



SRI COMPUTER EDUCATION(SIMTECH)

Internet

The **Internet** is a global system of interconnected computer networks that use the standard Internet protocol suite (*TCP/IP*) to serve several billion users worldwide. It is a *network of networks* that consists of millions of private, public, academic, business, and government networks, of local to global scope, that are linked by a broad array of electronic, wireless and optical networking technologies. The Internet carries an extensive range of information resources and services, such as the inter-linked hypertext documents of the World Wide Web (WWW), the infrastructure to support email, and peer-to-peer networks.

intranet

An **intranet** is a **computer network** that uses **Internet Protocol** technology to share information, operational systems, or computing services within an organization. This term is used in contrast to *internet*, a network between organizations, and instead refers to a network within an organization. Sometimes, the term refers only to the organization's internal **website**, but may be a more extensive part of the organization's information technology infrastructure, and may be composed of multiple **local area networks**. The objective is to organize each individual's desktop with minimal cost, time and effort to be more productive, cost efficient, timely, and competitive.

CCC Internet Notes

Local area network (LAN)

A **local area network (LAN)** is a computer network that interconnects computers in a limited area such as a home, school, computer laboratory, or office building using network media.[1] The defining characteristics of LANs, in contrast to wide area networks (WANs), include their usually higher data-transfer rates, smaller geographic area, and lack of a need for leased telecommunication lines.

Metropolitan area network (MAN)

A **metropolitan area network (MAN)** is a computer network in which two or more computers or communicating devices or networks which are geographically separated but in same metropolitan city and are connected to each other are said to be connected on MAN. The limits of Metropolitan cities are determined by local municipal corporations and we cannot define them. Hence, the bigger the Metropolitan city the bigger the MAN, smaller a metro city smaller the MAN.

Wide area network (WAN)

A **wide area network (WAN)** is a network that covers a broad area (i.e., any telecommunications network that links across metropolitan, regional, or national boundaries) using private or public network transports. Business and government entities utilize WANs to relay data among employees, clients, buyers, and suppliers from various geographical locations. In essence, this mode of telecommunication allows a business to effectively carry out its daily function regardless of location. The Internet can be considered a WAN as well, and is used by businesses, governments, organizations, and individuals for almost any purpose imaginable.[1]

Campus area network

A **campus network, campus area network, corporate area network** or **CAN** is a computer network made up of an interconnection of local area networks (LANs) within a limited geographical area.[1][2] The networking equipments (switches, routers) and transmission media (optical fiber, copper plant, Cat5 cabling etc.) are almost entirely owned by the campus tenant / owner: an enterprise, university, government etc.[3]

Personal area network (PAN)

A **personal area network (PAN)** is a computer network used for communication among computerized devices, including telephones and personal digital assistants. PANs can be used for communication among the personal devices themselves (intrapersonal communication), or for connecting to a higher level network and the Internet (an uplink). A wireless personal area network (WPAN) is a PAN carried over wireless network technologies such as IrDA, Wireless USB, Bluetooth, Z-Wave, ZigBee, or even Body Area Network. The reach of a WPAN varies from a few centimeters to a few meters. A PAN may also be carried over wired computer buses such as USB and FireWire.

Desk Area Network (DAN)

The Desk Area Network (DAN) is a multimedia workstation based around an ATM interconnect (as shown in the above diagram). All communication between peripherals and even between the CPU and its main memory is achieved by sending ATM cells through a switch fabric. A prototype implementation based on the Fairisle switch fabric has been built and is being used to investigate the architecture.

