

Osi model

[Technology](#), [Internet](#)



The OSI (Open Systems Interconnection) is a standard description or "reference model" used in the networking industry to explain the process of information exchange and transmission between two points in a telecommunication network. The OSI Model highlights the process of communication in seven layers. Products manufactured for telecommunications purposes have followed this model making it a valuable reference of communication that gives a common ground for understanding data communication. The OSI Model is a guide to the computer and it directs it on how to handle data that is received and how to handle data that is supposed to be sent.

Purpose The OSI Model helps to create a standard procedure that is to be used in facilitating communication between machines. There are different hardware architectures and different software platforms and they may all have different needs for them to facilitate communication between two machines. This is a reason why a standard communication platform became necessary. The OSI Model enables the communication process to be free of disparities in the hardware and software platform (firewall. cx, 2010). The OSI Model is also important in guiding networking product manufacturers in their processes.

It gives them a guide in how to produce products that are compatible with other products. The OSI Model development has played a considerable significant role in enabling the growth of the networking industry (The Certification Hub, 2010). **Scope of Work** The layers of the OSI model: The OSI Model is divided to seven layers. The four upper layers pass messages or communication from or to a user and the lower three are responsible in

passing messages through the host computer. If the messages are destined to the host they are passed to the upper layers but if they are destined to other host computers they are forwarded to the other hosts.

The seven layers are described from the highest to the lowest as follows: The application layer is the first and also known as Layer 7. This is the layer at which the user interface is placed and the user interacts with the application. It is in this layer that quality of service is rated and security issue is considered. It is in this layer that functions needed by user are placed for example remote file access, network management and electronic messaging. Data and information from this layer is passed on to the presentation layer.

The following layer is called the presentation layer or Layer 6. In this layer there is coordination and cooperation in the execution of operations with the operating system. In order to convert incoming and outgoing data from one required format to another for example, from a coded stream of information into a function or action to be carried out by the machine or user. This level is basically defining the communication process and requirement. This layer provides character code translation, encryption, data conversion and compression (firewall. cx, 2010).

In the next layer which is the fifth or the session layer is a one stop point for several activities. It is responsible for setting up, coordinates, and terminates communication and information exchanges. It sums up every dialog between the applications at each end. It gives sessions in which there connection and halts the connection. This coordination involves preparing messages from both sides for posting on either side. The services provided in the sessions

established include logging in and name recognition. Layer 4 which is the transport layer manages the end-to-end control.

It breaks down the bundles of messages into segments. The segments are transmitted one at a time and the TCP header is added onto the segments. Error-checking is done before data transfer and ensures there is no duplication or loss. This layer also provides message traffic control when there are no message buffers available (Gountanis, 2008). It can also handle messages from several sessions or streams and keep track of messages which belong to which session. In Layer 3 the network layer handles the routing of the data and determining the physical path the data should follow.

It ensures data goes to the right direction and destination when transmitted and receives incoming transmissions. This is possible because of the ability to translate logical addresses to physical addresses It also determines the services to be given priority in the delivering and receiving of messages. The network layer does routing and forwarding by managing the subnet account. Layer 2 also known as the data-link layer ensures error free transfer of data frames from one node to another. It is also in this layer where establishment and termination of logical link between two nodes is determined.

It describes the logical organization of data bits transmitted on a given medium. This means it manages the transmission process from one node to another (Gountanis, 2008). The first Layer is the physical layer and its major duty is to deliver the unstructured bit stream through the network at the electrical level using the medium of communication in place. It defines the interface on which transmission takes place whether electrical or optical. The

hardware means of sending and receiving data provide the data encoding services, and transmission technique whether digital or analogue.

The well structured stages in which data undergoes in the communication process through the OSI Model enables the communication between different hosts of different architecture. The communication process is successful when the user is able to send and receive the right information in the right time and the stages of this model are well arranged to endure this (The Certification Hub, 2010). The hardware units also enjoy the presence of this model since it simplifies the communication process. Benefits of the OSI Model The established standards of communicating are very vital to both the manufacturer and the consumer.

