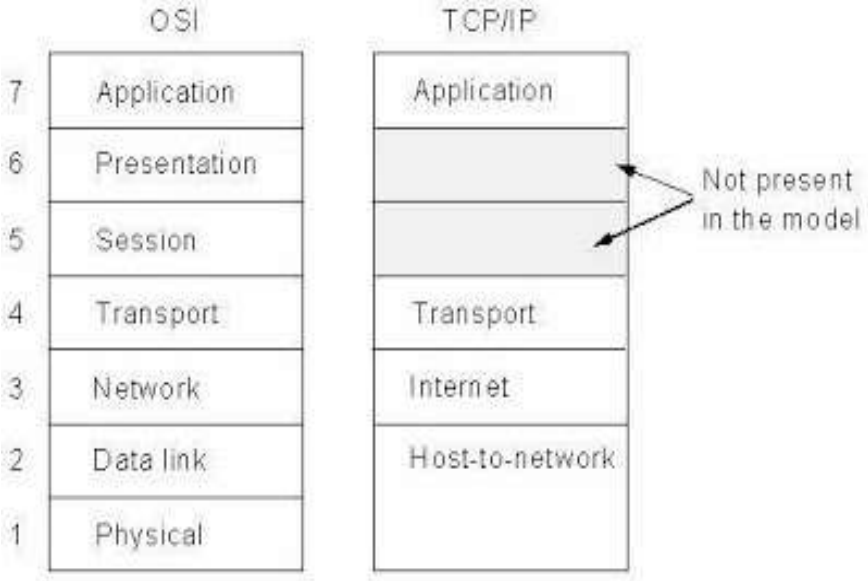
TCP/IP Reference Model

The TCP/IP reference model was developed by Department of Defence's Project Research Agency as a part of a research project of network interconnection to connect remote machines.



Below the Internet layer, the **Host-to-Network Layer** is there. The TCP/ IP reference model does not really say much about what happens here, except to point out that the host has to connect using some protocol so it can send IP packet over it. This protocol is not defined.

The **Internet Layer** is the key layer that holds the whole architecture together. Its job is to permit hosts to insert packets into any network and have them travel independently to the destination (potentially on a different network). Internet Protocol (IP) is the most important protocol in Internet Layer. It provides a routing function that attempts to deliver transmitted messages to their destination. A message unit in an IP network is called an IP datagram. This is the basic unit of information transmitted across TCP/IP networks.

The layer above the Internet layer in the TCP/ IP model is the **Transport Layer**. The design of this layer is to allow conversation of peer entities for both source and destination. Two end-to-end protocols have been defined here:

- TCP (Transmission Control Protocol): TCP is a reliable connection-oriented protocol that allows a byte stream originating on one machine to be delivered without error on any other machine in the internet. It fragments the incoming byte stream into discrete messages and passes each one onto the internet layer. At the destination, the receiving TCP process reassembles the received messages into the output stream. TCP also handles flow control.
- UDP (User Datagram Protocol): UDP is an unreliable, connectionless protocol for applications that do not want TCP's sequencing or flow control and wish to provide their own. It is also widely used for one/shot, client/server type request/ reply queries and applications in which prompt delivery is more important than accurate delivery.

The **Application Layer** is the topmost layer in the TCP/IP model. It is responsible for handling high-level protocols, issues of representation. This layer allows the user to interact with the application. When one application layer protocol wants to communicate with another application layer, it forwards its data to the transport layer.