Topology

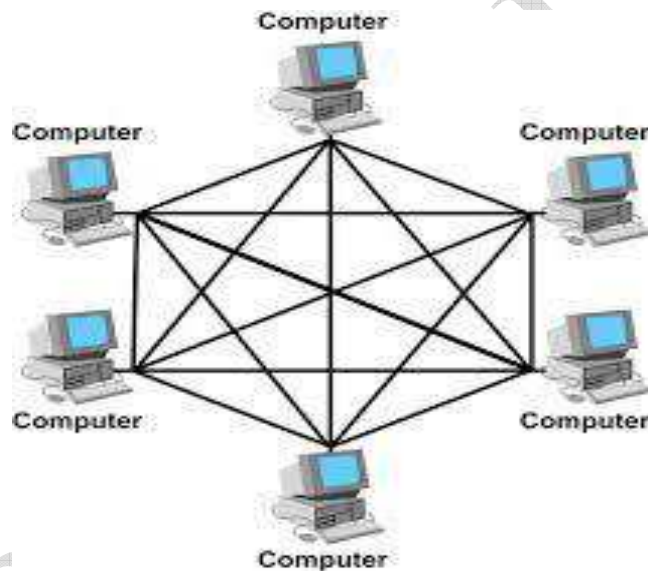
Network topology is the arrangement of the various elements (links, nodes, etc.) of a computer[1][2] or biological network.[3] Essentially, it is the topological[4] structure of a network, and may be depicted physically or logically. Physical topology refers to the placement of the network's various components, including device location and cable installation, while logical topology shows how data flows within a network, regardless of its physical design. Distances

between nodes, physical interconnections, transmission rates, and/or signal types may differ between two networks, yet their topologies may be identical

A good example is a local area network (LAN): Any given node in the LAN has one or more physical links to other devices in the network; graphically mapping these links results in a geometric shape that can be used to describe the physical topology of the network. Conversely, mapping the data flow between the components determines the logical topology of the network.

Mesh topology

A network setup where each computer and network device is interconnected with one another, allowing for most transmissions to be distributed, even if one of the connections go down. This topology is not commonly used for most computer networks as it is difficult and expensive to have redundant connection to every computer. However, this topology is commonly used for wireless networks. Below is a visual example of a simple computer setup on a network using a mesh topology.



Advantages of Mesh topology

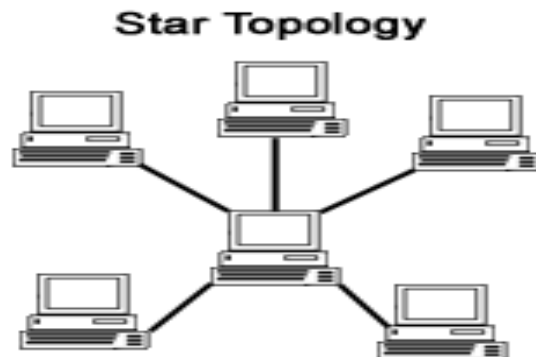
- 1) Data can be transmitted from different devices simultaneously. This topology can withstand high traffic.
- 2) Even if one of the components fails there is always an alternative present. So data transfer doesn't get affected.
- 3) Expansion and modification in topology can be done without disrupting other nodes.

Disadvantages of Mesh topology

- 1) There are high chances of redundancy in many of the network connections.
- 2) Overall cost of this network is way too high as compared to other network topologies.
- 3) Set-up and maintenance of this topology is very difficult. Even administration of the network is tough.

