COMPUTER INFO-GALLERY

VOLUME - 6

(2017-18)

Students' Assignments as IT Encyclopedia

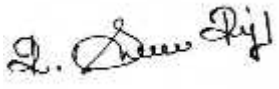
PREFACE

This book is intended to make the New-Comers (Students) of the Department of Computer Science (UG), who does not have the ideas regarding the basics of the Computer and its terminologies. It can also help the students from computer backdrop, to make a review regarding the IT terminologies and concepts. Already 5 Volumes has been launched during 2012-2017.

The thought of publishing this book arises as a sparkle to make the Student's Assignments, in an organized manner. I had an idea that, if the topics given to the students to prepare their Assignments are non-repetitive, then they may do the task without copying others' content. Then, I thought why it shouldn't be combined together in the form of a book, which will help other students also. That is how this book got emerged. This is the 6th Volume for the academic year 2017-18 with some other useful contents to make the students very well equipped in the foundation level especially for the students who come into the area of Autonomous.

The copy of this book will be maintained in the Department Library and also the e-content of this has been posted in our college website. I hereby deliver my heartfelt thanks to the most honorable Correspondent Sir, the respected Principal Sir, and the beloved H.O.D. (CS) Prof .P.Ramesh sir, who gave me the freedom, to conduct an activity of this kind. I thank my colleagues and my senior faculty members who have given me a moral support. I also thank my dear students for their co-operation. I hereby assure that the Department of Computer Science (UG) will always find ways for the betterment of the Students.

Thanking You,



INFO- GALLERY IN-CHARGE

(R. Sundar Raj)

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BEST WISHES

To all your present and future innovations for the betterment of our students and the Institution……

H.O.D **Principal** **Correspondent**

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01. DOT MATRIX PRINTER

Definition:

A Type of computer printer that uses tiny hammers in its print head to strike pins over an inked ribbon to form characters or images on paper, and it is used mainly for multipart forms. For general printing, dot matrix printers have largely been replaced by cheaper, quieter, and faster non-impact printers such as ink jets and lasers, which also produce output of far better quality. However, they can print to multi-page forms (that is, carbon copies), something laser and ink-jet printers cannot do.

Dot-matrix printers vary in two important characteristics:

Speed:

Given in characters per second (cps), the speed can vary from about 50 to over 500 cps. Most dot-matrix printers offer different speeds depending on the quality of print desired.

Print quality:

Determined by the number of pins (the mechanisms that print the dots), it can vary from 9 to 24. The best dot-matrix printers (24 pins) can produce near letter-quality type, although you can still see a difference if you look closely.

Advantages of dot-matrix printers:

- Dot-matrix printers are really less expensive. As they are so cheap it is easy to buy and use.
- The maintenance cost of dot-matrix printer is also low.
- The cost of printing of dot-matrix printer is also low.
- The price of ink ribbon of dot-matrix printer is also less and the lasting time is high.
- Dot-matrix printers last for a long period of time and it do not need replacement soon as they are very robust.
- The inks of dot-matrix printers do not finish up rapidly like ink of other printers do. It gives hint before getting emptied.
- The quality starts fading slowly and that’s the time when you know you need to refill the ink.
- Dot-matrix printers are very strong and that it is the reason that they can also be used in the rough environment like industrial establishment.

Disadvantages of dot-matrix printers:

- The quality that dot matrix printer possesses is very low.
- Dot-matrix printer enables color printing but the quality of that color printing is also low. In addition, due to this low quality issues dot-matrix printers are not suitable for many kind of printouts.
- Dot-matrix printer creates a lot of noise while printing and thus it is very annoying and disturbing.
- The work of handling paper jams is very tedious.
- The speed of operating dot matrix printers is less when compared to ink jet printer and laser printer.
- There is possibility of print heads getting damaged due to bending of pins.

Types of dot-matrix printers:

Digital then broadened the basic LA36 line onto a wide variety of dot matrix printers including:

LA180: 180 c/s line printer,

LS120: 120 c/s terminal,

LA120: 180 c/s advanced terminal,

LA34: Cost-reduced terminal,

LA38: An LA34 with more features,

LA12: A portable terminal.

02. FILE TRANSFER PROTOCOL (FTP)

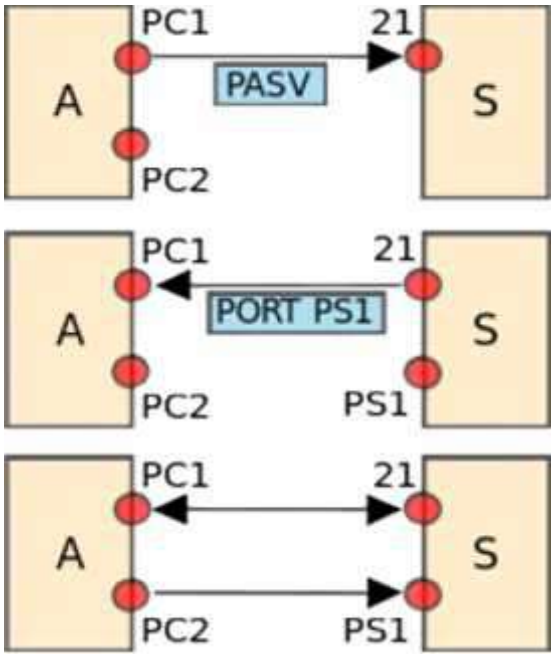
Introduction:

File Transfer Protocol (FTP) is a standard Internet protocol for transmitting files between computers on the Internet over TCP/IP connections.

FTP is a client-server protocol that relies on two communications channels between client and server: a command channel for controlling the conversation and a data channel for transmitting file content.

Clients initiate conversations with servers by requesting to download a file. Using FTP, a client can upload, download, delete, rename, move and copy files on a server.

