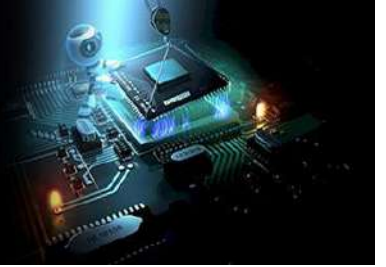


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Gagandeep Kaur
Assistant Professor, Guru
Nanak College, Ferozepur,
Punjab, India

A review on computer networking

Gagandeep Kaur

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Abstract

Computer networks are the basis of communication in IT. They are used in a huge variety of ways and can include many different types of network. Computer networks have gone inchmeal ubiquitous. In today's modern world, a computer network is much else than a collection of connected habitude. Computer networks are a system of connected computers for the purpose of partaking digital information. The computer network enables to assay, organize and circulate the information that's essential to profitability. The rise of intranets and internets is the important aspect of computer networking. Intranets and internets are private business networks that are hung on internet technology. The businesses are presently applying intranets at a hasty pace and for one reason only, an intranet enables a business to collect, manage and circulate information more fast and freely than ever anteriorly. Multifold businesses are applying intranets simply to remain competitive; business that holdback is likely to see their competition outdo them. In the present study we're presenting the elementary generalizations of networking.

Keywords: computer network, network configuration, network plan, types of network connections etc.

Introduction

A computer network could be a set of computers that area unit connected along so they'll share data. The earliest samples of pc networks area unit from the Nineteen Sixties, however they need return an extended means within the period of time since then. A electronic network consists of 2 or a lot of computing devices that area unit connected so as to share the parts of your network (its resources) and therefore the data you store there, as shown in Figure one 1. The foremost basic electronic network (which consists of simply 2 connected computers) will expand and become a lot of usable once extra computers be a part of and add their resources to those being shared.

The first computer (pc), yours, is often stated as your local computer. It's a lot of seemingly to be used as a location wherever you are doing work, a digital computer, than as a storage or dominant location, a server. As a more computers are connected to a network and share their resources, the network becomes a lot of powerful tool, as a result of workers employing a network with a lot of data and a lot of capability area unit able to accomplish a lot of through those adscititious computers or extra resources.

The real power of networking computers becomes apparent if you envision your own network growing so connecting it with different distinct networks, sanctionative communication and resource sharing across each networks. That is, one network will be connected to a different network and become an additional powerful tool as a result of the bigger resources. As an example, you may connect the network you and your classmates develop for this course to equally made networks from different introductory networking categories if you needed them to share your info and networked resources. Those categories can be at intervals your own faculty, or they might be anyplace within the world. Where that freshly joined network is, the communication and resource sharing activities therein new network might then be shared with anyone connected to your network. All you've got to try and do is be a part of that new network's community or permit its members to affix yours.

In addition, a company's cost of doing business can be reduced as a result of sharing data (defined as a piece or pieces of information) and resources. Instead of having individual copies of the data at several locations around the company, and needing to keep all of them similarly updated, a company using a network can have just one shared copy of that data and share it, needing to keep only that one set of data updated. Furthermore, sharing networked resources (like printers) means that more people can use a particular resource and a wider variety of resources (like different printers) can be used by each network user.

Correspondence
Gagandeep Kaur
Assistant Professor, Guru
Nanak College, Ferozepur,
Punjab, India



Fig 1: A electronic network consists of 2 or a lot of computing devices that area unit connected so as to share the parts of your network

Networking supports communication between two or more programs running on physically distant machines. A computer network is a collection of computers, which are in some way connected such that they can exchange data between themselves and other computers on the network. A network is created when two or more computers are connected to share information and resources. A set of computers exchanging information by common conventions called protocols over communication media. A computer network is simply computers wired together in a way that lets them share data and/or devices such as hard drives, CDROMs, fax-modems, printers, etc. A computer network is an interconnected collection of autonomous computers where interconnected means that the computers can exchange information and autonomous means that no computer can start, stop or control another computer connected to the network.

Network configuration

Network configuration is the process of setting a network’s controls, flow and operation to support the network communication of an organization and/or network owner. This broad term incorporates multiple configuration and setup processes on network hardware, software and other supporting devices and components.

