Software Model of "OSI" Layered Architecture

Syed Irfan Yaqoob, N.Priya
Department of computer science.
Bharath institute of higher education & research Chennai INDIA.
Syedirfan2003@gmail.com
shivaPriyamari@gmail.com

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Abstract— **To address the problem of networks being incompatible and unable to communicate with each other, the International Organisation for Standardisation (ISO) created a network model called OSI model. This paper is proposed to develop the software model of the OSI layered architecture. Each layer has been shown along with the standard protocols in a desktop application by using programming language Java. This initiative will aid academicians and networking professionals to understand and even to reuse or customize the protocol algorithms. The animation aids will be also provided to understand the communication in a best way. To transform the conceptual model into a complete OSI simulation model.**

Keywords ----OSI Model, Architecture, Simulation Model

Open source software.

I. INTRODUCTION

OSI (Open Systems Interconnection) is a model and a set of standard descriptions for the communication between two systems on different networks ,initially it was difficult to let the communication happen on the two different networks due to software or hardware incompatibility ,the International organizations for standardization (ISO) created a model called Open system interconnection model which describes how messages should be transmitted between any two systems in a communication network. Its purpose is to make the different hardware and software's to communicate with each other without any incompatibility. This model defines seven layers of that take place at each end of a communication. The OSI model helps the vendors to create interoperable network implementations. The OSI model communicates through seven different layers between computers over a network. This is commonly known as layering. Aim of this paper is to develop the software model of the OSI layered architecture. Each layer has been shown and designed along with the standard protocols. This initiative will aid academicians and networking professionals to understand and even to reuse or customize the protocol algorithms. Its

animated version will help the learners to learn the OSI model in a practical way.

II. RELATED WORK

While the research work is very rich with experiences in applied OSI reference Model in the computer networking, but none have addressed the challenge of Simulating OSI Layered Architecture in computer networking.
Here is some related work:-

1. Teaching Computer Networks Through Modelling (Paper) This paper was presented by the Army person: Capt.Davis,Scot & Lt.Col. Drew Hamilton Electrical Engineering and Computers dpt. United States Military Academy ,West Point, New York 10996 ,it was the first ever attempt to explain OSI model into detail by providing some sort of slides ,who represent the OSI layers in a fashion of their respective work .

2. Net-SEAL

(A website ,teaching Networking through animation)
    Another one of the best possible attempt is Net-SEAL website ,its actually a Networking Website which teaches the Networking concept online including OSI layers ,they have a wonderful website full of graphics which helps people to learn about Networking concept in detail and a quick graphic view .

3. Visualization Teaching Tool for Simulation of OSI Seven Layer,Architecture.
Paper published in SoutheastCon in 2004. Proceedings. IEEE ,which is actually a visualizing tool to learn about OSI model ,which gives us knowledge about the functionality of OSI model by visualizing every step followed by the protocol of OSI model.

4. A proposed "OSI based" network troubles identification model :
Murat Kayri1 and _smail Kayri2
Department of Computer and Instructional Technology, Yuzuncu Yil University, Van,Turkey.

This is a software model used to detect the problems occurred in the existing system of OSI layered architecture, this is an good attempt to make OSI Model a problem free networking protocol model .

III. PROPOSED SYSTEM

An open source software suit for developer reusability and the animation software for corresponding layers to simulate the individual layer functionalities and to deliver a teaching application for academics purpose. As we know particularly in the academic field we study OSI reference model hypothetically but we never know how actually OSI reference model is working ,how all the seven layers work in co-ordination with each other by using different different algorithms to let the communication happen on different networks as well as systems for that reason this paper intends to give this Hypothetical model a shape to know its work culture and to understand it in a we can learn its real time implementation .