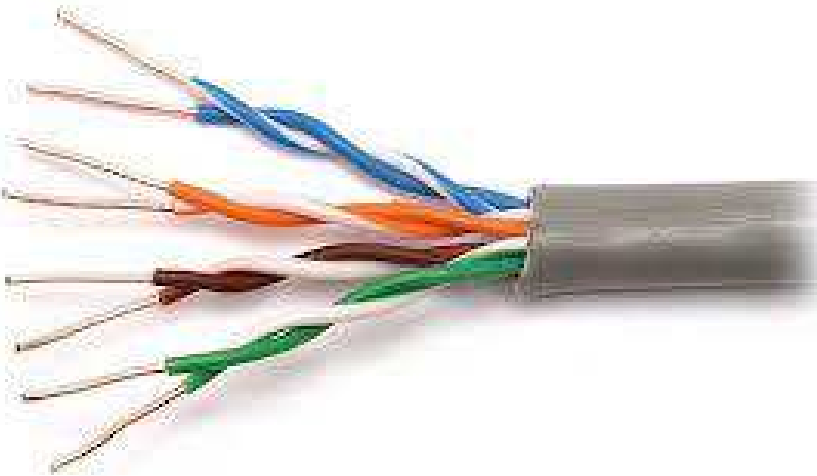
Star Topology

Alternatively referred to as a star network, a star topology is one of the most common network setups where each of the devices and computers on a network connect to a central hub. A major disadvantage of this network topology is that if the central hub fails, all computers connected to that hub would be disconnected. Below is a visual example of a simple computer setup on a network using the star topology?



Twisted Pair

A type of cable that consists of two independently insulated wires twisted around one another. The use of two wires twisted together helps to reduce crosstalk and electromagnetic induction. While twisted-pair cable is used by older telephone networks and is the least expensive type of local-area network (LAN) cable, most networks contain some twisted-pair cabling at some point along the network. Other types of cables used for LANs include coaxial cables and fiber optic cables.



Unshielded Twisted Pair cable

UTP stands for Unshielded Twisted Pair cable. UTP cable is a 100 ohm copper cable that consists of 2 to 1800 unshielded twisted pairs surrounded by an outer jacket. They have no metallic shield. This makes the cable small in diameter but unprotected against electrical interference. The twist helps to improve its immunity to electrical noise and EMI.

Shielded Twisted Pair cable

Often abbreviated *STP*, a type of copper telephone wiring in which each of the two copper wires that are twisted together are coated with an insulating coating that functions as a ground for the wires. The extra covering in shielded twisted pair wiring protects the transmission line from

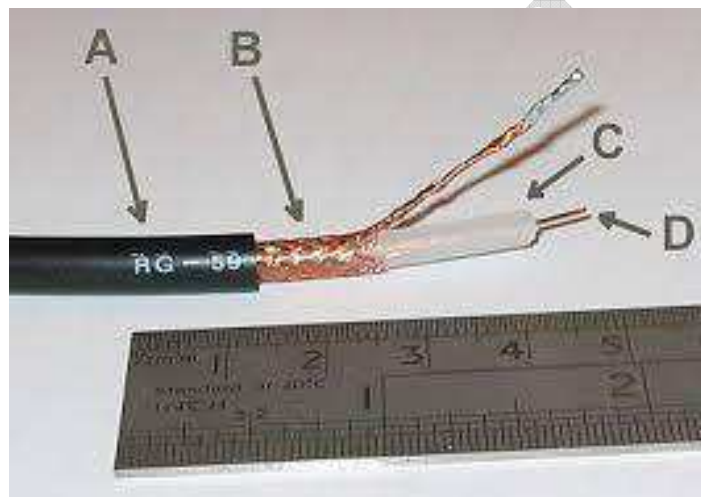
electromagnetic interference leaking into or out of the cable. STP cabling often is used in Ethernet networks, especially fast data rate Ethernets.

Advantages:

1. Cheaper and far easier to splice
2. Less susceptible to electrical interference caused by nearby equipment or wires.
3. In turn are less likely to cause interference themselves.
4. Because it is electrically "cleaner", STP wire can carry data at a faster speed.

Disadvantages: 1. STP wire is that it is physically larger and more expensive than twisted pair wire.
2. STP is more difficult to connect to a terminating block.

Coaxial Cable A type of wire that consists of a center wire surrounded by insulation and then a grounded shield of braided wire. The shield minimizes electrical and radio frequency interference. Coaxial cabling is the primary type of cabling used by the cable television industry and is also widely used for computer networks, such as Ethernet. Although more expensive than standard telephone wire, it is much less susceptible to interference and can carry much more data.