Broadly speaking, there are two types of network configuration, peer- to-peer networks and client/server networks.

1) Peer-to-Peer Networks

Peer- to-peer networks are more commonly implemented where less than ten computers are involved and where strict security is not necessary. All computers have same status, hence the term “peer”, and they communicate with each other on an equal footing. Files can be shared across the network and all the computers on the network can share devices such as printers or scanners, which are connected to any one computer.

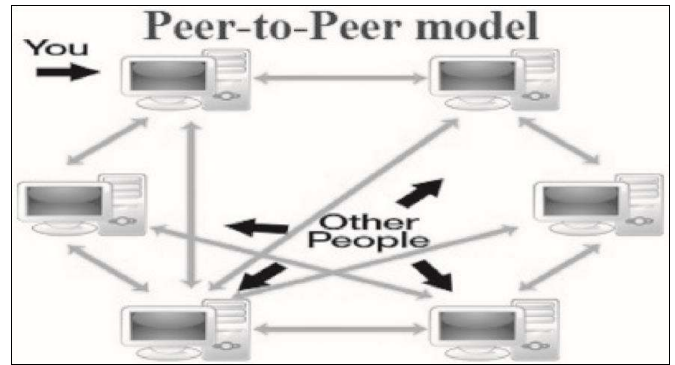


Fig 2: Peer-to-peer model

2) Client/server Networks

Client/server networks are more suitable for larger networks. A central computer, or “server”, acts as the storage location for files and applications shared on the network. Usually the server is higher than an average performance computer. The server also controls the network access of the other computers which are referred to as the “client” computers. Only the network administrator will have access rights to the server while others cannot. Others can only use the client computers.

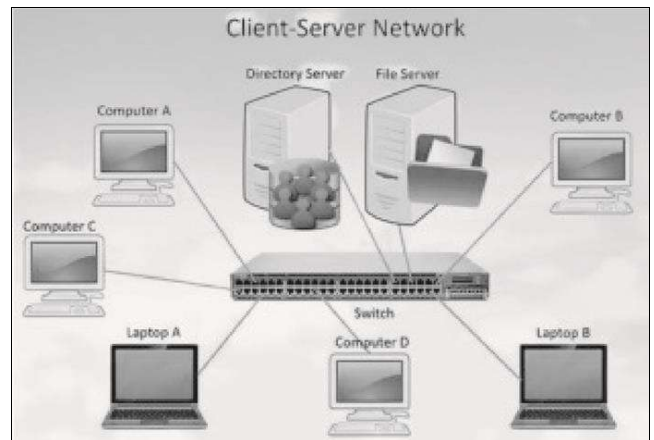


Fig 3: Client-server network

Types of network

There are many different types of network, which can be used for different purposes and by different types of people and organization. Here are some of the network types that you might come across:

- **Local Area Networks (LAN)**

A local area network or LAN is a network that connects computers within a limited area. This might be in a school, an office or even a home.

- **Personal Area Networks (PAN)**

A personal area network is a network that is based on an individual's workspace. The individual's device is the center of the network, with other devices connected to it. There are also wireless personal area networks.

▪ **Home Area Networks (HAN)**

A home area network connects devices within a home environment. It might include personal computers, tablets, smartphones, printers, TVs and other devices.

▪ **Wide Area Networks (WAN)**

A wide area network is a network that covers a larger geographical area, usually with a radius of more than a kilometer.

▪ **Campus Networks**

A campus network is a LAN or set of connected LANs which is used by a government agency, university, corporation or similar organization and is typically a network across a set of buildings that are close together.

▪ **Metropolitan Area Networks (MAN)**

Metropolitan area networks are networks that stretch across a region the size of a metropolitan area. A MAN is a series of connected LANs in a city, which might also connect to a WAN.

▪ **Enterprise Private Networks**

An enterprise private network is used by a company to connect its various sites so that the different locations can share resources.

Internetworks

Internetworks connect different networks together to build a larger network. Internetworking is often used to describe building a large, global network.

▪ **Backbone Networks (BBN)**

A backbone is a part of a network that connects different pieces and provides a path for information to be exchanged.

