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OSI MODEL

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ABSTRACT
The International Standards Organization (ISO) established in 1947 is a multinational body dedicated to worldwide agreement on international standards. An ISO standard is the Open Systems Interconnection (OSI) model which was first introduced in the late 1970s. This model is the highest level of abstraction in the OSI scheme. This paper describes briefly about the OSI Model. Then it tells about the various layers of OSI Reference Model present in its layered framework.

KEYWORDS:ISO standards; layered framework; hop; session; encryption

INTRODUCTION
The OSI model is an open system which is a set of protocols that allows any two different systems to communicate regardless of their underlying architecture. The purpose of OSI model is to show how to facilitate communication between their systems without requiring changes to the logic of the underlying hardware and software.

It is important to know that ISO is an organization and OSI is the model. The OSI model is a layered framework for the designing of network systems which allows communication between all types of computer systems. It consists of 7 separate layers but they are somewhere related, each of which defines a part of the process of moving information across a network.

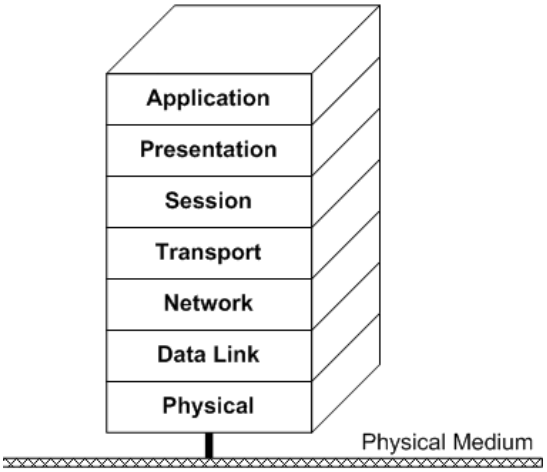

Fig: Seven layers of OSI model

The seven layers can be set to belong from 3subgroups. Layers 1,2 and 3-physical, data link, network-are the network support layers; which deals with the physical aspect of moving data from one device to another. Layers 5,6 and 7-session, presentation and application-can be though as the support layers; which allows interoperability among unrelated software systems. Layer 4, transport layer, links these 2 subgroups and ensures that what the lower layers have transmitted is in a form that the upper layers can use.

LAYERS OF THE OSI MODEL

1. Physical Layer

It is the layer which is responsible for movements of individual bits from one hop (node) to the next. The physical layer coordinates the functions required to carry a bit stream over a physical medium. It handles the

mechanical and electrical specifications of the interface and transmission medium. It describes about the different procedures and functions that a physical device and interface have to perform for the transmission.
The physical layer is also concerned about the following:

- Transmission mode
- Data rate
- Synchronization of bits
- Representation of bits
- Line configuration
- Physical topology
- Physical characteristics of interfaces and medium

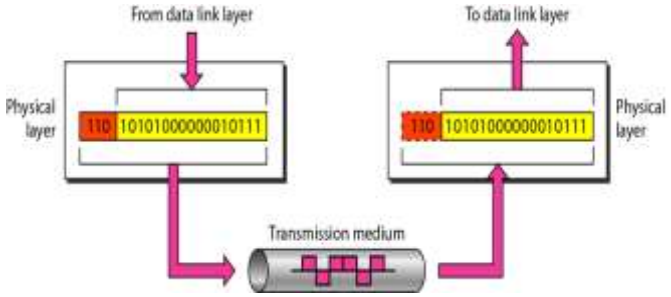

Fig: Physical Layer

2. Data Link Layer

It is the layer which is responsible for moving frames from one hop (node) to the next. The data link layer transforms the physical layer, a raw transmission facility, to a reliable link. It makes the physical layer appear error-free to the upper layer (network layer).