Advantages

- sufficient frequency range to support multiple channel, which allows for much greater throughput.
- lower error rates. because the inner conductor is in a Faraday shield, noise immunity is improved, and coax has a lower error rates and therefore slightly better performance than twisted pair.
- greater spacing between amplifiers coax's cable shielding reduces noise and crosstalk, which means amplifiers can be spaced farther apart than with twisted pair.

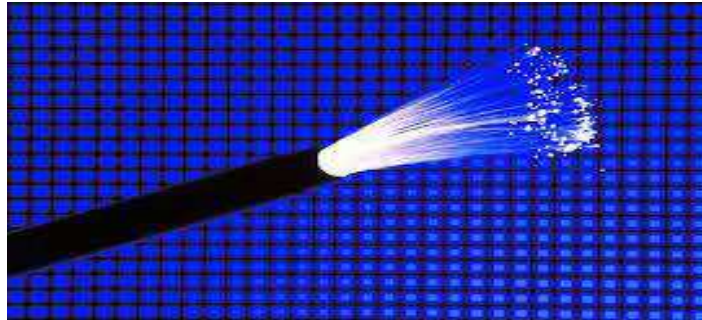
Disadvantages

- more expensive to install compare to twisted pair cable.
- the thicker the cable, the more difficult to work with.
- Home > fiber optics

Fiber optics

A technology that uses glass (or plastic) threads (fibers) to transmit data. A fiber optic cable consists of a bundle of glass threads, each of which is capable of transmitting messages modulated onto light waves.

Fiber optics has several advantages over traditional metal communications lines:



The main disadvantage of fiber optics is that the cables are expensive to install. In addition, they are more fragile than wire and are difficult to splice.

Fiber optics is a particularly popular technology for local-area networks. In addition, telephone companies are steadily replacing traditional telephone lines with fiber optic cables. In the future, almost all communications will employ fiber optics.

Advantages

- system performance
- greatly increased bandwidth and capacity
- lower signal attenuation (loss)
- immunity to electrical noise
- immune to noise (electromagnetic interference and radio frequency interference)
- less restrictive in harsh environments
- overall system economy

Disadvantages

- fiber optic component are expensive
- fiber optic transmitters and receivers are still relatively expensive compared to electrical interfaces
- the lack of standardization in the industry has also limited the acceptance of fiber optics.

Radio waves

Radio waves are part of a larger group of waves classified all together as electromagnetic radiation. This large group of waves is broken down into smaller groups based upon their frequencies and wavelengths. Two examples of electromagnetic radiation (other than radio waves) are: ISDN (integrated services digital network)

Abbreviation of *integrated services digital network*, an international communications standard for sending voice, video, and data over digital telephone lines or normal telephone wires. ISDN supports data transfer rates of 64 Kbps (64,000 bits per second). Packet Switching

Refers to protocols in which messages are divided into packets before they are sent. Each packet is then transmitted individually and can even follow different routes to its destination. Once all the packets forming a message arrive at the destination, they are recompiled into the original message. Most modern Wide Area Network (WAN) protocols, including TCP/IP, X.25, and Frame Relay, are based on packet-switching technologies. In contrast, normal telephone service is based on a circuit-switching technology, in which a dedicated line is allocated for transmission between two parties. Circuit-switching is ideal when data must be transmitted quickly and must arrive in the same order in which it's sent. This is the case with most real-time data, such as live audio and video. Packet switching is more efficient and robust for data that can withstand some delays in transmission, such as e-mail messages and Web pages.

Circuit switching

A type of communications in which a dedicated channel (or *circuit*) is established for the duration of a transmission. The most ubiquitous circuit-switching network is the telephone system, which links together wire segments to create a single unbroken line for each telephone call.

The other common communications method is packet switching, which divides messages into packets and sends each packet individually. The Internet is based on a packet-switching protocol, TCP/IP.

