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Open Systems Interconnection model Seven Layers of Computer Networks

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Abstract: The open System Interconnection show interconnection endeavors at the International Organization a correspondences framework into littler parts called layers. A layer is an accumulation of theoretically comparable capacities that give administrations to the layer above it and gets administrations from the layer underneath it. On every layer an occasion gives administrations to the cases at the layer above and demands benefit from the layer underneath. For instance, a layer that gives blunder free correspondences over a system gives the way required by applications above it, while it calls the following lower.

Key word- OSI model, computer architecture, ARPANET.

I. INTRODUCTION

Working on the computer architecture open system international started OSI framework. This model is having two major components one is abstraction level of networking, called the basic reference Model. For the first time the basic reference model was proposed Charles Bachman. Some layers of this model design evolved from experiences with the ARPANET. In each layer object implement its function. Every object is related with the layer which is above and beneath. When Protocol is enabled in one object then correspondingly it communicates with the same layer in another host.
This approach was developed to address the following goals:

- Division of big and complex networks into smaller due to that which is easily managable.
- Giving suitable way or interface between network functions and modules.
- Providing easy language that every one can understand it.

In the improvement of this model was to gathering same capacities into layers, while keeping every layer sufficiently little to be very much mainted and sensible, when we keep the quantity of layers little, since an extensive number of layers may expand the preparing overhead. The accompanying principals are utilized for characterizing the model.

1. The number of layers should not be so many as to make the task of describing difficult.

2. Every Layer should have some boundaries that could be made at points where the description of

3. services is small and the number of interactions between boundaries is minimized.

4. Separate layers should be created in cases where manifestly different functions are performed or different technologies are involved.

5. Same functions should be collected into the same layer.

6. A layer should be created where functions are easily localized.

7. A layer should be created where there is a need for a different level of abstraction in the handling of data.

8. Changes of functions or protocols of a layer should be made without affecting other layers.

9. Every layer should be having some boundaries with its upper and lower layers only are made.

II. DESCRIPTION OF OSI LAYERS

Service data unit is a data that is passed down from one layer to the next-lower layer, and which the lower layer divided into protocol data unit. Layer N-1 adds a header or footer, or both, to the service data unit, composing layer N-1.

Layer 1: physical layer

In this layer the hardware communicates direct with the wire, cable or any medium that us between the hardware and software .

- The protocol is established between the two nodes or workstations.
- This layer define the protocols for flow in communications.

Layer 2: Data Link Layer

Data link layer is the second layer in the OSI Model. This layer has the only functionality that transfers data from one node to another work stations. If the node is connected to a Wireless medium or Local area network. And data is transferred in the form of frames. When we perform and implement the cyclic redundancy check due to that we can check the error detection. Data link layer also provide reliable transmission.

Layer 3: Network Layer

In this layer the main function is logical addressing. Through logical addressing the layer provides which in turn helps them to find their paths. This layer also provides the functional means of transferring data sequence called data grams.
Key network layer functions are as under

1. Forwarding
2. Routing

In figure 1 the Network layer is explained in detailed

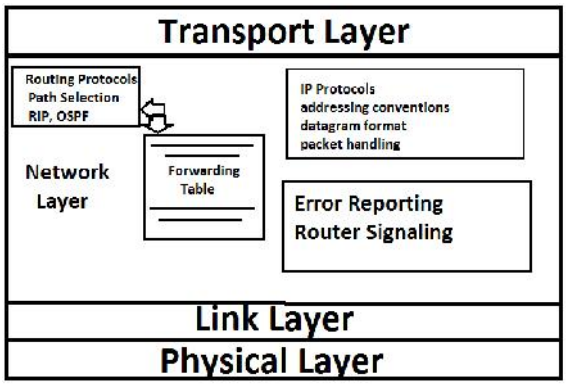

Figure: 1

Layer 4: Transport Layer

The vehicle level gives end-to-end correspondence between procedures executing on various machines. Despite the fact that the administrations gave by a vehicle convention are like those gave by an information connect layer convention, there are a few essential contrasts between the vehicle and lower layers:

1. User: Application software engineers communicate specifically with the vehicle layer, and from the developers viewpoint, the vehicle layer is the ``network''. Along these lines, the vehicle layer ought to be situated more towards client administrations than essentially reflect what the basic layers happen to give.

2. Negotiation of Quality: The client and transport convention may need to consult with regards to the nature of administration to be given. Client might need to arrange such alternatives as: throughput, postponement, insurance, need, unwavering quality, and so forth.

3. Service: The vehicle layer may need to defeat benefit lacks of the lower layers (e.g. giving solid administration over a temperamental system layer).

Layer 5: Session Layer

This layer allows two nodes to hold ongoing messaging called a session. This is the thinnest layer in the OSI model. The applications on either end of the session can exchange data. The session layer handles session setup, data or message exchanges, and tears down when the session ends. The session layer along with the presentation layer add services to the transport layer that are likely to be of use to applications, so that each application doesn't have to

provide its own implementation. A session can be used to allow a user to log into a remote time-sharing system or transfer a file between two machines.

The session layer is having the following services:

- Dialogue Management
- Synchronization
- Exception Handling
- Procedure Call

Layer 6: Presentation Layer

This layer is concerned with the meaning of information across the network. This layer represent the data in many ways like data compression and encryption. This layer having concerns with the following issues:

Data Format: Converting the complex data structures used by the application like strings, integers, structures etc into a byte stream transmitted across the network.

Data compression: like to reduce the amount of transmitted data. For example to save money.

Layer 7: Application Layer

Application layer gives us some services like email, web, instant messaging, Remote login, Multi user network games, Streaming video clips, Internet telephone. This layer having some protocols which are as follow:

1. HTTP (Hyper text transfer protocol)
2. FTP (File transfer protocol)
3. SMTP (Simple mail transfer protocol)
4. DNS (Domain name system)

III. BENEFITS OF THE OSI MODEL

We can separate the Computer networks communications into logical pieces, this model simplifies how computer network protocols are designed. Through this model we can manufacture different type of equipments like hubs, computer routers and adapters etc.

IV. CONCLUSION

In this paper we have explained what exactly an Open System International model is, why and when it is used. This model is an structure which gives us an idea how packets transfer over the computer networks. In future we can use this model in security as well in other fields.

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