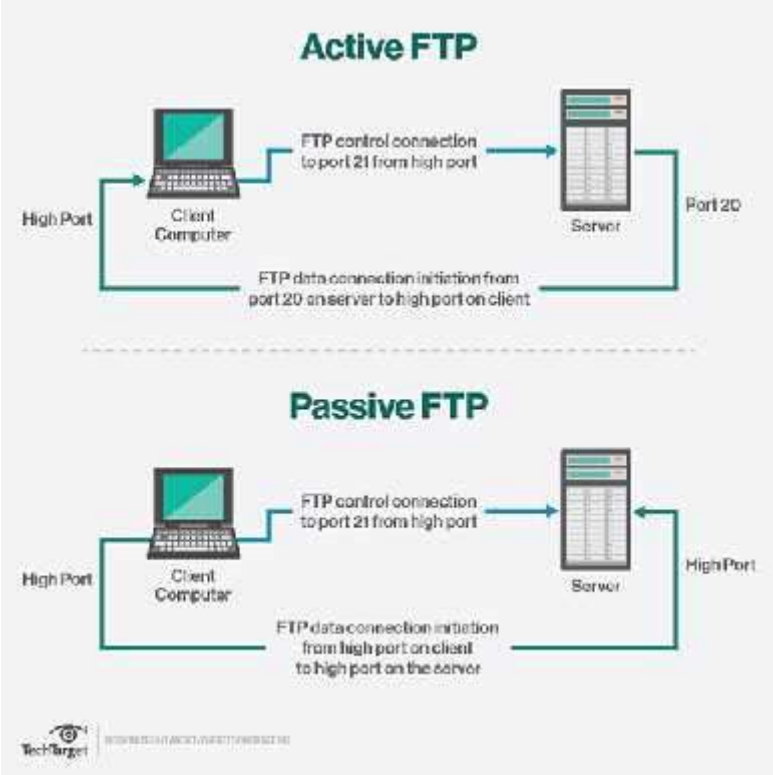
Protocol overview-communication and data transfer:



FTP reply codes:

- 2yz – Success reply
- 4yz or 5yz – Failure reply
- 1yz or 3yz – Error or Incomplete reply
- The s x0z – Syntax. These replies refer to syntax errors.
- x1z – Information. Replies to requests for information.
- x2z – Connections. Replies referring to the control and data connections.

- x3z – Authentication and accounting. Replies for the login process and accounting procedures.
- x4z – Not defined.
- x5z – File system. These replies relay status codes from the server file system. The third digit of the reply code is used to provide additional detail for each of the categories defined by the second digit.



FTP Servers:

- FileZilla Server (Windows)
- Pure-FTPd (Unix)
- VsFTPd (Unix)
- ProFTPd (Unix)

FTP over SSH:

FTP over SSH is the practice of tunneling a normal FTP session over a Secure Shell connection. Because FTP uses multipleTCP connections (unusual for a TCP/IP protocol that is still in use), it is particularly difficult to tunnel over SSH. data is transferred, the FTP software at either end sets up new TCP connections (data channels) and thus have no confidentiality or integrity protection.

03. FOREIGN KEY

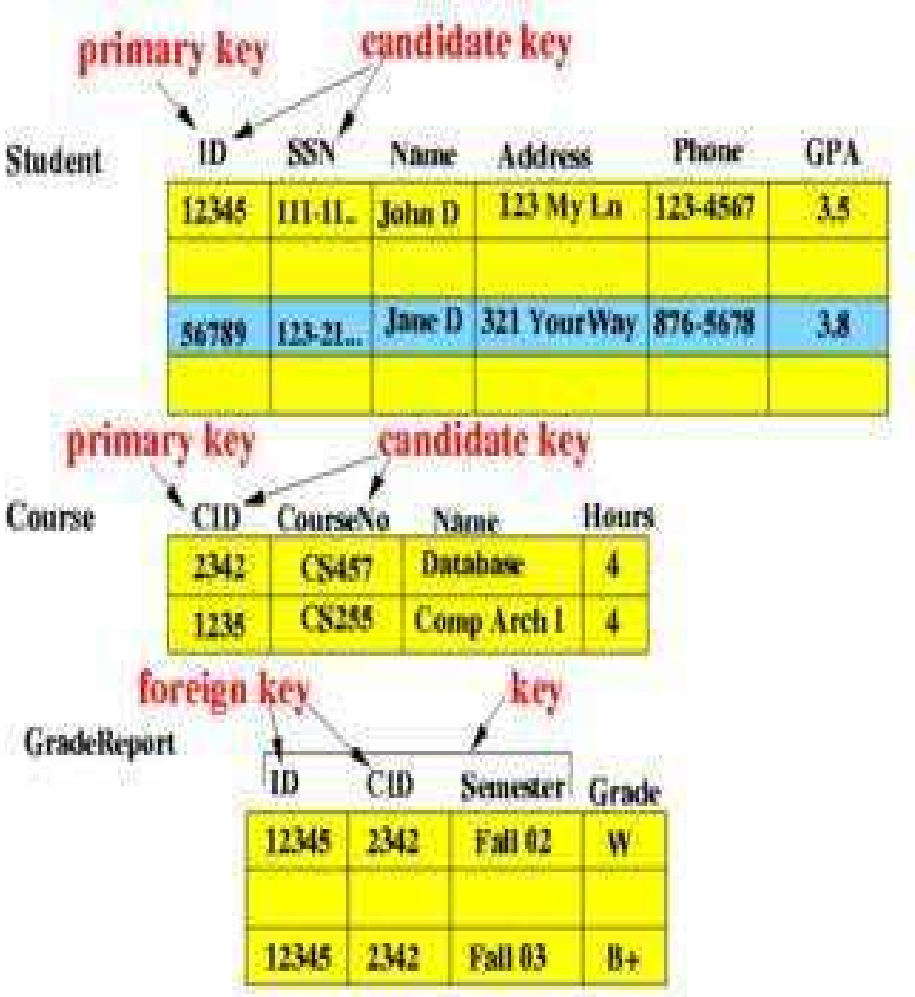
Definition:

A Foreign key is a column or group of columns in a relational database table that provides a link between data in two tables.

It acts as a cross-reference between tables because it references the primary key of another table, thereby establishing a link between them.

The majority of tables in a relational database system adhere to the foreign key concept. In complex databases and data warehouses, data in a domain must be added across multiple tables, thus maintaining a relationship between them. The concept of referential integrity is derived from foreign key theory.

Foreign keys and their implementation are more complex than primary keys.



Referential actions associated with a foreign key action:

Cascade:

When rows in the parent table are deleted, the matching foreign key columns in the child table are also deleted, creating a cascading delete.

Set null:

When a referenced row in the parent table is deleted or updated, the foreign key values in the referencing row are set to null to maintain the referential integrity.

Triggers:

Referential actions are normally implemented as triggers. In many ways, foreign key actions are similar to user-defined triggers. To ensure proper execution, ordered referential actions are sometimes replaced with their equivalent user-defined triggers.

Set default:

The foreign key values in the child table are set to the default column value when the referenced row in the parent table is deleted or updated.

Restrict:

This is the normal referential action associated with a foreign key. A value in the parent table cannot be deleted or updated as long as a foreign key in another table refers to it.

