STUDY MATERIAL – 9
TOPIC – NETWORKING

SUBJECT: COMPUTER APPLICATION **CLASS: XII**
DATE: 25.07.2020

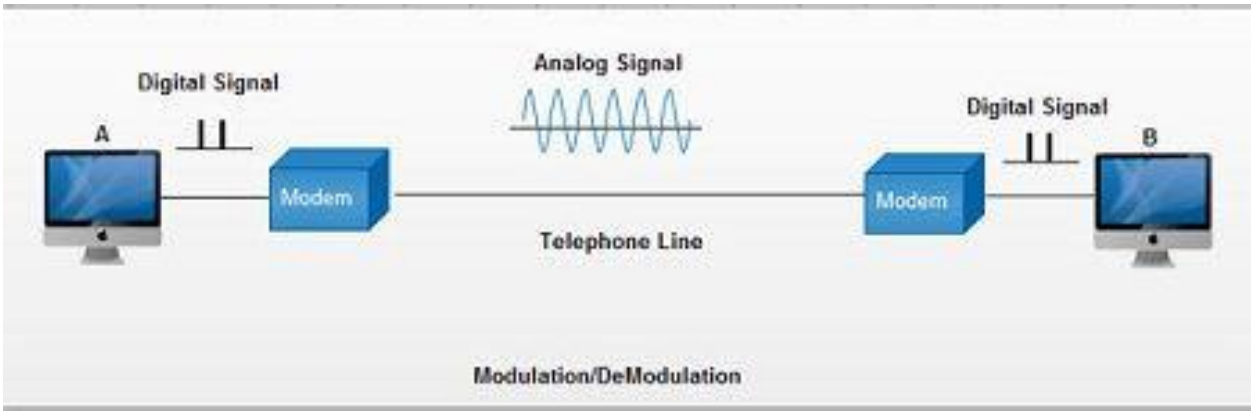
MODEM

The data transmitted by a computer is digital in nature. But, the telephone lines, which transmit the signal can only carry analogue signal. In this scenario, MOdulator - DEModulator - a device used for communication using computers & the local telephone lines.

❖ **Use:**

✓ Before transmission, a modem converts the digital signal to analogue form. This process is called modulation.

✓ On reaching the destination, another modem converts the analogue signal back to digital form, before the computer accepts it. This process is called demodulation.



❖ **Modems are available as external and internal modems.**

- ✓ External modems are connected to the computer through external ports and have their own power supplies.
- ✓ Internal modems are available as add-on cards for PCI slots on the motherboard.

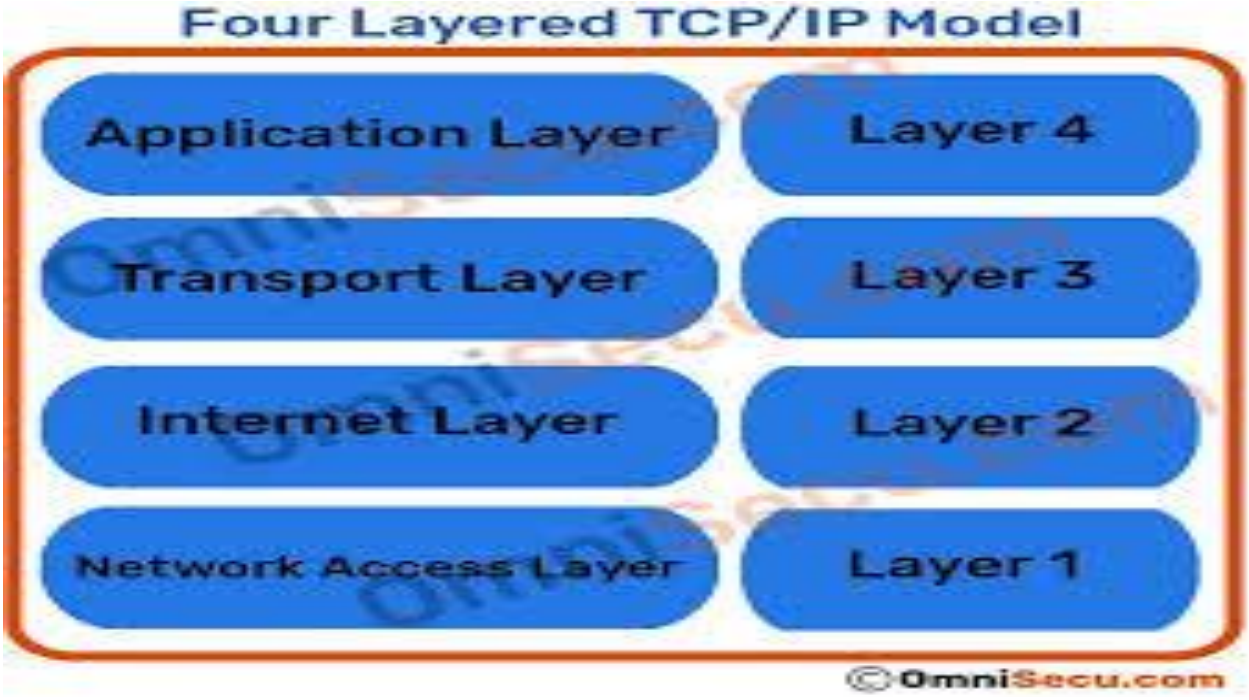
❖ In both cases, the external telephone line is connected to the modem through proper port

TCP/IP Protocols

TCP/IP is the name given to a family of communication protocols developed by U.S. department of defence, to organise computers from different networks into a single logical network to form the most important set of WAN protocols presently.