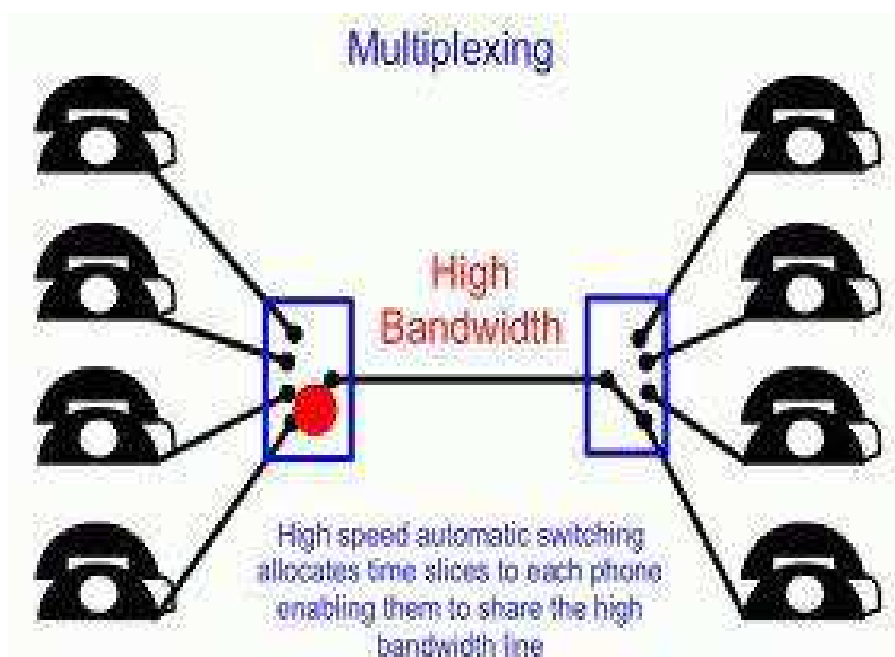
Circuit-switching systems are ideal for communications that require data to be transmitted in real-time. Packet-switching networks are more efficient if some amount of delay is acceptable.

Circuit-switching networks are sometimes called *connection-oriented* networks. Note, however, that although packet switching is essentially connectionless, a packet switching network can be made connection-oriented by using a higher-level protocol. TCP, for example, makes IP networks connection-oriented.

Multiplexing

In telecommunications and computer networks, multiplexing (also known as muxing) is a method by which multiple analogue message signals or digital data streams are combined into one signal over a shared medium. The aim is to share an expensive resource. For example, in telecommunications, several telephone calls may be carried using one wire. Multiplexing originated in telegraphy in the 1870s, and is now widely applied in communications. In telephony, George Owen Squier is credited with the development of telephone carrier multiplexing in 1910.

The multiplexed signal is transmitted over a communication channel, which may be a physical transmission medium. The multiplexing divides the capacity of the high-level communication channel into several low-level logical channels, one for each



message signal or data stream to be transferred. A reverse process, known as demultiplexing, can extract the original channels on the receiver side.

A device that performs the multiplexing is called a **multiplexer (MUX)**, and a device that performs the reverse process is called a **demultiplexer (DEMUX)**.

Inverse multiplexing (IMUX) has the opposite aim as multiplexing, namely to break one data stream into several streams, transfer them simultaneously over several communication channels, and recreate the original data stream.

Protocol

A protocol is a system of rules that define how something is to be done. In **computer** terminology, a protocol is usually an agreed-upon or standardized method for transmitting **data** and/or establishing communications between different devices. Just as two humans need to have a common language between them before they can begin to share ideas and information, so must computers have a common way of sending information between them. The **Internet** is often used as an example of a successful protocols-based system in which the implementation of key qualities of protocols, such as error correction and message formatting, are utilized and respected across a wide variety of **hardware** and **software**.

URL

A **uniform resource locator**, abbreviated **URL**, also known as **web address**, is a specific character string that constitutes a reference to a resource. In most web browsers, the URL of a web page is displayed on top inside an address bar. An example of a typical URL would be "http://en.example.org/wiki/Main_Page". A URL is technically a type of uniform resource identifier (URI), but in many technical documents and verbal discussions, URL is often used as a synonym for URI, and this is not considered a problem.