No action:

This referential action is similar in function to the "restrict" action except that a no-action check is performed only after trying to alter the table.

04. GENETIC ALGORITHMS IN DATA MINING

Introduction:

Genetic algorithm means understanding the simple, iterative processes that under pin evolutionary change GA is an algorithm which makes it easy to search a Lange search space.

Example:

Finding largest divisor of a big number by implementing this Darwinian selection to the problem only the best solution will remind thus narrowing search space.

Data mining:

First a random series of rules are set on the training dataset, which try to generalize the data into formulas. The rules are checked and the once that fit the data best are kept the rules that do not fit the data are discarded. The rules that were kept are then mutated and multiplied to create new rules.

Data classification is a two-step process:

The first step is a leaning step. In this step a classification algorithm builds the classified by analyzing a training set made up of database tupelos and their associated class labels.

Next step of classification, accuracy of a classified is predicated. For this another set of tupelos apart from training tupelos are taken called as test sets .Then these set of tupelos of test set are given as input to the classifier.

Discriminant function:

Training set-finite sample of patter with known class affiliations. Use training sets to create decision boundaries. Avoid over-fitting a training set by creating overly complex decision boundaries.

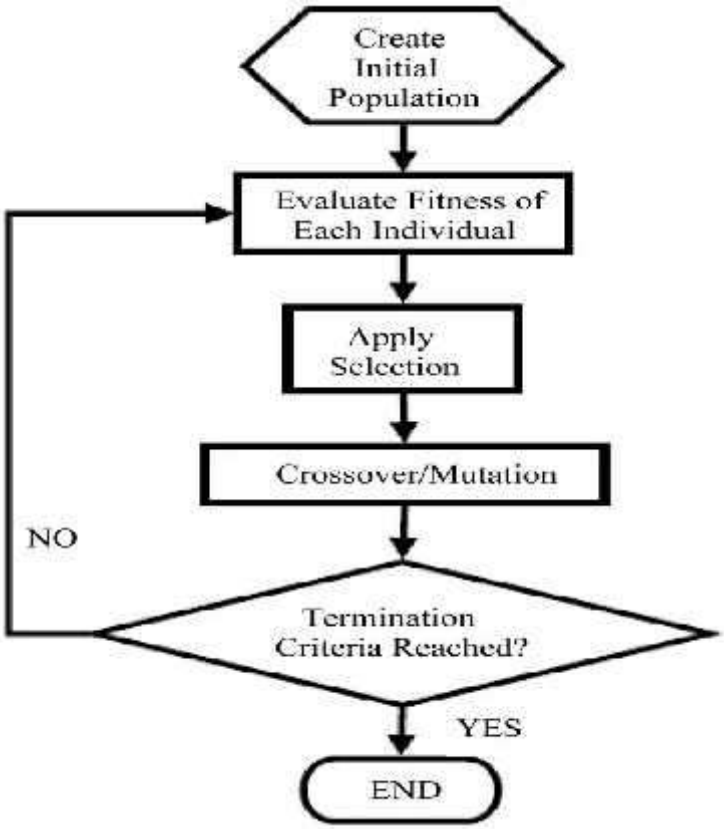
Advantages of Genetic Algorithm:

- Concepts are easy to understand.
- Genetic algorithms are intrinsically parallel.
- Always an answer, answer gets better with time.

Disadvantages of Genetic Algorithm:

- They cannot always find the exact solution but them always.
- Genetic algorithms are very slow.
- The population considered for the evolution should be moderate or suitable one for the problem (normally 20-30 or 50-100).
- Crossover rate should be 80%-95%.
- Mutation rate should be low i.e.0.5%-1% assumed as best. The method of selection should be appropriate.
- Writing if fitness function must be accurate data mining 24.

Flow chart:



Genetic algorithms are rich in application across a large and growing number of disciplines.

Genetic algorithms are used in optimization and in classification in data mining genetic algorithm has changed the way we do computer programming.

05. GLOBAL POSITIONING SYSTEM (GPS)

Definition:

GPS (Global Positioning System) is a satellite-based navigation system, which was created by U.S. Department of Defence as a part of NAVSTARsatellite program. It gives geo location and time information to a GPS receiver in all climate conditions, anywhere on or close to the Earth where there is an unobstructed line of sight to four or more GPS satellites.

For Example, Automobile tracking-utilized to identify, locate and maintain contact reports with a number of vehicles in real-time.

GPS has three segments,

- Space segment
- Control segment
- User segment

The space segment is made up of at least 24 satellites with are placed on six circular orbital planes (Four satellites per one orbit). Each orbit is inclined at an angle of 55° relative to equator plus they are separated by 60°. Satellites are at an altitude of approximately 20,200km (12,600 mi).

As of 2016, there are actually thirty-two satellites in the GPS constellation, thirty-one of which are in use. Every satellite requires 11 hours and 56 minutes to circle the earth.

The extra satellites enhance the accuracy of GPS receiver calculations by giving redundant measurements. Considering the increased number of satellites, the constellation was changed to a non-uniform set up.

The control segment handles synchronizing satellite's atomic clocks and adjusts the ephemeris of each satellite's inner orbital model. It is maintained by U.S. Air Force.

User segment is for typical users (like civil, commercial, scientific, military users, etc.) that want to make use of GPS receivers to estimate their position.

Benefits of GPS:

At present, GPS is a multi-use, space-based radio navigation system belonging to the United States government and controlled by the US Air Force to meet national defence, homeland security, and civil, commercial, and scientific requirements.

How Global Positioning System Works?

