

TCP /IP Layers

Wednesday, August 17, 2022

6:58 PM

The ISO - International Organization for Standardization developed something called the OSI Model in early 1990s to bring in uniformity with respect to networking because each company had its own networking model which made it difficult for different devices to communicate. For the TCP / IP model that we are talking about today.

Developed by a lot of volunteers and the United States Department Of Defense to connect the internet and communicate seamlessly.

Each Layer in the TCP/IP Model helps the layer which is on top of it. For instance, the Application layer and so on..

Application Layer: Helps your web browser to communicate with the network. The main protocol for this layer, HTTP allows your web browser to communicate with the server because of HTTP.

Transport Layer: Has two main protocols:
Transmission Control Protocol(TCP) and *The User Datagram Protocol (UDP)*

TCP uses something called as ACK (Acknowledgements) to ensure that data is received. It uses SEQ (Sequence) numbers and ACK to ensure that the data is delivered correctly. It will perform the error recovery which makes it easier for data delivery.

Network Layer: While the Application Layer and the Transport Layer deal with the client, the network layer ensures the data is being sent to the right client. Next in the stack it follows - **I**(Internet)**P**(protocol). This protocol defines that each device has a unique IP address which is in the form of a Dotted - Decimal Notation.

ing called an OSI (Open Systems Interconnection) model. Before this period, multiple vendors had their own protocols to communicate. ISO built the OSI model which is the base

case, TCP / IP is the reason we are able to connect to

instance, the transport layer helps the Application

work and process the requests. HTTP is the best protocol for the network. Accessing web pages is streamlined

UDP) which help in easy transmission of the data.

data is delivered in the order in which it is sent. It uses sequence numbers. If a segment is lost, it is retransmitted. If the TCP segment gets dropped, TCP

about sending the proper data from server to the client. The Network Layer has the very important protocol which is IP. Any device that uses TCP /IP must have a unique address called

the IP address which is in the form of a **Dotted - Decimal Notation**.

Data Link Layer and Physical Layer: They work very closely to physical. The IP Packet is Encapsulated into a Ethernet Frame and the data bits are de where the destination router de-encapsulates the IP Packet and the transmiss wireless LAN protocols to help in transmitting the data.

The term encapsulation refers to the process of putting headers (and sometimes trailers) around the data. In each layer, each layer adds its own headers to the data supplied by the layer above. The message is called a Protocol Data Unit (PDU) in each segment since it encapsulates some of its own protocol values to transmit. The message is called a Protocol Data Unit (PDU) in each segment since it encapsulates or what the message is called in each layer:

APPLICATION DATA - APPLICATION LAYER

SEGMENT- TRANSPORT LAYER

PACKET- NETWORK LAYER

FRAMES- DATALINK LAYER

BITS- PHYSICAL LAYER

While TCP / IP has different names for the messages in each layer, the OSI model has a common name for the messages in each layer, the **PROTOCOL DATA UNIT**. The OSI model had Layer 2 - Layer 7 PDU.

lly deliver the data from Source IP to Destination IP.
livered via the electric cables to the destination
sion is done. The link layer has all the ethernet and

mes trailers) around some data. When sending data
data that is being carried has different terminology
nsmit the data, below is what each layer

model called everything a PDU which means