

COMPUTER NETWORKING

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A computer network is a logical or physical interconnection between two or more computers such that they could communicate with each other. The process of transferring data between computers is known as data communication. The data and information can be transmitted over significant distances through the computer network.

Advantage of Computer Network

- The computers on the network can share hardware devices like printer, scanner etc.
- Data and software can be shared within the computer on the network.
- Files can be transferred from one computer to another computer.
- Computers in the network can communicate with each other.

Disadvantages of Computer Network

- Data and information may be stolen by computer hackers.
- If any computer in the network gets affected by the virus, there is a high chance of spreading a computer virus.
- Computers on the network have to depend on the server.

Device necessary for networking

Computer

All computers connected to a network that participate directly in network communication are classified as hosts. Hosts can send and receive messages on the network. In modern networks, computer hosts can act as a client, a server, or both. The software installed on the computer determines which role the computer plays.

At

Network Interface Card

It is a hardware device which contains electronic circuitry needed to ensure reliable communication between workstation and server.

Communication Media

Communication media is transmission media where data signals are transmitted. There are two main types of communication channels. They are: Guided or Bounded or Wired Communication Media and Unguided or unbounded communication media.

Connecting devices

Connecting devices such as hub, switch, bridge, repeater etc are necessary for networking-order to connect one computer to another computer.

Protocol

A protocol is a set of rules for communicating across the internet.

List of protocol

1. HTTP (Hypertext Transfer Protocol)
2. FTP (File Transfer Protocol)
3. SMTP (Simple Mail Transfer Protocol)

TYPES OF COMPUTER NETWORKING

Computer network is classified into three category. They are as follows:



Local Area Network (LAN)

A local area network (LAN) is a small network of computer. It is a network of computers within a small area like room, building, or colleges. Nowadays instead of cables, wireless media are used as a data transmission channel. LAN, where wireless media are used, is known as Wireless Local Area Network.



Metropolitan Area Network (MAN)

It is larger network than LAN. Metropolitan Area Network (MAN) is a network of computers within a city or between neighboring cities. Big companies like banks, offices etc use MAN. In MAN, cables and unbounded communication media are used as the transmission channels.



Wide Area Network (WAN)

A wide area network (WAN) is a very large network of computers. WAN is a network of computers in a wide geographical area such as country, neighboring countries, continent etc. A WAN can be formed by joining many LANs and WANs. The Internet and Intranet are the WANs.

NETWORK TOPOLOGY

The arrangement or connection patterns of computers or nodes or devices used in the network is known as network topology. There are five types of common network topology:

1. Bus topology
2. Star Topology
3. Ring topology
4. Mesh Topology
5. Hybrid Topology

Bus Topology



In this topology, all the computers are connected to a single cable.

Advantages:

1. It is inexpensive and easy to install because all the computers in the network are attached to one single cable.
2. The failure of one computer does not affect the performance of the rest of the networks
3. Computers may be easily added or removed from the network.

Disadvantages

1. If a problem arises at any point of the cable, the entire network goes down.
2. It tends to slow down under a heavy load.
3. In this topology, troubleshooting could be difficult.

Ring topology



In this topology, all the computers or devices are connected to each other in a closed loop by single communication cable. Data transfer takes place in one direction from one node to another around the ring. It is also called loop network.

Advantages:

1. Each computer does not have to depend on the central device as each computer controls transmission to and from itself.
2. It has short cable connection which increases network reliability.
3. It supports very high data transmission rate.

Disadvantages:

1. It is difficult to change network structure.
2. If a single computer fails, at least a portion of the network won't work.

Mesh Topology



It is a point to point connection between every device in the network.

Advantages:

- 1. Failure of a device does not affect the data transmission to the destination device.
- 2. Easy to troubleshoot

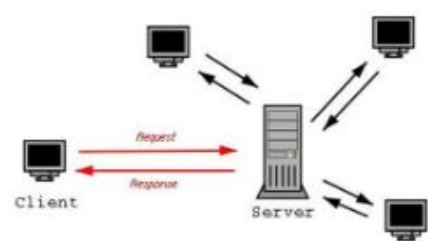
Disadvantages:

- 1. It is difficult to set up.
- 2. It is more expensive than other topology.

NETWORK ARCHITECTURE

The networking architecture or network model specifies how computers on the network interact and communicate with each other. The network of the personal computers may use Client-server Network or Peer-to-Peer Network.

Client Server Network



In it, computers are connected to a central device (server) and communication is done through it. The server is the main computer which provides services to the workstation. The server computer provides resources to the workstations when the request is made. An unauthorized person cannot access the resources of the server. There are different types of server like print server, file server and network server, etc.

Advantages of Client-Server Network Model

- Only an authorized person can access the resources of the network.
- It is more secure than the peer-to-peer network.
- All the workstations can be managed from a single server computer.
- The required application can be installed on the server computer instead on the individual workstation.

Disadvantages of Client-Server Network

- All the workstation has to depend upon server computer.
- It is difficult to set up the client-server network.
- A trained administrator is required to handle it.

Peer to Peer Network



It is sometimes called workgroups. In this network, all the computers have equal responsibilities. Each computer has access to at least some of the resources on all the computer. Each computer in this network has equal right. It is suitable for the only small geographical area such as small rooms, building, school, etc.

Advantages of Peer-to-Peer Network

- It is easy to set up a peer-to-peer network than a client-server network.
- Each computer in the network has equal right and can determine resources to be shared.

Disadvantages of Peer-to-Peer Network

- It has low-level security than the client-server network.
- The expansion of the network is limited.
- The network performances degrade with a heavy load.

TERM RELATED TO NETWORKING

Internet



The internet is the largest network that connects millions of computer around the world. It is also known as network of the networks. It provides data, information and other services to the client computers. A computer can be connected to the Internet using Integrated Service Digital Network (ISDN), cable line, leased line or satellite. Advance Research Projects Agency Network was established in 1969 A.D. In 1980 A.D., NSF Net(National Science Foundation) established developed different type of network. These two networks along with other small networks merged together and developed internet in 1990 A.D.

World Wide Web



The world wide web which is also known as web is one of the popular services on the Internet. The WWW provides the millions of information on various topics. There are millions of websites on the web which provide information. Each website is identified by the Internet Address or Uniform Resource Locator (URL). There are some web sites which search the information on the web on the basis of the keyword. Such sites are known as Search Engines. Google.com, Bing.com etc are some of the examples search engines.

Web Browser

The web browser is one of the software application for retrieving, presenting and traversing information resources on the world wide web. Web browser helps the user to interact with internet. We can jump from one page to another page by the help of hyperlink in a web browser. The web browser is of two types. They are:

Graphical browser: This type of browser can run text, graphics, audio, video and animation. (E.g. firefox, internet explorer, chrome etc.)

Text only browser: This type of browser can run text only. (E.g. lynx)

Web Server

Web servers are those computers that deliver web pages. Each web server has its own IP address. The web server can run different types of the web page and database.

Web Site



A web site is a group of web pages that have information about various content having similar subject materials. For instance, the website would have a name (subject) such as GoodFords.com and have several pages related to good Ford vehicles. The website has a main web page commonly called the Homepage (index.html or default.html). The site's address will display the homepage and you can click on hyperlinks to go to other pages on the website.

How to search on Internet?

The search engine is a program in a database that is used especially for finding particular sites on the World Wide Web. Some examples of search engines are www.google.com, www.yahoo.com etc.

Steps to search:

Type URL name or name of search engine on the address bar of any web browser.

You can choose any web link or image link in the search engine.