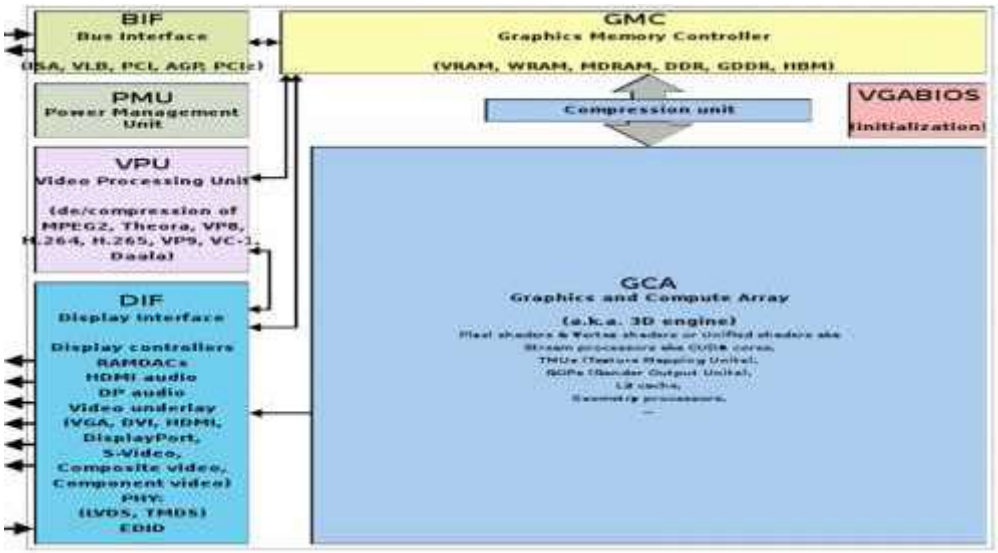
- GPS satellites circle the Earth 2 times a day in a precise orbit. GPS position is determined using data coming from satellites.
- GPS receiver computes distance to satellites and using their position calculate its own.
- To find out the distance to satellites receiver will need to have very precise clock.
- This is the primary reason why each satellite comes with an atomic clock and all those clocks should be synchronized.
- In this system, the weakest part is the GPS receiver since it has only the quartz clock and require time synchronization.
- In these modern times, GPSreceivers have the ability to receive from 12 to 20 satellite signals and make use of them to estimate the position.

06. GRAPHICS PROCESSING UNIT (GPU)

Introduction:

A graphics processing unit (GPU) is a specialized electronic circuit designed to rapidly manipulate and alter memory to accelerate the creation of images in a frame buffer intended for output to a display device. GPUs are used in embedded systems, mobile phones, personal computers, workstations, and game consoles.

Modern GPUs are very efficient at manipulating computer graphics and image processing, and their highly parallel structure makes them more efficient than general-purpose CPUs for algorithms where the processing of large blocks of data is done in parallel. In a personal computer, a GPU can be present on a video card, or it can be embedded on the motherboard or in certain CPUs on the CPU die.



PU accelerated video decoding:

Most GPUs made since 1995 support the YUV color space and hardware overlays, important for digital video playback, and many GPUs made since 2000 also support MPEG primitives such as motion compensation and iDCT. This process of hardware accelerated video decoding, where portions of the video decoding process and video post-processing are offloaded to the GPU hardware, is commonly referred to as "GPU accelerated video decoding", "GPU assisted video decoding", "GPU hardware accelerated video decoding" or "GPU hardware assisted video decoding".More recent graphics cards even decode high-definition video on the card, offloading the central processing unit.

The most common APIs for GPU accelerated video decoding are VAAPI, XvMC,and XvBA form Linux-based and UNIX-like operating systems. All except XvMC are capable of decoding videos encoded with MPEG-1, MPEG-2, MPEG-4 ASP (MPEG-4 Part 2), MPEG-4 AVC (H.264 / DivX 6), VC-1, WMV3/WMV9, Xvid / OpenDivX (DivX 4), and DivX 5 codecs, while XvMC is only capable of decoding MPEG-1 and MPEG-2.

Video decoding processes that can be accelerated:

The video decoding processes that can be accelerated by today's modern GPU hardware are:

- Motion compensation (mocomp)
- Inverse discrete cosine transform (iDCT)
- Inverse modified discrete cosine transform (iMDCT)
- In-loop deblocking filter
- Intra-frame prediction
- Inverse quantization (IQ)
- Variable-length decoding (VLD), more commonly known as slice-level acceleration
- Spatial-temporal deinterlacing and automatic interlace/progressive source detection
- Bit stream processing (Context-adaptive variable-length coding/Context-adaptive binary arithmetic coding) and perfect pixel positioning.

Hybrid graphics processing:

This newer class of GPUs competes with integrated graphics in the low-end desktop and notebook markets. The most common implementations of this are ATI's Hyper Memory and Nvidia's Turbo Cache. Hybrid graphics cards are somewhat more expensive than integrated graphics, but much less expensive than dedicated graphics cards. These share memory with the system and have a small dedicated memory cache, to make up for the high latency of the system RAM. Technologies within PCI Express can make this possible. While these solutions are sometimes advertised as having as much as 768MB of RAM, this refers to how much can be shared with the system memory.

07. HARD DISK DRIVE (HDD)

Introduction:

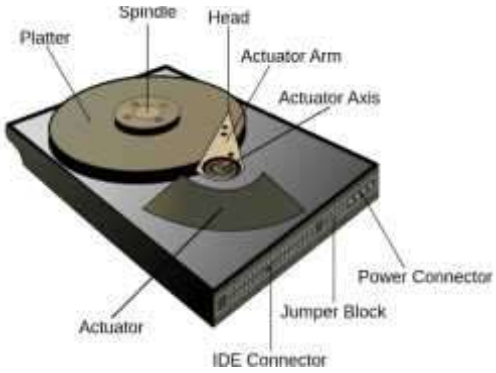
A hard disk drive (HDD), hard disk, hard drive or fixed disk is a data storage device that uses magnetic storage to store and retrieve digital information using one or more rigid rapidly rotating disks (platters) coated with magnetic material. The platters are paired with magnetic heads, usually arranged on a moving actuator arm, which read and write data to the platter surfaces. Data is accessed in a random-access manner, meaning that individual blocks of data can be stored or retrieved in any order and not only sequentially. HDDs are a type of non-volatile storage, retaining stored data even when powered off.

Introduced by IBM in 1956, HDDs became the dominant secondary storage device for general-purpose computers by the early 1960s. Continuously improved, HDDs have maintained this position into the modern era of servers and personal computers. More than 200 companies have produced HDDs historically, though after extensive industry consolidation most current units are manufactured by Seagate, Toshiba, and Western Digital. HDD unit shipments and sales revenues are declining, though production (exabytes per year) is growing. Flash memory has a growing share of the market for secondary storage, in the form of solid-state drives (SSDs). SSDs have higher data-transfer rates, higher areal storage density, better reliability, and much lower latency and access times. Though SSDs have higher cost per bit, they are replacing HDDs where speed, power consumption, small size, and durability are important.

Magnetic recording:

A modern HDD records data by magnetizing a thin film of ferromagnetic material on a disk. Sequential changes in the direction of magnetization represent binary data bits. The data is read from the disk by detecting the transitions in magnetization. User data is encoded using an encoding scheme, such as run-length limited encoding, which determines how the data is represented by the magnetic transitions.

A typical HDD design consists of a spindle that holds flat circular disks, also called platters, which hold the recorded data.



