

NOTES

Introduction

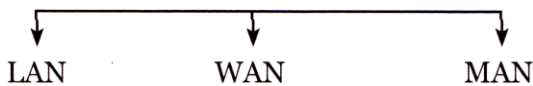
A computer network is a group of computers that are interconnected to share information and resources. The first networks were implemented by both IBM's SNA Systems Network Architecture) and Digital's network architecture. Internet is the biggest example of computer networking. Through Internet you can send email or file to any location in the world. While developing computer network, you need to use communication devices, such as modem and router. Basically, communication devices are usefull to send and receive data on the network.

Network means connecting with each other. Computers form network for sharing information and resources.

A number of computers and peripheral devices are interconnected in such a way that they can share resources and information. This is known as network. Networking is mainly concerned with the communication between computer systems. A computer network is any set of computers connected to each other with the ability to exchange information. Computer networking can be considered as a sub discipline of computer science, information technology and computer engineering.

Different Types of Networks

Computer network is divided into three main categories:



LAN

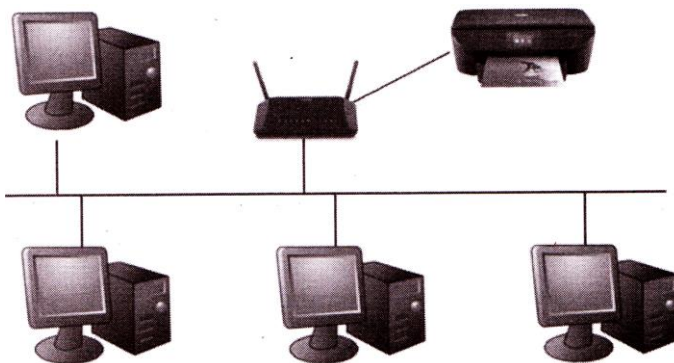
LAN is commonly known as Local Area Network. It is used to connect the computers and other network devices so that the devices can communicate with each other to share the resources. The resources to be shared can be a hardware like printer or a software like an application program or data. The size of LAN is usually small. The various devices in LAN are connected to central devices called Hub or switch using a cable. This network is limited to a relatively small area, such as a classroom, a school or a single building. This type of network has the lowest cost.

Advantages of LAN

- ❖ Ability to share hardware and software resources.
- ❖ All network users can save their data on hard disk of the server computer.
- ❖ Components and system evolution is possible.
- ❖ Support for heterogeneous forms of hardware and software.
- ❖ Access to other LAN's and WAN's.
- ❖ Private ownership.
- ❖ Secure transfers at high speeds with low error rates.

Disadvantages of LAN

- ❖ Equipment and support can be costly.
- ❖ Some types of hardware may not interoperate.
- ❖ A good LAN is required to be on all the times.
- ❖ A lot of times a network shares one internet connection only. If many computers are running at once, it can reduce speed for each.
- ❖ Area covered is limited.



WAN

WAN is also called Wide Area Network. It is a telecommunication network. A Wide Area Network is simply a LAN of LANs or Network of Networks. It connects LANs which could be on opposite sides of a building, across the country or around the world. WANs are characterized by the slowest data communication rates and the largest distances. Computers connected to a WAN are often connected through public networks, such as telephone system. The largest WAN in existence is the Internet.

Advantages of WAN

- ❖ It covers a very large geographic area, like a country or long distance businesses can connect on the one network.
- ❖ The speed of WAN is very high.
- ❖ WAN helps organizations to form their global integrated network.
- ❖ Messages can be sent very quickly to anyone on the network.

Disadvantages of WAN

- ❖ The bigger the network the more expensive it is.
- ❖ The cost for equipment and technology is very expensive.
- ❖ It is difficult to maintain the network.

MAN

MAN is generally known as Metropolitan Area Network. It is designed for a home or a city. In terms of geographic breadth, MANs are larger than local-area networks (LANs), but smaller than wide area network (WANs). MANs are usually characterized by very high speed connections using cable or digital media.

Advantages of MAN

- ❖ It provides larger and controllable computer network than LAN and WAN.
- ❖ It has lower implementation cost than WAN because it requires very less resources as compared to WAN.

Disadvantages of MAN

- ❖ The overall installation and management cost is high.
- ❖ As compared to LAN, it requires more cables for connection from one place to another.

Comparison between LAN, MAN & WAN

Basis of Comparison	LAN	MAN	WAN
Speed	High	Moderate	Low
Propagation Delay	Short	Moderate	Long
Congestion	Less	More	More
Fault Tolerance	More tolerant	Less tolerant	Less tolerant
Used for	Schools, Colleges, hospital	Small towns, city	Country, Continent

Terminology Related to Network

Client-Server System

A client-server system consists of two logical parts: a server which provides the services and a client which requests them. Railway Enquiry system is a good example of client- server system. When you use your personal computer to check the schedule time about any train, the client program that runs in your computer forwards the request to a server program that runs at the railway computer. The server program retrieves the information and returns back to your personal computer. Your personal computer displays the schedule time of requested train.

Advantage of Client-Server Networking

The main advantage of a client-server networking system is that you can perform administration or configuration of your entire network from a single location. The capacity of clients and servers can be increased separately.

Disadvantage of Client-Server Networking

Client-server networking model is very costly because it requires more hardware's and the server operating system, for the server. The biggest problem in the client-server networking is traffic congestion.

Switch

A switch is a connecting device that is used to develop computer network. It contains multiple ports that allow connecting more than one computer. Switch increases the network speed. It is faster than the bridge because it only looks at destination address. Bridge is also a device which is used for connecting computers. Switches are more expensive than bridges.

Router

A Router is also a network connecting device. The main difference between switch and router is that router decides the best path for data transmission from source to the destination. Router also increases the network speed.

Workstation

Workstation is a computer which is designed for technical or scientific applications. The term workstation has also been used to refer to a mainframe computer terminal or a personal computer connected to a network.

A workstation may have the following features:

- ❖ A larger number of memory sockets
- ❖ Multiple processor sockets
- ❖ Multiple displays
- ❖ Support for ECC (Error Correcting Code) memory

Ethernet Networking Card or Network Interface Card (NIC)

The NIC (Network Interface Card) is also called Ethernet Networking card. It is a circuit are equipped with microchips that is physically installed within an active network node, such as a computer, a server or a printer. It enables to connect your computer with network.

Internet

Internet is a global network. Basically, Internet is a type of WAN that uses TCP/IP protocol. Protocol is a set of rules. If you want to use the Internet on your PC, you need an Internet connection and a browser. There are number of browsers available in market, such as Internet Explorer and Mozilla firefox. Browser is a software that enables a GUI to open a Website.

Services Provided by Internet:

- ❖ **Email:** Using Email you can send any information, greeting or any type of file, such as a picture to any location of the world.
- ❖ **Ticket booking:** Using Internet you can book your railway ticket, air ticket or movie ticket. You do not need to go anywhere, just connect your computer with the Internet and book whatever you want.
- ❖ **Banking:** Using Internet you can check the status of your bank account. You can also transfer money from one account to other account.
- ❖ **Searching:** It is one of the most important features through which we are able to grasp knowledge of anything through any of the search engine. GOOGLE is one of the common search engine through which we can get any information regarding any topic, organization, and many other things can be learned through this.
- ❖ **Chatting:** Using Internet, you can chat with your friends in live environment. There are various chatting tools available in market, such as Google Talk.
- ❖ **E-learning:** E-learning is a new revolution in learning world. Using Internet you can learn any subject anywhere anytime.