**TMA 01: Classify computer networks based on their scale.**

**Computer Network**

In simple terms network means an interconnected set of some objects. We are familiar with the Radio, Television, Railway, Bank, Mobile and other types of networks. In recent years, the network that is making significant impact in our day-to-day life is the computer network. Computer network is a collection of autonomous computers and devices connected to each other. The computers can be geographically located anywhere. The term autonomous implies that the computers can function independently of others. However, the network allows computers to communicate with each other and to share resources and information. In a short period of time computer networks have become an indispensable part of business, industry, entertainment as well as all aspects of our daily life. The

computer that provides resources to other computers on a network is known as server. In the network the individual computers, which access shared network resources, are known as workstations or nodes.

**Different types of Computer Network**

There are three types of computer networks based on geographical area

1. LOCAL AREA NETWORK (LAN)
2. METROPOLITAN AREA NETWORK (MAN)
3. WIDE AREA NETWORK (WAN)
4. LOCAL AREA NETWORK (LAN)

Local Area Network, generally called LANs, is privately owned network within a single building, or inside buildings close to each other. This usually spans about 0 to 5 kilometers and is generally a private network owned by an organization. For example: Office LAN, Hospital LAN, Campus-wide LAN, etc.

Advantages

 The reliability of network is high because the failure of one

computer in the network does not affect the functioning of other

computers.

 High speed and error free data transmission is possible - 10 Mbps

to 1000 Mbps and more.

 Peripheral devices like magnetic disk and printer can be shared

by other computers.

 Addition of new computer to network is easy.

 Lower cost.

(ii) METROPOLITAN AREA NETWORK (MAN)

A Metropolitan Area Network, or MAN, is basically a bigger version of a LAN and normally uses similar technologies. This usually spans 5-50 kilometers of range. It might cover a group of nearby corporate

offices or a complete city and might be either private or public. Speed is about 10 MBPS standard. Its reliability is moderate.

(iii) WIDE AREA NETWORK (WAN)

A Wide Area Network, or WAN, spans a large geographical area (unlimited), often a country or continent. WAN is more sophisticated and Expensive technology. Data transfer rate is low (few KBPS to 10 MBPS) and error rate is much higher.

Besides above description on network, There is another Network conception has been familiar to us named Personal Area Network (PAN).

Personal Area Network (PAN)

Personal Area Network is an ad hoc type network operable over a small area such as a room. Bluetooth wireless technology which is a short range radio technology is developed for Personal Area Network (PAN). Bluetooth wireless technology makes it possible to transmit signals over short distances between telephones, computers and other devices and thereby simplify communication and synchronization between devices.

Conclusion:

Initially, computer network was developed for defense purpose, to have a secure communication network that can even withstand a nuclear attack. After a decade or so, companies, in various fields, started using computer networks for keeping track of inventories, monitor productivity, communication between their different branches offices located at different locations. For example, Railways started using computer

networks by connecting their nationwide reservation counters to provide the facility of reservation and enquiry from anywhere across the country. And now after almost two decades, computer networks have entered a new dimension; they are now an integral part of the society and people. In 1990s, computer network started delivering services to private individuals at home. Some of the services are access to remote information, personperson communication, and interactive entertainment.

**TMA 02: Explain in brief different types of internet connection.**

Introduction:

Internet is a collection of networks or network of networks that connect computers all over the world. A common form of Internet is a collection of LANs connected by a WAN through suitable hardware and software to work in a seamless manner. Internet provides various applications such as e-mail; file transfer, remote log-in, World Wide Web, Multimedia, etc run across the internet. It is evolving into the information superhighway of the future. Using internet, organizations can exchange data, people can communicate with each other in a faster and effective way all over the world. With the help of video conferencing over the internet, it has become possible that people can even see each other while they are communicating. Even one can purchase all his shopping sitting back at home. He does not bother to visit crowded market place for wasting his valuable time. Gradually, shopkeepers are also interested to go for electronic commerce which provides them greater reach, faster and better ways to do business over the internet.

There are five types of internet connections which are as follows:

**(i) Dial up Connection**

**(ii) Leased Connection**

**(iii) DSL connection**

**(iv) Cable Modem Connection**

**(iv) VSAT**

**Dial up connection**

Dial-up connection is established using a modem. The modem connects computer to standard phone lines that serve as the data transfer medium. When a user initiates a dial-up connection, the modem dials a phone

number of an Internet Service Provider (ISP) that is designated to receive dial-up calls. The ISP then establishes the connection, which usually takes about ten seconds and is accompanied by several bee pings and a buzzing sound. After the dial-up connection has been established, it is active until the user disconnects from the ISP. Usually, this is done by selecting the “Disconnect” option using the ISP‟s software or a modem utility program. However, if a dial-up connection is interrupted by an incoming phone call or someone picking up a phone, the service may also be disconnected.

**Leased Connection**

Leased connection is a permanent telephone connection between two points set up by a telecommunications transporter. Typically, leased lines are used by businesses to connect geographically distant offices. Unlike

normal dial-up connections, a leased line is always active. The fee for the connection is a fixed monthly rate. The primary factors considering the monthly fee are distance between end points and the speed of the circuit. Because the connection doesn‟t carry anybody else‟s communications, the carrier can assure a given level of quality. For example, a T-1 channel is a type of leased line that provides a maximum transmission speed of 1.544 Mbps. You can divide the connection into different lines for data and voice communication or use the channel for one high speed data circuit. Increasingly, leased lines are being used by companies, and even individuals, for Internet access because they afford faster data transfer rates and are cost-effective if the Internet is used heavily.

**DSL (Digital Subscriber Line)**

Digital Subscriber Line (DSL) is a technology that provides digital data transmission (data, voice, and video) using existing telecommunication network. DSL is a high-speed data service that works over conventional telephone lines and is typically offered by telephone companies. It does not occupy the phone line-you can still talk on the phone. Speed is much higher than regular modem. The data bit rate of consumer DSL services typically ranges from 256 Kbit/s to 40 Mbit/s in the direction to the customer, depending on DSL technology, line conditions and service-level implementation.

**Cable Modem Connection**

Cable modem transmits and receives data as digital packets, meaning they provide high-speed Internet access. This makes cable modem connections much faster than traditional dial-up connections. Cable modems have the potential to receive data from their cable provider at speeds greater than 30 megabits per second. The cable TV company runs a coaxial cable into the building to deliver their Internet service. Although fed from the same coax that provides cable TV service, most companies place a splitter outside of the building and runs two cables in, rather than using a splitter at the set-top box.

**VSAT**

Very Small Aperture Terminal, an earthbound station used in satellite communications of data, voice and video signals, excluding broadcast television. A VSAT consists of two parts, a transceiver that is placed outdoors in direct line of sight to the satellite and a device that is placed indoors to interface the transceiver with the end user’s communications device, such as a PC. The transceiver receives or sends a signal to a satellite transponder in the sky. The satellite sends and receives signals from a ground station computer that acts as a hub for the system. Each end user is interconnected with the hub station via the satellite, forming a star topology. The hub controls the entire operation of the network. For one end user to communicate with another, each transmission has to first go to the hub station that then retransmits it via the satellite to the other end user’s VSAT.

Conclusion:

Network allows computers to communicate with each other and to share resources and information. Through this unit some of the basic aspects of computer networks and Internet is presented. In lesson 1 the historical background of computer networks is presented. Then different type of networks on the basis of scale is considered. Lesson 2 presents the important concepts of topology. In lesson 3 we discussed about network devices with their functionalities. Internet is a collection of networks or network of networks that connect computers all over the world.