▪ **Global Area Networks (GAN)**

A global area network is a worldwide network that connects networks all over the globe, such as the internet.

Network plan

Networking computers first and tracking the connections later can quickly become confusing and unmanageable as you try to find which computer communicates with and shares resources with which other computers. In your human network, do you share everything with your friends? In your family network, would you want your parents or guardians to know your every thought? You have your information-sharing plan in your head, and it is important to keep track of it so you don't make a mistake and share something where it was not intended.

Similar concerns must be considered while designing a computer network. Before you even connect your first computers together, you should have a plan. A network plan, therefore, is a formally created product that shows all the network's components and the planned connections between them. Such a plan is also used to manage the various types of information. Your plan should show what types of information are stored where, and who is allowed to use each type.

Advantages of a computer network

Computer network is defined as a set of interconnected autonomous systems that facilitate distributed processing of information. It results in better performance with high speed

of processing.

These are main advantages of Computer Networks:

- 1) **Central Storage of Data:** Files can be stored on a central node (the file server) that can be shared and made available to each and every user in an organization.
- 2) **Anyone can connect to a computer network:** There is a negligible range of abilities required to connect to a modern computer network. The effortlessness of joining makes it workable for even youthful kids to start exploiting the data.
- 3) **Faster Problem solving:** Since an extensive procedure is disintegrated into a few littler procedures and each is taken care of by all the associated gadgets, an explicit issue can be settled in lesser time.
- 4) **Reliability:** Reliability implies backing up of information. Due to some reason equipment crash, and so on, the information gets undermined or inaccessible on one PC, another duplicate of similar information is accessible on another workstation for future use, which prompts smooth working and further handling without interruption.
- 5) **It is highly flexible:** This innovation is known to be truly adaptable, as it offers clients the chance to investigate everything about fundamental things, for example, programming without influencing their usefulness.
- 6) **Security through Authorization:** Security and protection of information is additionally settled through system. As just the system clients are approved to get to specific records or applications, no other individual can crack the protection or security of information.
- 7) **It boosts storage capacity:** Since you will share data, records and assets to other individuals, you need to guarantee all information and substance are legitimately put away in the framework. With this systems administration innovation, you can do the majority of this with no issue, while having all the space you requirement for capacity.

Disadvantages of network

These are main disadvantages of Computer Networks:

- 1) **It lacks robustness:** If a PC system's principle server separates, the whole framework would end up futile. Also, if it has a bridging device or a central linking server that fails, the entire network would also come to a standstill. To manage these issues, gigantic systems ought to have a ground-breaking PC to fill in as document server to influence setting to up and keeping up the system less demanding.
- 2) **It lacks independence:** PC organizing includes a procedure that is worked utilizing PCs, so individuals will depend a greater amount of PC work, rather than applying an exertion for their jobs that needs to be done. Beside this, they will be subject to the primary document server, which implies that, in the event that it separates, the framework would end up futile, making clients inactive.
- 3) **Virus and Malware:** On the off chance that even one PC on a system gets contaminated with an infection, there is a possibility for alternate frameworks to get tainted as well. Infections can spread on a system effectively, in view of the between availability of different gadgets.
4. **Lack of Independence**

- 4) **Cost of network:** The expense of executing the system including cabling and equipment can be expensive.

PC systems administration will dependably be a quick and advantageous methods for exchanging and sharing data, yet individuals ought to know about its outcomes too.

Types of network connections

There also are some differing kinds of network connections that concern however components during a network are connected to each other. In order to connect computers, topologies are used with a collapsed ring being the most common type due to the Ethernet supporting the internet, local area networks (LAN) and wide area networks (WAN). Here are some of the topologies that are used to create networks:

▪ Star Topology

In a star topology, a central node used to connects a cable to each computer in the network. Each computer in the network has an independent connection to the center of the network, and one connection breaking won't affect the rest of the network. However, one downside is that many cables are required to form this kind of network.

▪ Bus Topology

Alternatively referred to as line topology, bus topology is a network setup where each computer and network device is connected to a single cable or backbone. Depending on the type of computer network card, a coaxial cable or an RJ-45 network cable is used to connect them together.