The process of finding the required Software and hardware for networking platform is simplified as any machine which follows this model is able to communicate with other devices that follow the standards. It is also independent of country of origin of hardware products and software. The operating system used is also not a problem as it is compatible. The OSI Model is divided in different stages thus they have different protocols. They are defined at every stage and thus ensure errors are handled at each stage. This model can run automatically in every stage (firewall.

cx, 2010). The DOD Model This is a four layered model compared to the seven layered OSI Model. It was developed back in the days when mainframe computers run different proprietary software. This meant that machines with different operating systems and different manufacturer could not communicate or exchange data. Thereafter a network model was created to enable users to exchange data between computer systems over a wide area

network (WAN). This is what is known as the Department of Defence (DOD) network model (Gountanis, 2008).

It is divided into four layers as follows: The Network Access Layer which is can be compared to layer one and two of the OSI Model. It is responsible for delivering data over the particular hardware media in use. Different protocols are selected from this layer, depending on the type of network technology. The Internet Layer is responsible for the packaging, addressing, and routing of data across a series of different physical networks that interconnect a source data and the destination address. This layer can be compared to the network layer of the OSI Model.

Routing protocols are used in this layer for the purpose of message delivery as well as the IP Protocol and the Internet's fundamental protocol. The Host-to-Host Layer functions similarly to the Transport layer of the OSI model. It handles connection the communication channels between the Application layer and the lower layers. The layer makes use of TCP and UDP protocols but TCP is more reliable since it sends the data and can receive verification that the data was actually delivered (Gountanis, 2008). The Process Layer or the Application layer is similar to the Session layer, Presentation layer, and Application layer of the OSI model.

It contains protocols that enable communication between different applications and also provide access to services such as mail delivery, file transfer and remote login at the lower level of the DOD Model. Protocols These are a set of rules that govern the way the computer communicates and they also determine format, timing, sequencing, and error control. The example of protocols in use is TCP which stands for the Transport Control

Protocol. It converts the remote machine name from NETBIOS name to IP address in the Network layer.

some machines have internally stored protocols of exchanging information depending on the operating system for example a Novell network communicates using its own protocol called IPX/SPX whereas Microsoft uses the NetBEUI protocol to exchange information. The TCP/IP set of protocols govern the way communication is carried out across networks. Under the TCP/IP protocols there is the HTTP which stands for Hyper Text Transfer Protocol. It is important when the client wants to contact the server and vice versa. Protocols are observed everywhere and they observe order in the communication of machines (The Certification Hub, 2010).

Encapsulation and De- Capsulation The communication process between the layers entails the passing of information from the top layers to the lower layers. When the messages are passed to the lower layers headers and footers are added to the messages. It is called encapsulation. The header can be called a wrapper. The reverse process is called “ decapsulation” because when a message moves from the bottom to the top layers it is first stripped off the headers and the inner part is passed up (Gountanis, 2008).

Summary The OSI Model and DOD Model are both models used in data communication.

The background and basis of the two models are similar and it is evident that the DOD Model process of passing messages across the different layers has a lot of similarity to the OSI Model. The OSI Model is commonly used because of its reliability and flexibility. It is designed in a way to fit on any platform and work on any architecture. This makes it the preferred networking model

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among networking professionals. The DOD Model is hindered by its inability to fit on a variety of software platforms or Hardware Architecture. Conclusion OSI Model gives a systematic flow of messages and information in seven layers.

The OSI model is divided into two parts of operation. The upper layers and the lower layers; the upper layers of the OSI model is linked to application issues and is implemented only in software. The highest layer is the application layer which allows interaction with user. The lower layers of the OSI model are linked to data transport issues. The physical layer and the data link layer require hardware and software platforms to implement. The physical layer is closest to the network peripherals such as the network cables. It is responsible for feeding data on the communication medium.