The platters are made from a non-magnetic material, usually aluminum alloy, glass, or ceramic, and are coated with a shallow layer of magnetic material typically 10–20 nm in depth, with an outer layer of carbon for protection. For reference, a standard piece of copy paper is 0.07–0.18 millimeters (70,000 –180,000 nm).

Components:

A typical HDD has two electric motors: a spindle motor that spins the disks and an actuator (motor) that positions the read/write head assembly across the spinning disks. The disk motor has an external rotor attached to the disks; the stator windings are fixed in place. Opposite the actuator at the end of the head support arm is the read-write head; thin printed-circuit cables connect the read-write heads to amplifier electronics mounted at the pivot of the actuator. The head support arm is very light, but also stiff; in modern drives, acceleration at the head reaches 550g.

The actuator is a permanent magnet and moving coil motor that swings the heads to the desired position. A metal plate supports a squat neodymium-iron-boron (NIB) high-flux magnet. Beneath this plate is the moving coil, often referred to as the voice coil by analogy to the coil in loudspeakers, which is attached to the actuator hub, and beneath that is a second NIB magnet, mounted on the bottom plate of the motor (some drives have only one magnet).

08. HOME PAGE

Introduction:

A home page is generally the main page a visitor navigating to a website from a web search engine will see, and it may also serve as a landing page to attract visitors. The home page is used to facilitate navigation to other pages on the site by providing links to prioritized and recent articles and pages, and possibly a search box. For example, a news website may present headlines and first paragraphs of top stories, with links to full articles, in a dynamic web page that reflects the popularity and recentness of stories. Meanwhile, other websites utilize the homepage to attract users to create an account. Once they are logged in, the homepage may be redirected to their profile page. This may in turn be referred to as the "personal home page".

History of home page:

In the early days of the World Wide Web in the first half of the 1990s, an important part of web pages belonged to students or teachers with a UNIX account in their university. System administrators of such systems installed an HTTP server pointing its root directory to the directory containing the users accounts. On UNIX, the base directory of an account is called "home", and the HOME environment variable contains its path (for example /home/my_username).

The URL of the home page usually has the format https://example.edu/~my_username/. Thus, the term home page appeared and then spread to its current usage.

Home page structure:

The home page is located in the root directory of a website. Most web server allow the home page to have one of several different filenames. Examples include index.html, index.htm, index.shtml, index.php, default.html, and home.html. The default filename of a website's home page can be customized on both Apache and IIS servers. Since the home page file is loaded automatically from the root directory, the home page URL does not need to include the filename.

Home page layout:

There is no standard home page layout, but most home pages include a navigation bar that provides links to different sections within the website. Other common elements found on a home page include a search bar, information about the website, and recent news or updates. Some websites include information that changes every day.

Types of home page:

I. Website Home Page.

II. Browser Home Page.

Website home page:

A website may have multiple home pages, although most have one. Wikipedia, for example, has a home page at wikipedia.org, as well as language-specific home pages, such as en.wikipedia.org and de.wikipedia.org.

Browser home page:

A home page also refers to the first page that appears upon opening a web browser, sometimes called the start page, although the home page of a website can be used as a start page. This start page can be a website, or it can be a page with various browser functions such as the display of thumbnails of frequently visited websites.

Multiple websites can be set as a start page, to open in different tabs. Some websites are intended to be used as start pages, such as google search, My Yahoo!, and MSN.com, and provide links to commonly used services such as webmail and online weather forecasts.

09. HYPER TEXT TRANSFER PROTOCOL (HTTP)

Introduction:

The Hypertext Transfer Protocol (HTTP) is an application protocol for distributed, collaborative, and hypermedia information systems. 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. Tim Berners-Lee at CERN initiated development of HTTP in 1989. 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). The first definition of HTTP/1.1, the version of HTTP in common use, occurred in RFC 2068 in 1997, although this was obsoleted by RFC 2616 in 1999 and then again by the RFC 7230 family of RFCs in 2014. A later version, the successor HTTP/2, was standardized in 2015, and is now supported by major web servers and browsers over TLS using ALPN extension where TLS 1.2 or newer is required.

Technical overview:

URL beginning with the HTTP scheme and the WWW domain name label. HTTP functions as a request–response protocolin the client–server computing model. A webbrowser, for example, may be the client and anapplication running on a computer hosting awebsite may be the server. The client submits anHTTP request message to the server. The server,which provides resources such as HTML files andother content, or performs other functions on behalf of the client, returns a response message to the client. The response contains completion status information about the request and may also contain requested content in its message body. A web browser is an example of a user agent (UA). Other types of user agent include the indexing software used by search providers (web crawlers), voice browsers, mobile apps, and other software that accesses, consumes, or displays web content.

HTTP is designed to permit intermediate network elements to improve or enable communications between clients and servers. High-traffic websites often benefit from web cache servers that deliver content on behalf of upstream servers to improve response time. Web browsers cache previously accessed web resources and reuse them when possible to reduce network traffic.

HTTP is an application layer protocol designed within the framework of the Internet protocol suite. Its definition presumes an underlying and reliable transport layer protocol, and Transmission Control Protocol (TCP) is commonly used. However, HTTP can be adapted to use unreliable protocols such as the User Datagram Protocol (UDP), for example in HTTPU and Simple Service Discovery Protocol (SSDP). HTTP resources are identified and located on the network by Uniform Resource Locators (URLs), using the Uniform Resource Identifiers (URI's) schemes http and https.

URLs and hyperlinks in HTML documents form inter-linked hypertext documents. HTTP/1.1 is a revision of the original HTTP (HTTP/1.0). In HTTP/1.0 a separate connection to the same server is made for every resource request. HTTP/1.1 can reuse a connection multiple times to download images, scripts, style sheets, etc. after the page has been delivered. HTTP/1.1 communications therefore experience less latency as the establishment of TCP connections presents considerable overhead.

HTTP authentication:

HTTP provides multiple authentication schemes such as basic access authentication and digest access authentication, which operate via a challenge-response mechanism whereby the server identifies and issues a challenge before serving the requested content. HTTP provides a general framework for access control and authentication, via an extensible set HTTP authentication of challenge-response authentication schemes, which can be used by a server to challenge a client request and by a client to provide authentication information.

10. INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT)

Introduction:

Information and communications technology (ICT)is an another/extensional term for information technology (IT) which stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), computers as well as necessary enterprise software, middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information. The term ICT is also used to refer to the convergence of audio-visual and telephone networks with computer networks through a single cabling or link system. There are large economic incentives (huge cost savings due to elimination of the telephone network) to merge the telephone network with the computer network system using a single unified system of cabling, signal distribution and management. However, ICT has no universal definition, as "the concepts, methods and applications involved in ICT are constantly evolving on an almost daily basis."