➢ **TCP/IP Model**

This is a 4 layered model with each layer sharing different responsibility in the overall communication between two computers in a network



- Transmission control protocol (TCP) is a network communication protocol designed to send data packets over the Internet.
- Before transmitting data, TCP creates a connection between the source and destination node and keeps it live until the communication is active.
- TCP breaks large data into smaller packets and also ensures that the data integrity is intact once it is reassembled at the destination node.

Internet Protocol(IP)

- Internet Protocol (IP) is the principal set (or communications protocol) of digital message formats and rules for exchanging messages between computers across a single network or a series of interconnected networks, using the Internet Protocol Suite

- Messages are exchanged as datagrams, also known as data packets or just packets.
- The main purpose and task of IP is the delivery of datagrams from the source host (source computer) to the destination host (receiving computer) based on their addresses. To achieve this, IP includes methods and structures for putting tags (address information, which is part of metadata) within datagrams. The process of putting these tags on datagrams is called encapsulation.

File Transfer Protocol(FTP)

- File Transfer Protocol (FTP) is a client/server protocol used for transferring files to or exchanging files with a host computer.
- It may be authenticated with user names and passwords. Anonymous FTP allows users to access files, programs and other data from the Internet without the need for a user ID or password.
- Web sites are sometimes designed to allow users to use 'anonymous' or 'guest' as a user ID and an email address for a password.
- FTP is also the Internet standard for moving or transferring files from one computer to another using TCP or IP networks.

Hypertext Transfer Protocol(HTTP)

HTTP is a set of standards that allow users of the World Wide Web to exchange information found on web pages. When accessing any web page entering http:// in front of the address tells the browser to communicate over HTTP.

There are three **important features** of HTTP:

- **HTTP is Connectionless -** After a request is made, the client disconnects from the server and waits for a response. The server must re-establish the connection after it processes the request.

- **HTTP is Media Independent -** Any type of data can be sent by HTTP as long as both the client and server know how to handle the data content.

- **HTTP is Stateless -** This is a direct result of HTTP being connectionless. The server and client are aware of each other only during a request. Afterwards, each forgets the other. For this reason neither the client nor the browser can retain information between different requests across the web pages.

User Datagram Protocol(UDP)

- UDP is a reduced version of TCP.
- It is used in situations where the reliability overhead of TCP is not required.
- Applications like streaming multimedia can tolerate some data loss and hence can use UDP along with IP to deliver data.
- UDP is much faster than TCP. It is more suitable for streaming multimedia applications and small data size.
- It does not guarantee data delivery and data may not be delivered on time.

TELNET

- TELNET is a client-server protocol in the application layer that allows users to login and run programs on a remote computer in a network.
- Telnet allows a user at one site to interact with application programs that run on a computer at another site.
- One can fix problems in a computer from a remote computer using Telnet.
- Telnet is not secure & Working on a computer using telnet is slow.

IP Address

Any device that uses TCP/IP needs at least one unique IP address for each connection. An IP address is a 32 bit binary number divided into four octets with 8 bits per octet.

e.g. 216 . 3 . 128 . 12

equivalent binary: 11011000 . 00000011 . 10000000 . 00001100

❖ **IP address consists of two parts:**

- **The Network ID:**

  It is that part of the address which is shared by all devices in a given network. It is unique for the entire network.

- **The Host ID:**

  It is that part of the IP address which separates different devices having the same Network ID. Each device within a given network has a unique Host ID.

❖ **Classes of IP Address:**

All IP addresses are divided into certain Classes depending on the distribution of the network ID and host ID.

- **Class A Address:** Any IP address that starts with '0' in binary in the first bit of the first octet.

Generally used by multinational companies with very large networks.

0 x x x x x x x . x x x x x x x x . x x x x x x x x . x x x x x x x x

- **Class B Address:** Any IP address that starts with '10' in binary in the first 2 bits of the first octet.

  Generally used by ISPs.

1 0 x x x x x x . x x x x x x x x . x x x x x x x x . x x x x x x x x

- **Class C Address:** Any IP address that starts with '110' in binary in the first 3 bits of the first octet.

  Such address is generally used by middle sized or small companies.

1 1 0 x x x x x . x x x x x x x x . x x x x x x x x . x x x x x x x x

- **Class D Address:** Any IP address that starts with '1110' in binary in the first octet.

  These addresses are used for a service called Multicast, i.e., for addressing a group of internet addresses

- **Class E Address:** These addresses are experimental addresses and reserved for future use.

Class	ID Distribution	1st Octet Starts With	Total Number of Networks	Hosts per Network
A	N. H. H. H	0	126	1,67,77,214
B	N. N. H. H	10	16,382	65,534
C	N.N.N.H	110	20,97,150	254
D & E	Special Addresses & Unavailable for general use			

N – Network

H – Host

***

PRITHWISH DE