TCP

Transmission Control Protocol/Internet Protocol, the suite of communications protocols used to connect hosts on the Internet. TCP/IP uses several protocols, the two main ones being TCP and IP. TCP/IP is built into the UNIX operating system and is used by the Internet, making it the de facto standard for transmitting data over networks. Even network operating systems that have their own protocols, such as Netware, also support TCP/IP.

IP

The **Internet Protocol (IP)** is the principal communications protocol in the Internet protocol suite for relaying datagrams across network boundaries. Its routing function enables internetworking, and essentially establishes the Internet.

HTML

Short for **HyperText Markup Language**, the authoring language used to create documents on the World Wide Web. HTML is similar to SGML, although it is not a strict subset.

HTML defines the structure and layout of a Web document by using a variety of tags and attributes. The correct structure for an HTML document starts with <HTML><HEAD>(enter here what document is about)<BODY> and ends with </BODY></HTML>. All the information you'd like to include in your Web page fits in between the <BODY> and </BODY> tags. There are hundreds of other tags used to format and layout the information in a Web page. Tags are also used to specify hypertext links. These allow Web developers to direct users to other Web pages with only a click of the mouse on either an image or word(s). For a more complete list of tags, check out some of the URLs below.

HTTP

The Hypertext Transfer Protocol (HTTP) is an application protocol for distributed, collaborative, hypermedia information systems.[1] HTTP is the foundation of data communication for the World Wide Web.

Hypertext is structured text that uses logical links (hyperlinks) between nodes containing text. HTTP is the protocol to exchange or transfer hypertext.

The standards development of HTTP was coordinated by the Internet Engineering Task Force (IETF) and the World Wide Web Consortium (W3C), culminating in the publication of a series of Requests for Comments (RFCs), most notably RFC 2616 (June 1999), which defines HTTP/1.1, the version of HTTP in common use.

SMTP

Simple Mail Transfer Protocol, a protocol for sending e-mail messages between servers. Most e-mail systems that send mail over the Internet use SMTP to send messages from one server to another; the messages can then be retrieved with an e-mail client using either POP or IMAP. In addition, SMTP is generally used to send messages from a mail client to a mail server. This is why you need to specify both the POP or IMAP server and the SMTP server when you configure your e-mail application.

IP

IP, as the primary protocol in the Internet layer of the Internet protocol suite, has the task of delivering packets from the source host to the destination host solely based on the IP addresses. For this purpose, IP defines datagram structures that encapsulate the data to be delivered. It also defines addressing methods that are used to label the datagram with source and destination information.

FTP

File Transfer Protocol (FTP) is a standard network protocol used to transfer files from one host to another host over a TCP-based network, such as the Internet.

Client

A client is a piece of computer hardware or software that accesses a service made available by a server. The server is often (but not always) on another computer system, in which case the client accesses the service by way of a network.[1] The term applies to programs or devices that are part of a client-server model.

Server

A server is a system (software and suitable computer hardware) that responds to requests across a computer network to provide, or help to provide, a network service. Servers can be run on a dedicated computer, which is also often referred to as "the server", but many networked computers are capable of hosting servers. In many cases, a computer can provide several services and have several servers running.

Electronic mail

Electronic mail, most commonly referred to as email or e-mail since approximately 1993,[2] is a method of exchanging digital messages from an author to one or more recipients. Modern email operates across the Internet or other computer networks. Some early email systems required that the author and the recipient both be online at the same time, in common with instant messaging. Today's email systems are based on a store-and-forward model. Email servers accept, forward, deliver, and store messages. Neither the users nor their computers are required to be online simultaneously; they

need connect only briefly, typically to an email server, for as long as it takes to send or receive messages.