The broadness of ICT covers any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form, e.g. personal computers, digital television, email, robots. For clarity, Zuppo provided an ICT hierarchy where all levels of the hierarchy "contain some degree of commonality in that they are related to technologies that facilitate the transfer of information and various types of electronically mediated communications". Skills framework for the information age is one of many models for describing and managing competencies for ICT professionals for the 21st century.

Technological capacity:

The world's technological capacity to store information grew from 2.6 (optimally compressed) Exabyte in 1986 to 15.8 in 1993, over 54.5 in 2000, and to 295 (optimally compressed) Exabyte in 2007, and some 5 zettabytes in 2014. This is the informational equivalent to 1.25 stacks of CD-ROM from the earth to the moon in 2007, and the equivalent of 4,500 stacks of printed books from the earth to the sun in 2014.The world's technological capacity to receive information through one-way broadcast networks was 432 Exabyte of (optimally compressed) information in 1986, 715 (optimally compressed) Exabyte in 1993, 1.2 (optimally compressed).

In Education:

Information and Communication Technology can contribute to universal access to education, equity in education, the delivery of quality learning and teaching, teachers' professional development and more efficient education management, governance and administration. UNESCO takes a holistic and comprehensive approach to promoting ICT in education. Access, inclusion and quality are among the main challenges they can address. The Organization's Intersectral Platform for ICT in education focuses on these issues through the joint work of three of its sectors: Communication & Information, Education and Science.

Despite the power of computers to enhance and reform teaching and learning practices, improper implementation is a widespread issue beyond the reach of increased funding and technological advances with little evidence that teachers and tutors are properly integrating ICT into everyday learning. Intrinsic barriers such as a belief in more traditional teaching practices and individual attitudes towards computers in education as well as the teachers own comfort with computers and their ability to use them all as result in varying effectiveness in the integration of ICT in the classroom.

ICT Development Index:

The ICT Development Index ranks and compares the level of ICT use and access across the various countries around the world. In 2014, ITU (International Telecommunications Union) released the latest rankings of the IDI, with Denmark attaining the top spot, followed by South Korea. The top 30 countries in the rankings include most high-income countries where quality of life is higher than average.

11. INK JET PRINTERS

Introduction:

Inkjet printing is a type of computer printing that recreates a digital image by propelling droplets of ink onto paper, plastic, or other substrates. Inkjet printers are the most commonly used type of printer, and range from small inexpensive consumer models to expensive professional machines.

The concept of inkjet printing originated in the 20th century, and the technology was first extensively developed in the early 1950s. Starting in the late 1970s, inkjet printers that could reproduce digital imagesgenerated by computers were developed.

Example:Epson, Hewlett-Packard (HP), and Canon. In the worldwide consumer market, four manufacturers account for the majority of inkjet printer sales: Canon, HP, Epson, and brother.

Head designs:

Fixed head:

The fixed-head philosophy provides an inbuilt print head (often referred to as a gaiter - head) that is designed to last for the life of the printer.

Disposal head:

The disposal head philosophy uses a print head, which is supplied as a part of a replaceable ink cartridge. Every time a cartridge is exhausted, the entire cartridge and print head are replaced with a new one.

Advantages:

Compared to earlier consumer-oriented colour printers, inkjet printers have a number of advantages. They are quieter in operation than impact dot matrix or daisywheel printers. They can print finer, smoother details through higher resolution. Consumer inkjet printers with photographic-quality printing are widely available.

Some types of industrial inkjet printers areHP, Epson, Canon, Konica Minolta, FujiFilm, EFi, Durst, Brother, Roland, Mimaki, Mutoh and many others worldwide.

Disadvantages:

Many "intelligent" ink cartridges contain a microchip that communicates the estimated ink level to the printer; this may cause the printer to display an error message, or incorrectly inform the user that the ink cartridge is empty.

Long-term durability of early inkjet prints was quite poor, though improved ink formulations have greatly improved this attribute. See the section on durability for more information.

Printing of functional materials:

- Inkjet printers and similar technologies are used in the production of many microscopic items. See Microelectromechanical systems.
- Inkjet printers are used to form conductive traces for circuits, and color filters in LCD and plasma displays.

Durability:

Inkjet documents can have poor to excellent archival durability, depending on the quality of the inks and paper used.

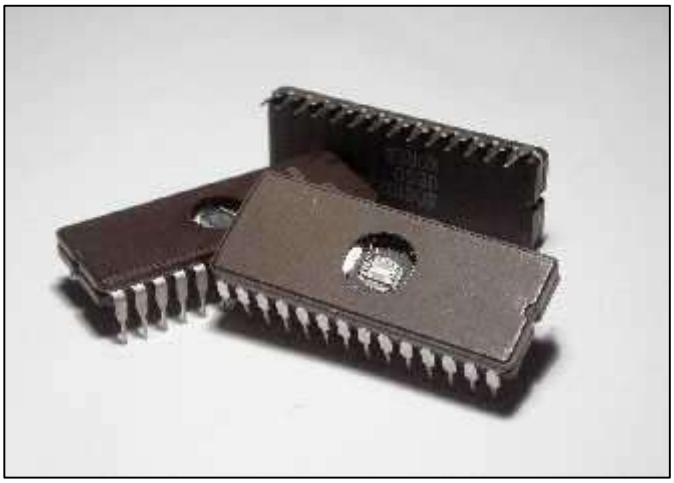
Conclusion:

Inkjet printers utilize a dot printing technique, using tiny dots between 50 and 60 microns in diameter to create any image or text on paper with ink. The simplicity of the inkjet printer makes it an affordable way to achieve a stunning result.

12. INTEGRATED CIRCUITS

An integrated circuit or monolithic integrated circuit (also referred to as an IC, a chip, or a microchip) is a set of electronic circuits on one small flat piece (or "chip") of semiconductor material, normally silicon. The integration of large numbers of tiny transistors into a small chip results in circuits that are orders of magnitude smaller, cheaper, and faster than those are constructed of discrete electronic components.

The IC's mass production capability, reliability and building block approach tocircuit design has ensured the rapid adoption of standardized ICs in place of designs using discrete transistors. ICs are now used in virtually all electronic equipment and have revolutionized the world of electronics.



Computers, mobile phones and other digital home appliances are inextricable parts of the structure of modern societies, made possible by the small size and low cost of ICs.ICs were made possible by experimental discoveries showing that semiconductor devices could perform the functions of vacuum tubes, and by mid-20th-century technology advancements in semiconductor device fabrication.

