# UNIT – 3 NETWORK ARCHITECTURE

Protocol Hierarchy

The communication between the computers in the Internet is defined by different protocols. The protocols TCP (Transmission Control Protocol) and IP (Internet Protocol) build the basis of the communication in the Internet. The combination of the TCP and the IP protocol is known as TCP/IP protocol that represents the standard system used in most large networks.
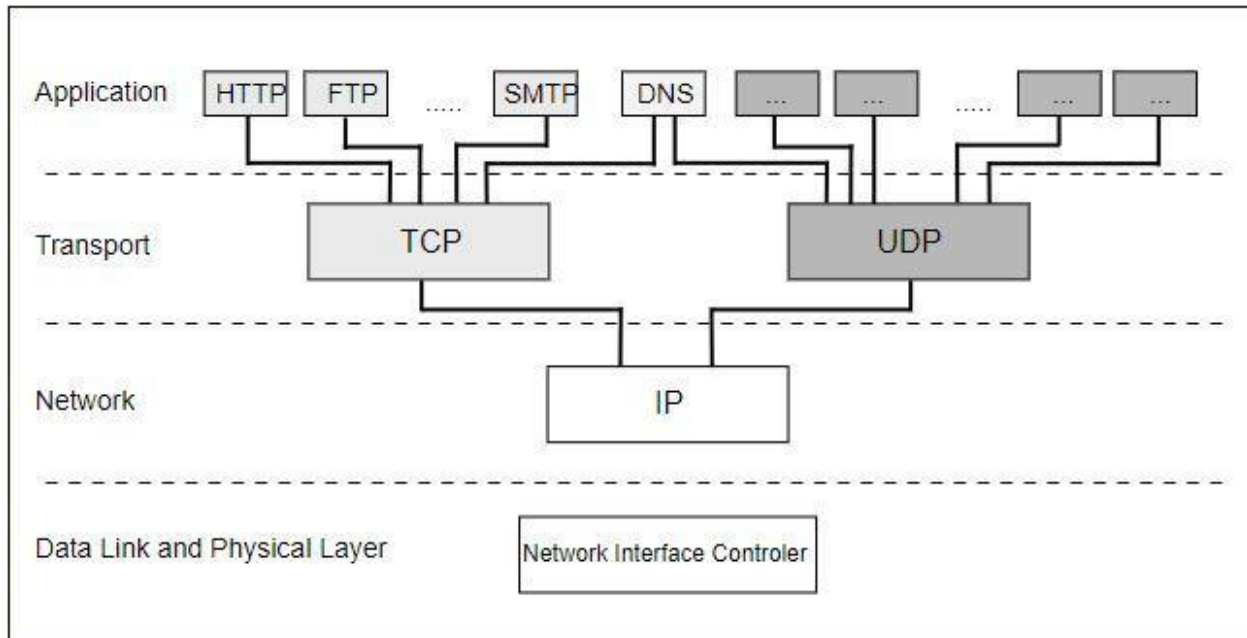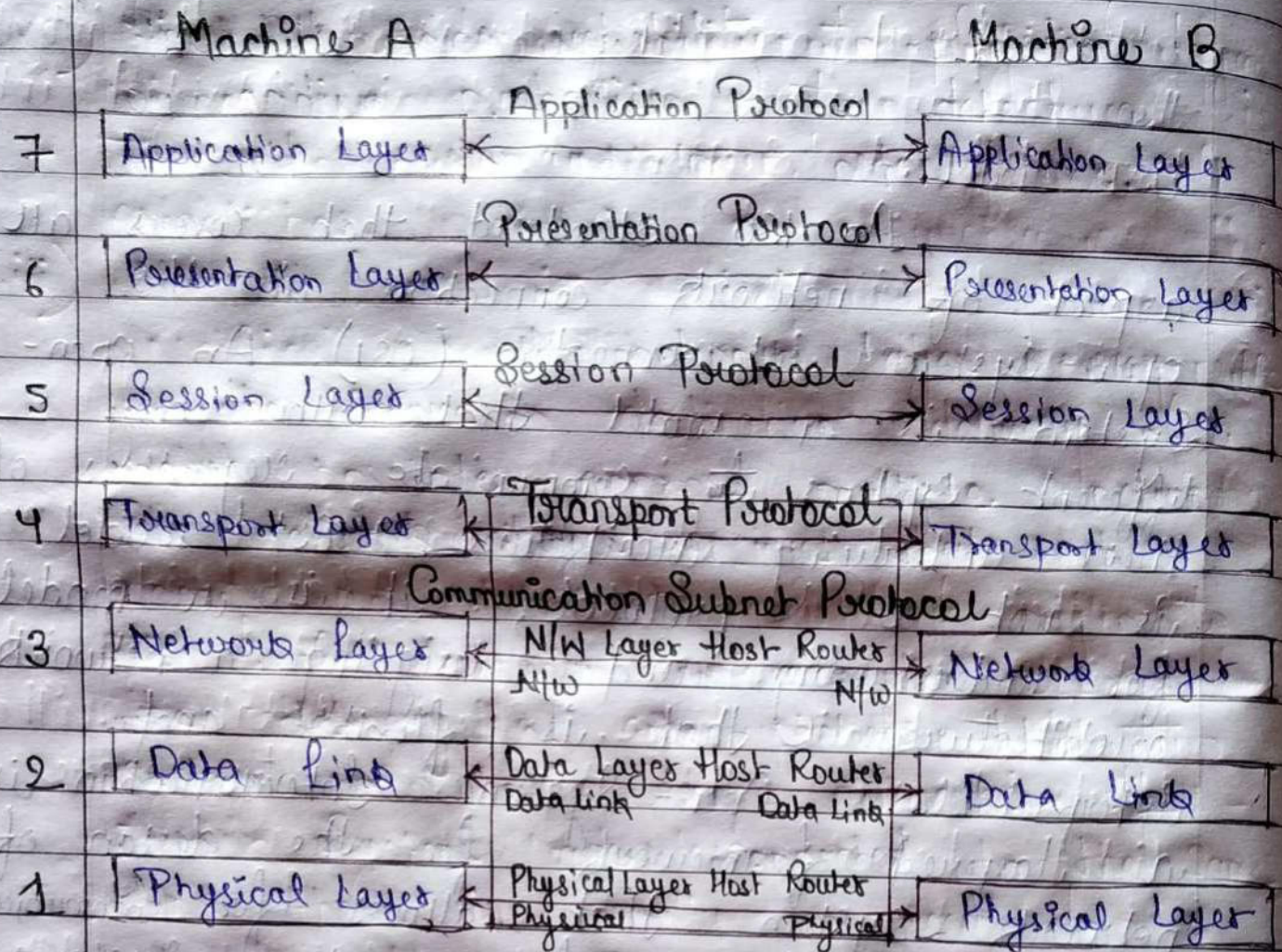