Writer-RAJNISH SIR

Advantages of emails

- Emails are easy to use. You can organize your daily **correspondence**, send and receive electronic messages and save them on computers.
- Emails are fast. They are **delivered** at once around the world. No other form of written communication is as fast as an email.
- The language used in emails is simple and **informal**.
- When you **reply** to an email you can **attach** the original message so that when you answer the **recipient** knows what you are talking about. This is important if you get hundreds of emails a day.
- It is possible to send **automated** emails with a certain text. In such a way it is possible to tell the sender that you are on vacation. These emails are called auto responders.
- Emails do not use paper. They are **environment** friendly and save a lot of trees from being cut down.
- Emails can also have pictures in them. You can send birthday cards or newsletters as emails.
- Products can be advertised with emails. Companies can **reach** a lot of people and inform them in a short time.

Disadvantages of emails

- Emails may carry viruses. These are small programs that harm your computer system. They can read out your email address book and send themselves to a number of people around the world.
- Many people send unwanted emails to others. These are called spam mails. It takes a lot of time to **filter out** the unwanted emails from those that are really important.
- Emails cannot really be used for official business documents. They may be lost and you cannot **sign** them.
- Your mailbox may get **flooded** with emails after a certain time so you have to empty it from time to time.

Web browser

A **web browser** (commonly referred to as a **browser**) is a software application for retrieving, presenting and traversing information resources on the World Wide Web. An *information resource* is identified by a Uniform Resource Identifier (URI) and may be a web page, image, video or other piece of content.[1] Hyperlinks present in resources enable users easily to navigate their browsers to related resources **Example** :. Google Chrome, Mozilla Firefox, Safari, Opera, Internet Explorer, Netscape Browser

Cookies

A message given to a Web browser by a Web server. The browser stores the message in a text file. The message is then sent back to the server each time the browser requests a page from the server. The main purpose of cookies is to identify users and possibly prepare customized Web pages for them. When you enter a Web site using cookies, you may be asked to fill out a form providing such information as your name and interests. This information is packaged into a cookie and sent to your Web browser which stores it for later use. The next time you go to the same Web site, your browser will send the cookie to the Web server. The server can use this information to present you

with custom Web pages. So, for example, instead of seeing just a generic welcome page you might see a welcome page with your name on it.

Search engine

A web search engine is a software system that is designed to search for information on the World Wide Web. The search results are generally presented in a line of results often referred to as search engine results pages (SERPs). The information may be a specialist in web pages, images, information and other types of files. Some search engines also mine data available in databases or open directories. Unlike web directories, which are maintained only by human editors, search engines also maintain real-time information by running an algorithm on a web crawler. Example : Google, Yahoo, Bing, AltaVista

Social networking service

A social networking service is a platform to build social networks or social relations among people who, for example, share interests, activities, backgrounds, or real-life connections. A social network service consists of a representation of each user (often a profile), his/her social links, and a variety of additional services. Most social network services are web-based and provide means for users to interact over the Internet, such as e-mail and instant messaging. Online community services are sometimes considered as a social network service, though in a broader sense, social network service usually means an individual-centered service whereas online community services are group-centered. Social networking sites allow users to share ideas, pictures, posts, activities, events, and interests with people in their network.

Facebook

Facebook is an online social networking service, whose name stems from the colloquial name for the book given to students at the start of the academic year by some university administrations in the United States to help students get to know each other.[7] It was founded in February 2004 by Mark Zuckerberg with his college roommates and fellow Harvard University students Eduardo Saverin, Andrew McCollum, Dustin Moskovitz and Chris Hughes.[8] The website's membership was initially limited by the founders to

Harvard students, but was expanded to other colleges in the Boston area, the Ivy League, and Stanford University. It gradually added support for students at various other universities before opening to high school students, and eventually to anyone aged 13 and over. Facebook now allows any users who declare themselves to be at least 13 years old to become registered users of the site.

Twitter

Twitter is an online social networking service and microblogging service that enables its users to send and read text-based messages of up to 140 characters, known as "tweets".

More...