is the bottom layer of TCP/IP model & lies below the internet layer.

- It is also known as Network Interface Layer.

- Function of this layer is to connect the host to the network & inform the upper layers so that they could start sending the data packets.

- This layer varies from network to network.

Internet Layer

- It is similar to Network Layer of OSI model in functionality.

- It allow the hosts to submit the packets to the network & Packets should travel independently using any possible route.

- The order in which the packets arrive at destination can be different from the order in which they were sent. In such cases it is the responsibility of higher layer to arrange these packets in proper order.

Functions of Internet Layer

- It keeps track of which layer receives the information.

- It translates the logical address to physical machine address.

- It breaks larger packets into smaller ones.

- It provides flow control & congestion control services.

Transport Layer

- It is similar in functionality to transport layer of OSI model.

- It allows the two processes on source & destination machines to communicate with each other.

- It divides the byte stream into messages.

- It handles the flow control so that a fast sender ahould not overflow a slow receiver.

- Transport Layer also provides two types of services: connection oriented & connectionless services.

- **Connection Oriented Services:** TCP (Transport Control Protocol is used for connection oriented services. By this the receiving devices sends an acknowledge back to the source after a packet is received.

Functions of TCP:

  - **Error Control:** Deliver byte stream from source to destination without error.

  - **Flow Control:** It prevents the source form sending data packets faster than the destination can handle.

  - It divides byte stream into small parts & pass it to internet layer on sender side & reassembles it into original byte at receiver side.

- **Connectionless Services:** UDP (User Datagram Protocol) is used for unreliable connectionless services. It does not sends an acknowledge back to the source. It is faster transmission method.

Function of UDP:

  o UDP is used for client-server type request queries & applications in which prompt delivery is more important than accurate delivery such as transmitting speech or video.

Application Layer

- It is the topmost of TCP/IP Model.

- It is responsible for data transfer between applications.

- It provides services such as e-mail, file transfer, access to the world wide web etc. to the user applications.

- It uses the protocols like FTP, SNTP & TELNET to transfer the data between applications

Functions of Application Layer

- **Mail Services:** It provides various e-mail services.

- **File transfer & Access:** It allows users to access files in a remote host, to retrieve files from remote computer for use etc.

- **Remote log-in:** A user can log into a remote computer and access the resources of that computer.

- **Accessing the World Wide Web:** Most common application today is the access of the World Wide Web.