Since their origins in the 1960s, the size, speed, and capacity of chips have progressed enormously, driven by technical advances that fit more and more transistors on chips of the same size a modern chip may have several billion transistors in an area the size of a human fingernail. These advances, roughly following Moore’s law, make a computer chip possess millions of times the capacity and thousands of times the speed of the computer chips of the early 1970s.

Advantages:

Advances in IC technology, primarily smaller features and larger chips, have allowed the number of transistors in an integrated circuit to double every two years, a trend known as Moore's law. This increased capacity has been used to decrease cost and increase functionality. In general, as the feature size shrinks, almost every aspect of an IC's operation improves. The cost per transistor and the switching power consumption per transistor go down, while the memory capacity and speed go up, through the relationships defined by Dennard scaling. Because speed, capacity, and power consumption gains are apparent to the end user, there is fierce competition among the manufacturers to use finer geometries. Over the years, transistor sizes have decreased from 10s of microns in the early 1970s to 10 nanometers in 2017 with a corresponding million-fold increase in transistors per unit area. As of 2016, typical chip areas range from a few square millimeters to around 600 mm^2, with up to 25 million transistors per mm.

Name	Signification	Year	Transistors number	Logic gates number
SSI	*small-scale integration*	1964	1 to 10	1 to 12
MSI	*medium-scale integration*	1968	10 to 500	13 to 99
LSI	*large-scale integration*	1971	500 to 20,000	100 to 9,999
VLSI	*very large-scale integration*	1980	20,000 to 1,000,000	10,000 to 99,999
ULSI	*ultra-large-scale integration*	1984	1,000,000 and more	100,000 and more

Generations:

In the early days of simple integrated circuits, the technology's large scale limited each chip to only a few transistors, and the low degree of integration meant the design process was relatively simple. Manufacturing yields were also quite low by current standards. As the technology progressed, millions, then billions of transistors could be placed on one chip, and good designs required thorough planning, giving rise to the field of Electronic Design Automation, or EDA.

13. INTERNET CONTROL MESSAGE PROTOCOL (ICMP)

Introduction:

ICMP(Internet Control Message Protocol) is an error reporting protocol network devices like routers use to generate error messages to the source IP address when network problems prevent delivery of IP packets. ICMP creates and sends messages to the source IP address indicating that a gateway to the Internet that a route, service or host cannot be reached for packet delivery. Any IP network device has capability to send, receive, or process ICMP messages.

ICMP is not a transport protocol that sends data between systems. While ICMP is not used regularly in end-user applications, it is used by administrators to troubleshoot internet connections in diagnostic utilities including ping and trace route.

One of the main protocols of the Internet Protocol suite, ICMP is used by routers, intermediary devices or hosts to communicate error information or updates to other routers, intermediary devices or hosts.

Internet control message protocol:

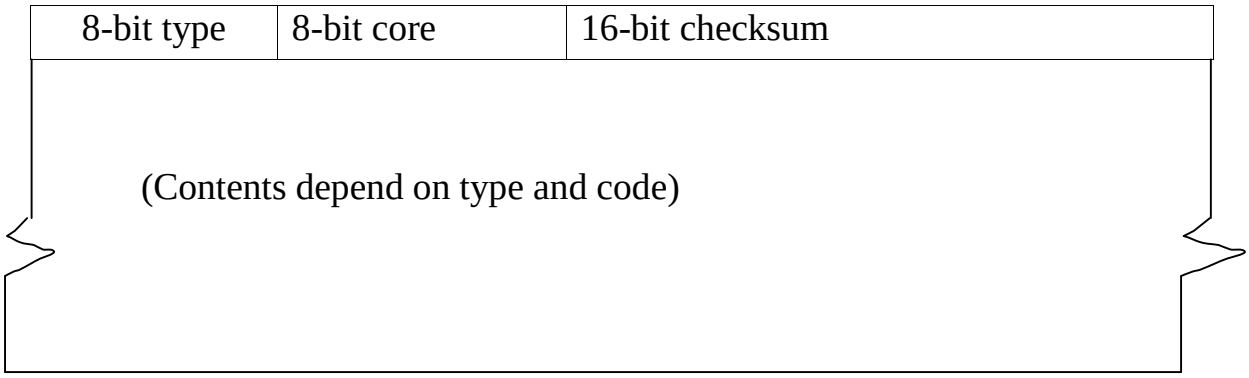
- This protocol is a classic example of client server application.
- The ICMP server executes on all IP end system computers and all IP intermediate systems.

Uses:

The protocol is used to report problems with delivery of IP datagram within an IP network.

It can be used to show when a particular End System (ES) is not responding, when an IP network is not reachable, when a node is overloaded, when an error occurs in the IP header information, etc.

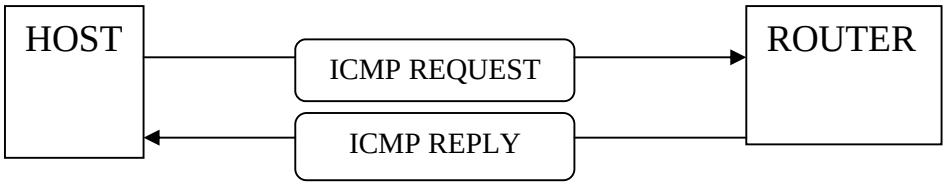
The protocol is also frequently used by Internet managers, to verify correct operations of End Systems (ES) and to check that routers are correctly routing packets to the specified destination address.



The 8-bit type code identifies the types of the message. This is followed by at least the first 28 byte of the packet that resulted in generation of the error message (i.e., the network –layer header and first 8 byte of the transport header). This payload is, for instance used by a sender that receives the ICMP message to perform Path MTU Discovery so that receives it may determine IP destination address of the packet that resulted in the error. Longer are also encouraged.

ICMP query message:

- Request sent by the host to a router or host.
- Reply sent back to querying host.



Network layer:

Every network has multiple layers that actually make up the entire network, from the computers and servers that operate on the network, to even the pieces you do not see like the Network layer, which helps ICMP functions. The network layer builds the backbone of the Internet and all networks that transfer any type of data requests. since the network layer plays an important part of the network , having the ICMP protocol run on this layer allows the protocols detect problems that arise and helps track down the source so that administrator can correct the issues.

