



FACULTY OF ENGINEERING & TECHNOLOGY

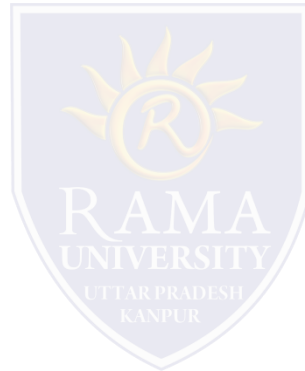
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Topics Covered

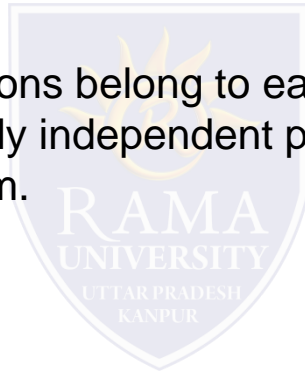
Comparison between OSI and TCP/IP Suite
Layers in the TCP/IP Suite
Physical Layer
Data Link Layer
Network Layer
Transport Layer



Comparison between OSI and TCP/IP Suite

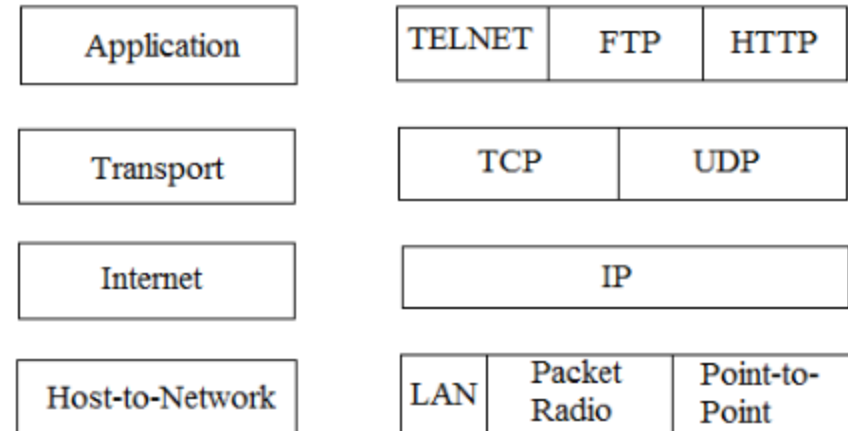
When we compare the two models, we find that two layers, session and presentation, are missing from the TCP/IP protocol. The application layer in the suite is usually considered to be the combination of three layers in the OSI model.

The OSI model specifies which functions belong to each of its layers but the layers of the TCP/IP protocol suite contain relatively independent protocols that can be mixed and matched, depending on the needs of the system.



Layers in the TCP/IP Suite

The four layers of the TCP/IP model are the host-to-network layer, internet/network layer, transport layer and the application layer. The purpose of each layer in the TCP/IP protocol suite is detailed below.

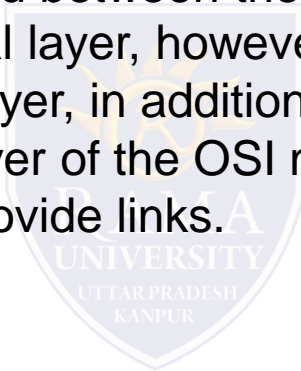


Physical Layer

TCP/IP does not define any specific protocol for the physical layer. It supports all of the standard and proprietary protocols.

- At this level, the communication is between two hops or nodes, either a computer or router. The unit of communication is a **single bit**.

- When the connection is established between the two nodes, a stream of bits is flowing between them. The physical layer, however, treats each bit individually. The responsibility of the physical layer, in addition to delivery of bits, matches with what mentioned for the physical layer of the OSI model, but it mostly depends on the underlying technologies that provide links.



Data Link Layer

TCP/IP does not define any specific protocol for the data link layer either. It supports all of the standard and proprietary protocols.

At this level also, the communication is between two hops or nodes. The unit of communication however, is a packet called a **frame**.

A **frame** is a packet that encapsulates the data received from the network layer with an added header and sometimes a trailer.

The head, among other communication information, includes the source and destination of frame.

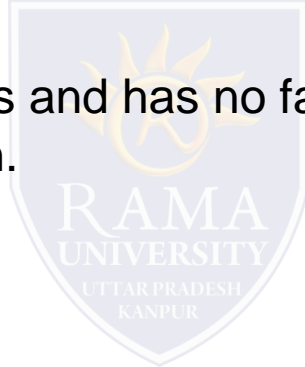
The **destination address** is needed to define the right recipient of the frame because many nodes may have been connected to the link.

The **source address** is needed for possible response or acknowledgment as may be required by some protocols.

Network Layer

At the network layer, TCP/IP supports the Internet Protocol (IP). The Internet Protocol (IP) is the transmission mechanism used by the TCP/IP protocols.

- IP transports data in packets called **datagrams**, each of which is transported separately.
 - Datagrams can travel along different routes and can arrive out of sequence or be duplicated.
- IP does not keep track of the routes and has no facility for reordering datagrams once they arrive at their destination.



Transport Layer

The network layer is responsible for sending individual datagrams from computer A to computer B; the transport layer is responsible for delivering the whole message, which is called a **segment**, from A to B.

A segment may consist of a few or tens of **datagrams**. The segments need to be broken into datagrams and each datagram has to be delivered to the network layer for transmission.

Since the Internet defines a different route for each datagram, the datagrams may arrive out of order and may be lost.

The transport layer at computer B needs to wait until all of these datagrams to arrive, assemble them and make a segment out of them.