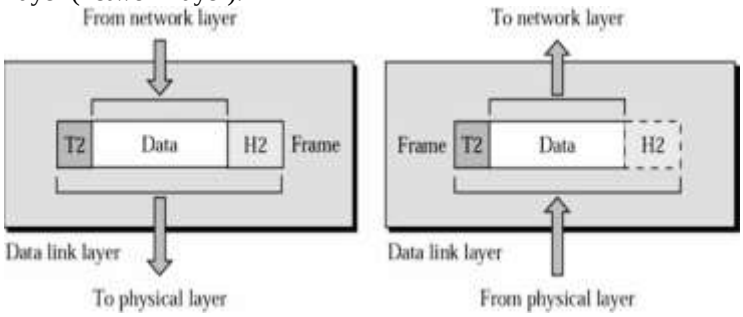

Fig: Data link Layer

There are also other responsibilities regarding data link layer which includes the following:

- Error control
- Physical addressing
- Flow control
- Access control
- Framing

3. NETWORK LAYER

It is the layer which is responsible for the delivery of individual packets from the source host to the destination host. In other words, the network layer is responsible for the source-to-destination delivery of a packet, possibly across multiple networks.
If two systems are connected to the same link, there is no need for a network layer. But, if the 2 systems are connected to different links with connecting devices between the networks, then there is a need for the network layer to accomplish source-to-destination delivery.
Some of the other responsibilities of the network layer include the following:

- Logical addressing
- Routing

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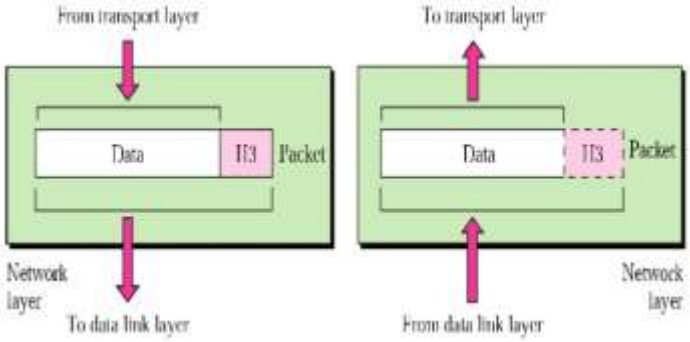

Fig: Network Layer

4. TRANSPORT LAYER

It is the layer which is responsible for the delivery of a message from one process to another. In other words, the transport layer is responsible for process-to-process delivery of the entire message. While the network layer oversees source-to-destination delivery of individual packets, it does not recognize any relationship between those packets. A process can be said as an application program running on a host. The transport layer ensures that the whole message arrives intact and in order, looking at both eeror and flow control at the source-to-destination level.

Some of the other responsibilities of the transport layer include the following:

- Flow control
- Service-point addressing
- Segmentation and reassembly
- Error control
- Connection control

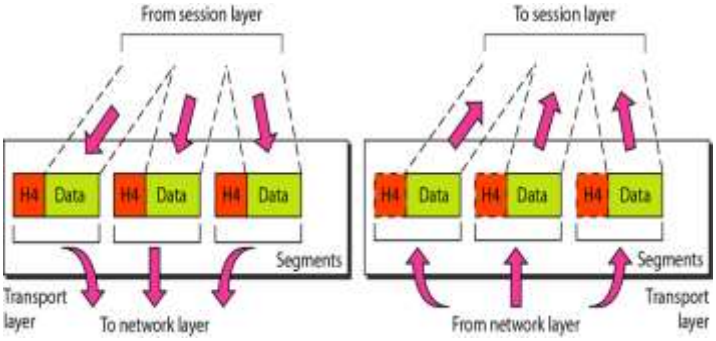

Fig: Transport Layer

5. SESSION LAYER

It is the layer which is responsible for dialog control and synchronization.

The services provided by the 1st three layers are not sufficient for some processes. The session layer is the network dialog controller. It can establish, maintain and synchronize the interaction among communicating systems.