Architecture

The bellow architectural design defines the OSI layered architectural design, OSI layers communicate with each other on their opposite equivalent sides. Communication occurs only when all the layers start communication step by step to their corresponding destination layers of another system.In the bellow diagram source process starts functioning   and it delivers its message to the OSI layers, by the communication channel it requests the communication to be occur with the OSI layers of the Destination process, likewise communication take place.
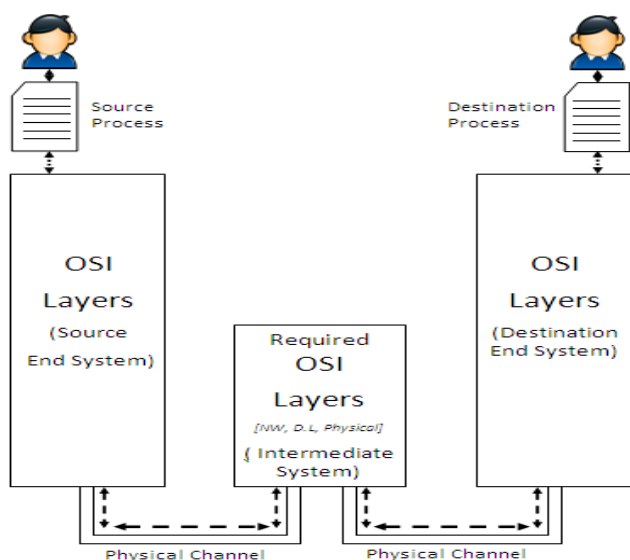
As the data flows down through the layers in the hierarchy, each layer adds some extra information to the data in the form of headers or tailors.

This process of wrapping data with headers and tailors is called encapsulation.These extra information are added for: To enable the opposite corresponding layer to take the right operation on the data (to facilitate his work).To enable the network to transfer the data accurately from the source to the destination. Through these information each layer actually communicates with the opposite corresponding layer and this is called peer-to-peer communication. At the receiver side De-Encapsulation take place.

Reliable Process-to-Process Delivery.
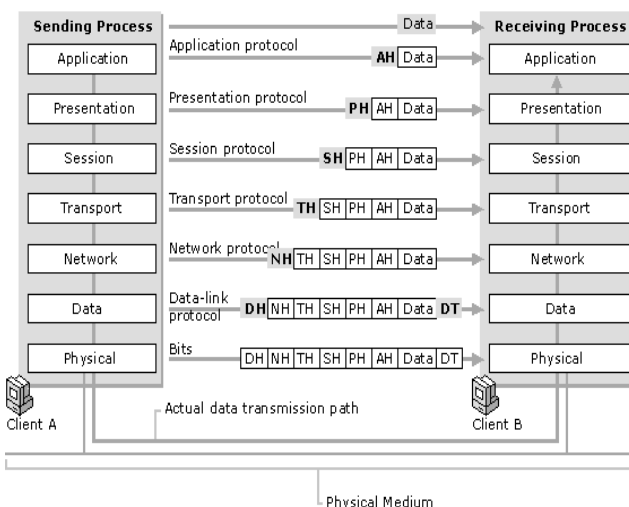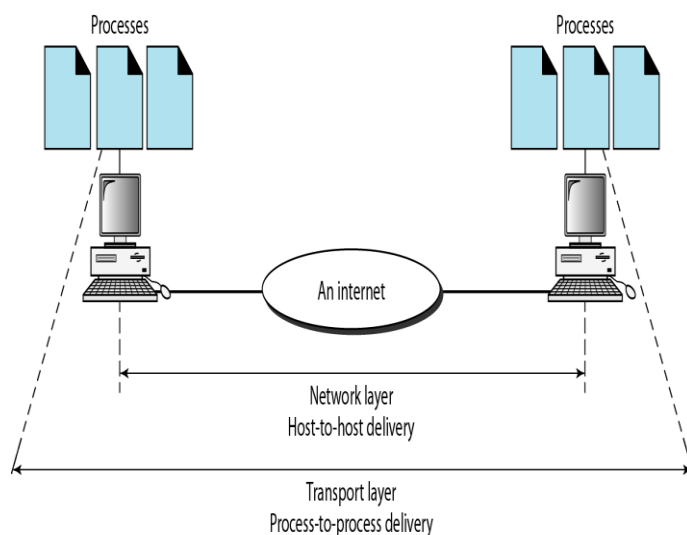
V. EXPERIMENTAL SETUP AND RESULT:

We are using programming language Java. To transform the conceptual model into a complete OSI simulation model .Our System will be aiding the developers, researchers and academicians to Understand, Reuse and to customize the functionalities according to their needs.The end product will be published as an open source.The OSI Software Model not only prescribes a layered architecture, but also defines which layers are conceptually to be found in a standard communication system, which services these layers offer and which functions the individual layers are expected to be able to perform in order to offer these services.

VI. CONCLUSION

In conclusion this paper, we proposed to provide an informative software model to study the actual functionality of the layers of OSI model. Problem is that we know how OSI model works but we never know how exactly information flows over the different layers of the OSI model .this simulation model not only shows us visually how it works but also describes all the seven layers , and its open source can be used by the people of different professions and can use this according to their needs .

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