▪ Ring Topology

Ring topology refers to a specific kind of network setup in which devices are connected in a ring and pass information to or from each other according to their adjacent proximity in the ring structure. This type of topology is highly efficient and handles heavier loads better than bus topology. A ring topology may also be called an active topology because messages are passed to each device in the ring.

▪ Network Protocols

Network protocols are the languages that computer devices use to communicate. The protocols that computer networks support offer another way to define and group them. Networks can have more than one protocol and each can support different applications. Protocols that are often used include TCP/IP, which is most common on the internet and in home networks.

▪ Wired and Wireless Networks

Many protocols can work with both wired and wireless networks. In recent years, however, wireless technologies have grown and become much more popular. Wi-Fi and other wireless technologies have become the favorite option for building computer networks. One of the reasons for this is that wireless networks can easily support different types of wireless gadgets that have become popular over the years, such as smartphones and tablets. Mobile networking is now an important thing to consider because it's not going to go away anytime soon.

Information management

Your network plan should help you manage the information

gathered, stored, and shared between your users. If you were given an empty three-drawer filing cabinet and told to use it to organize your company's information, you would have an excellent (although manual) example of a filing system that needs a plan. Having an overall guide that tells you who will be allowed access to the three drawers will help determine what you store in each one.

Once you have that part of the plan, you could put the least-used information in the bottom drawer, the more-used in the middle drawer, and the most-used in the top drawer so that it is easier for your users to access their information. Knowing who needs to know what, and its corollary—who does not need to know what—lets you determine whether to lock a particular drawer, too. Even when we discuss implementing a three-drawer manual filing system, the importance of having a network plan ahead of time becomes evident.

If you put the limited-access material in a drawer open to all employees, how do you keep it secure? Additional security measures (like adding a lock to a drawer, or moving the secure information somewhere else) may be required later. A networking plan could tell you that as specific types of sensitive data (like medical, personal, or payroll information) are gathered or grouped, they should be stored higher in the hierarchical structure (ranked from most sensitive to least sensitive), and this can save you time in the end. That plan should specify that the access requirements are stricter for sensitive data and reduce the number of people able to use specific types of information.

The distribution side of the networking plan, as opposed to the accumulation side of the plan discussed above, should spell out that the more an individual has access to the data in storage, the less they should be able to share groups of information entrusted to them. For example, you may not mind sharing your first name, but you would probably object to an instructor openly distributing all information in your school records to anyone requesting it.

Communication Link

In computer networking,

- Communication links enable the stations to communicate with each other.
- Stations may communicate using the following types of links:

Various types and forms of communication medium are:

- Fiber-optic cable.
- Twisted-pair copper wire.
- Coaxial cable.
- Wireless local-area links. (e.g. 802.11, Bluetooth)
- Satellite channel

Internet protocol (IP)

In networking, a protocol is a standardized way of doing certain actions and formatting data so that two or more devices are able to communicate with and understand each other.

To understand why protocols are necessary, consider the process of mailing a letter. On the envelope, addresses are written in the following order: name, street address, city, state, and zip code. If an envelope is dropped into a mailbox with the zip code written first, followed by the street address, followed by the state, and so on, the post office won't deliver it. There is an agreed-upon protocol for

writing addresses in order for the postal system to work. In the same way, all IP data packets must present certain information in a certain order, and all IP addresses follow a standardized format.

An IP address is a unique identifier assigned to a device or domain that connects to the Internet. Each IP address is a series of characters, such as '190.147.2.1'. Via DNS resolvers, which translate human-readable domain names into IP addresses, users are able to access websites without memorizing this complex series of characters. Each IP packet will contain both the IP address of the device or domain sending the packet and the IP address of the intended recipient, much like how both the destination address and the return address are included on a piece of mail.

Conclusion

Computer communication, it seems, can become a way a lot of usable networking tool once large numbers of individuals with similar interests acquire access to the technology. Although it will expedite the formation of latest social networks by overcoming the house and time barriers long-faced by ancient networking techniques, it still needs an excellent deal of targeted effort and resources to induce the individuals to use it. This drawback ought to become increasingly progressively more and a lot of decreased over the approaching years because the technological innovations become more subtle throughout society.

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