Specific responsibilities of the session layer include the following:

- Synchronization
- Dialog control

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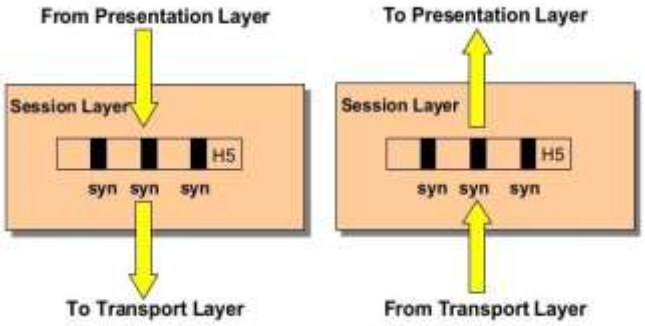

Fig: Transport Layer

6. PRESENTATION LAYER

It is the layer which is responsible for translation, compression and encryption. This layer is concerned with the syntax and semantics of the information exchanged between the two systems.

Specific responsibilities of the presentation layer include the following:

- Translation: Encoding of information into bit streams to be transmitted.
- Encryption: Transformation of original information to another form by the sender.
- Compression: Reduces the number of bits contained in information.

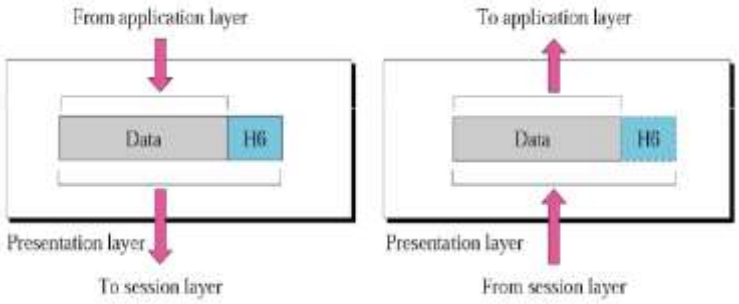

Fig: Presentation Layer

7. APPLICATION LAYER

It is the layer which is responsible for providing required services to the user. The application layer enables the user (human or program) to access the network. It provides user interfaces and support for services such as remote file access and transfer, e-mail, shared database management etc.

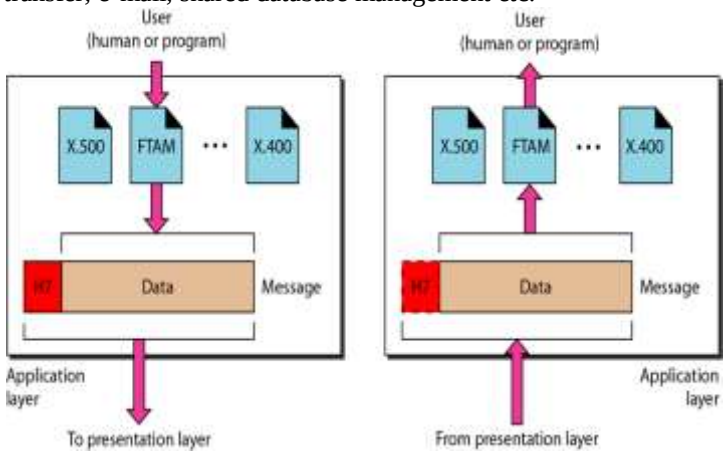

Fig: Application Layer

The services provided by the application layer include the following:

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- File transfer, management and access
- Directory services
- Network virtual terminal

CONCLUSIONS

The *International Standards Organization's* intention in creating the OSI model wasn't to describe every network but to give protocol designers a map to follow to aid in design. This model is useful for conceptualizing network components to describe and show how they fit together to help the computers within the network to communicate. The OSI reference model was formulated as a template for the structure of communications systems. It was not intended that there should be standard protocols associated with each layer. Instead, a number of different protocols have been developed each offering a different functionality. There are three major international organizations developing standards and protocols for communications including:

- International Standards Organization (ISO)
- American Institute of Electrical Engineers (IEEE)
- International Telecommunications Union – Telecommunications Sector (ITU-T)

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