

Term Paper Proposal

OSI MODEL

ABSTRACT:

In the initial days of computer networking, vendors created their own networking models to support their products. The main problem with this model was that they allowed communication between the systems that were manufactured by same retailer. With this communication between two devices is not possible if they are manufactured by two different vendors. To eliminate this problem International Organization for standardization created OSI model. With this model data can be transferred to any kind of network irrespective of manufacturer. This model provides safe and secure communication or transferring of files between devices. This paper explains about OSI model and how each layer of this helps in communication between devices of different networks.

INTRODUCTION:

The main aim of this paper is to know how OSI model helped computer networks to resolve communication problem and how seven layers of this model helps for safe and secure data transmission. The word networking is evolved from the basic principle of moving data from one computer to another computer. In the initial days, data transferring between networks is done using storage media such as floppy disks. As efficient means are developed, networking became more popular. OSI model standardizes network protocols, which makes communication across devices much easier. OSI model creates one single platform for developers and manufacturers that helps to create networking products that can communicate with one another over the network.

The OSI model breaks the communication system into seven layers: Physical Layer, Data Link Layer, Network Layer, Transport Layer, Session layer, Presentation Layer and Application layers. In which, Data Link Layer has two sublayers which are Logical Link Control (LLC) and Media Access Control (MAC). Application layer has two sublayers which are Common Application Service Element (CASE) and Specific Application Service Element (SASE).

- **Physical layer:** This is a hardware layer. The fundamental role of this layer is handling voltages, connectors, switches and electrical pulses so that data can be transmitted from one network to another. This layer contains data in the form of bits. When this layer receives information, it converts it into 0's and 1's and send to the data Link layer. The

functions of physical layer are Bit rate control, bit synchronization, physical topologies, transmission mode.

- **Data Link Layer:** The data link layer is divided into two parts Logical Link Control and Medium Access Control. The functions of this layer are physical transfer, framing, flow control, error control and error-control functions over a single transmission link. It is responsible for node-to-node delivery of information. The main aim of this layer is to transfer error free data.
- **Network Layer:** The third layer of OSI model is network layer. It is responsible for transmission of message from one host to other host located in different networks. It is the network address translation into physical address. The header of network layer holds sender and receiver IP address. This layer is also responsible for transmitting the packets in shortest path among the number of routes available. The functions of network layer are routing and logical addressing.
- **Transport Layer:** The transport layer is responsible for end-to-end delivery of message and ensures whether data transmission is successful or not. It re-transmits data if any error is detected. Here data is referred as segments. This layer acts as interface between top and bottom layers. It communicates with application layer by making system calls. The functions of transport layer are Segmentation and reassembly, service point addressing. This layer provides both connection oriented and connection less services. It is a part of operating system and is called as heart of osi model.
- **Session layer:** Session layer is responsible for session establishment, session maintenance, session termination, synchronization and digital controller. It clears up communication channel between two communicating networks. This layer inserts check points in the data to accomplish data synchronization. Session layer allows two-way transmission of information at the same time.
- **Presentation Layer:** It is also called as Translation layer. Data from application layer is extracted and manipulated as per the required format to transmit over the network. The functions of this layer are translation, encryption/Decryption and compression.
- **Application Layer:** This is the topmost layer of OSI model. It is also called as desktop layer. Functions of this layer are opening, closing, writing and reading files, transferring files, executing remote jobs, email. It provides interface between computer software and network.

DISCUSSION:

In this model, each layer provides a different and additional protection to provide solutions and prevention to security issues and risks associated with manipulation, data intervention, destruction. All layers work together in an order to move data around a network. OSI architecture gives an idea how packets move over network during data transmission. This model reduces complications. It is the first standard model for network communications and got adopted by major computer companies.

ANALYSIS:

OSI model breaks the network communication into smaller components to make component development, design and learning easier. OSI model sends error-free data. In this model changes made in one layer does not affect other layers. The main purpose of OSI reference model is to promote a clear framework that describes the functions of networking or telecommunications system. OSI model plays a major role in security issues and provides solutions. OSI model describes every function and protocol in detail. All these things

CONCLUSION:

This paper explains about how OSI model helps in secure, error free data transfer by using its seven layers. And, how it helped to solve the problem of communication between devices of different manufacturers. This paper also explained function of each layer. Most vendors try to describe their products in relation to OSI model. Technology vendors and developers mostly uses the OSI model.

REFERENCES:

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