Peer Process

Peer-to-peer (P2P) is a decentralized communications model in which each party has the same capabilities and either party can initiate a communication session. Unlike the client/server model, in which the client makes a service request and the server fulfills the request, the P2P network model allows each node to function as both a client and server

P2P systems can be used to provide routing of network traffic, massive parallel computing environments, distributed storage and other functions.

Unit-4   OSI Reference Model

OSI Model :-

An ISO standard that covers all aspect of network connection in the open-system interconnection (OSI). An open-system is a model that allows only 2 different systems to communicate regardless of their underlying architecture. OSI model is not a protocol, it is a model for understanding and designing a network architecture that is flexible and interpretable. Open-System Interconnection is a layered framework for the design of network system that allows for communication across all types of computer systems. It consists of seven seperate layers but related layers each of which define a segment of the process of moving information across a network. The OSI model is sometimes called The Seven Layer Model. It was developed by International Standard Organisation (ISO) in 1983.

	Machine A		Machine B
7	Application Layer	← Application Protocol →	Application Layer
6	Presentation Layer	← Presentation Protocol →	Presentation Layer
5	Session Layer	← Session Protocol →	Session Layer
4	Transport Layer	← Transport Protocol →	Transport Layer
3	Network Layer	Communication Subnet Protocol ← N/W Layer Host Router → N/w N/w	Network Layer
2	Data Link	Data Layer Host Router Data Link Data Link	Data Link
1	Physical Layer	Physical Layer Host Router Physical Physical	Physical Layer

1. Physical Layer :-

The physical layer co-ordinate the function required to transmit a bit sitting over a physical medium. It deals with a transmission medium, it also defines the procedure and function that the physical devices and interfaces have to perform for transmission to occur. It is responsible for the actual physical connection between the devices, such physical connection may be made by using twisted pair

cable, fibre optic, co-axial cable or wireless communication. It defines how devices are connected to a network. The transmission rate is also defined by the physical layer.

ii) Data Link Layer :-

Data Link Layer transforms the physical layer, a raw transmission facilities to a variable link is responsible for node to node delivery. It mix physical layer appear error-free to the upper-layer specific responsibilities of the data link including following :-

a) The data link layer divides the stream 0 bits recieved from the network layer into manageable data units called frame.

b) If frames are to be distributed different system on the network, the DLL adds a header to the frame to define the physical address of the sender that is source address & reciever that is Destination address of the frame.

c) The rate at which the data are assorted by the reciever is less than the rate produces in the sender, the DL imposes a flow control mechanism to prevent over the reciever.

d) The DLL adds reliability to physical layer by adding mechanism to detect a transmit damage or lost frame.

iii) **Network layer :-**

The network layer is responsible for the source to destination delivery of a packet possible across multiple networks. The network layer ensures that each packet gets from its points of origin to its final destination whereas the DLL oversees the delivery of the packets b/w two systems on the same network. If two systems are connected to the same link there is usually no need for a network layer. However, if the two systems are attached to different network with connecting devices b/w the network there is often a need for the network layer to accomplish source to destination delivery. If a packet passes the network boundary are need another addressing system to help distinguish the source and destination systems. The network layer adds a header to the packet coming from the upper layer that among other things include the logical address of the sender and reciever. When independent networks

and links are connected together to create an internetwork or a large network, the connecting devices called Router and Gateway, route to the packet to their final destination.

iv) Transport Layer :-

The transport layer is responsible for source to destination delivery or the data message whereas network layer overseas end-to-end delivery of individual packets. It doesn't recognise any relationship between those packets. It treats each one independently. The transport layer on the other hand ensures that the whole message arrive in fact and in order, overseeing both error control and flow control, all the source to destination level. For added security, the transport layer may create a connection b/w the two end parts. A connection is a single logical path between the source and destination that is associated with all packets in a message creating a connection envolve three steps :—

i) Connection Establishment
ii) Data Transfer
iii) Connection Release

v) Session Layer :-

The Service provided by the