**ALL ABOUT OSI AND TCP/IP**

**SIMILARITY BETWEEN TCP/IP AND OSI**

* In both models, a single layer defines a particular functionality and sets standards for that functionality only.
* Both are logical models
* Both define standards for networking
* Both provide a framework for creating and implementing networking standards and devices.
* Both divide the network communication process into layers.

**Difference between tcp/ip and osi**

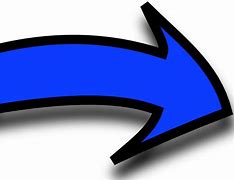
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| Expands To | Transmission Control Protocol/ Internet Protocol | Open system Interconnect |
| Meaning | It is a client server model used for transmission of data over the internet. | It is a theoretical model which is used for computing system. |
| Number Of Layers | 4 Layers | 7 Layers |
| Developed by | Department of Defense (DoD) | ISO (International Standard Organization) |
| Tangible | Yes | No |
| Usage | Mostly used | Never used |
| Obeys | Horizontal approach | Vertical approach |

**TCP/IP Model Layers**

1. **Network Interface Layer**: This layer acts as an interface between hosts and transmission links and used for transmitting datagrams. It also specifies what operation must be performed by links like serial link and classic ethernet to fulfil the requirements of the connectionless internet layer.
2. **Internet Layer:** The purpose of this layer is to transmit an independent packet into any network which travels to the destination (might be residing in a different network). It includes the IP (Internet Protocol), ICMP (Internet Control Message Protocol) and ARP (Address Resolution Protocol) as the standard packet format for the layer.
3. **Transport Layer**: It enables a fault-free end-to-end delivery of the data between the source and destination hosts in the form of datagrams. The protocols defined by this layer are TCP (Transmission Control Protocol) and UDP (User Datagram Protocol).
4. **Application Layer**: This layer permits users to access the services of global or private internet. The various protocols described in this layer are virtual terminal (TELNET), electronic mail (SMTP) and file transfer (FTP). Some additional protocols like DNS (Domain Name System), HTTP (Hypertext Transfer Protocol) and RTP (Real-time Transport Protocol). The working of this layer is a combination of application, presentation and session layer of the OSI model.

**The seven layers of OSI model are:**

1. **Application Layer**: With this layer, the users can access the network by using interfaces and services like electronic mail, shared database management, file access/transfer and the other services.
2. **Presentation Layer**: Presentation layer focuses on the syntax and semantics of the transmitting information. It performs tasks such as translation, encryption and compression where the actual information existing in the form of character strings, numbers, symbols is encoded into bit streams, converted into another form and compressed.
3. **Session Layer**: This layer establishes the session between different machines in order to synchronize and maintain the interaction between them. The services provided by the session layer are dialog control, token management and synchronization.
4. **Transport Layer**: It accepts the data from its preceding layer in the form of independent packets and transmits it to the succeeding layer in proper order. The other function carried out by this layer are service point addressing, connection control, segmentation and reassembly, flow control and error control.
5. **Network Layer**: Logical addressing and routing are the major operations performed by the network layer. It translates the network logical address into physical MAC address so that the two systems residing in the different networks could also communicate efficiently. A packet also requires a path to be followed to reach at the destination avoiding congestion and failed components, so it also facilitates the automatic updation of the routes.
6. **Data Link Layer**: It is responsible for transforming the raw transmission service (Physical layer) into a reliable link. It makes the physical layer free from error by masking them so that the network layer does not notice them. In this layer, the input data is split into frames. The tasks carried out in the data link layer are framing, access control, physical addressing, error and flow control.
7. **Physical Layer**: It transmits the individual bits over the transmission channel. The physical layer deals with the description of the characteristics of the interface between the devices and the transmission media, representation of bits, synchronization of the bits, data rate, physical topology, line configuration, transmission mode.

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