14. INTERNET MESSAGE ACCESS PROTOCOL (IMAP)

History:

IMAP was designed by Mark Crispin in 1986 as a remote mailbox protocol, in contrast to the widely used POP, a protocol for retrieving the contents of a mailbox. IMAP was previously known as Internet Mail Access Protocol, Interactive Mail Access Protocol (RFC 1064), and Interim Mail Access Protocol.

Original IMAP:

The original Interim Mail Access Protocol was implemented as a Xerox Lisp machine client and a TOPS-20 server. No copies of the original interim protocol specification or its software exist. Some of its commands and responses were similar to IMAP2, the interim protocol lacked command/response tagging and thus its syntax was incompatible with all other versions of IMAP.

IMAP2:

The interim protocol was quickly replaced by the Interactive Mail Access Protocol (IMAP2), defined in RFC 1064 (in 1988) and later updated by RFC 1176 (in 1990). IMAP2 introduced the command/response tagging and was the first publicly distributed version.

IMAP3:

IMAP3 is an extremely rare variant of IMAP. It was published as RFC 1203 in 1991. It was written specifically as a counter proposal to RFC 1176, which itself proposed modifications to IMAP2. IMAP3 was never accepted by the marketplace. The IESG reclassified RFC1203 "Interactive Mail Access Protocol - Version 3" as a Historic protocol in 1993. The IMAP Working Group used RFC1176 (IMAP2) rather than RFC1203 (IMAP3) as its starting point.

IMAP2bis:

With the advent of MIME, IMAP2 was extended to support MIME body structures and add mailbox management functionality (create, delete, rename, message upload) that was absent from IMAP2. This experimental revision was called IMAP2bis; its specification was never published in non-draft form.

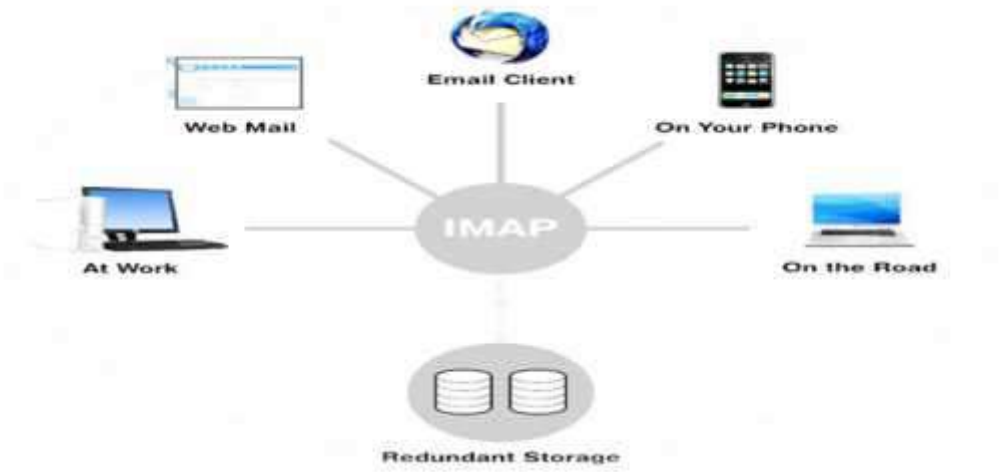
An internet draft, of IMAP2bis was published by the IETF IMAP Working Group in October 1993. This draft was based upon the following earlier specifications: unpublished IMAP2bis.TXT document, RFC1176, and RFC1064 (IMAP2). The IMAP2bis.TXT draft documented the state of extensions to IMAP2 as of December 1992. Early versions of Pine were widely distributed with IMAP2bis support (Pine 4.00 and later supports IMAP4rev1).

IMAP4:

An IMAP Working Group formed in the IETF in the early 1990s took over responsibility for the IMAP2bis design. The IMAP WG decided to rename IMAP2bis to IMAP4 to avoid confusion.

E-mail protocols:

The Internet Message Access Protocol is an Application Layer Internet protocol that allows an e-mail client to access e-mail on a remote mail server. The current version, IMAP version 4 revision 1 (IMAP4rev1), is defined by RFC 3501. An IMAP server typically listens on well-known port 143. IMAP over SSL (IMAPS) is assigned well-known port number 993.



Reference:

In computing, the Internet Message Access Protocol (IMAP) is an Internet standard protocol used by e-mail clients to retrieve e-mail messages from a mail server over a TCP/IP connection. IMAP is defined by RFC 3501.IMAP was designed with the goal of permitting complete management, of an email box by multiple email clients, therefore clients generally leave messages on the server until the user explicitly deletes them. An IMAP server typically listens on port number 143. IMAP over SSL (IMAPS) is assigned the port number 993.

15. iOS

iOS (formerly iPhone OS) is a mobile operating system created and developed by Apple Inc. exclusively for its hardware. It is the operating system that presently powers many of the company's mobile devices, including the iPhone, iPad, and iPod Touch. It is the second most popular mobile operating system globally after Android.

Originally unveiled in 2007 for the iPhone, iOS has been extended to support other Apple devices such as the iPod Touch (September 2007) and the iPad (January 2010). As of January 2017, Apple's App Store contains more than 2.2 million iOS applications, 1 million of which are native for iPads. These mobile apps have collectively been downloaded more than 130 billion times.

The iOS user interface is based upon direct manipulation, using multi-touch gestures. Interface control elements consist of sliders, switches, and buttons. Interaction with the OS includes gestures such as swipe, tap, pinch, and reverse pinch, all of which have specific definitions within the context of the iOS operating system and its multi-touch interface. Internal accelerometersare used by some applications to respond to shaking the device (one common result is the undo command) or rotating it in three dimensions (one common result is switching between portrait and landscape mode). Apple has been significantly praised for incorporating thorough accessibility functions into iOS, enabling users with vision and hearing disabilities to properly use its products.

History:

In 2005, when Steve Jobs began planning the iPhone, he had a choice to either "shrink the Mac, which would be an epic feat of engineering, or enlarge the iPod". Jobs favored the former approach but pitted the Macintosh and iPodteams, led by Scott Forstall and Tony Fadell, respectively, against each other in an internal competition, with Forstall winning by creating the iPhone OS. The decision enabled the success of the iPhone as a platform for third-party developers: using a well-known desktop operating system as its basis allowed the many third-party Mac developers to write software for the iPhone with minimal retraining. Forstall was also responsible for creating a software development kitfor programmers to build iPhone apps, as well as an App Store withiniTunes.

Software updates:

Apple provides major updates to the iOS operating system annually via iTunes and for iOS 5 and later, over the air. The latest version is iOS 11, released on September 19, 2017.

Home screen:

The home screen, rendered by SpringBoard, displaysapplicationicons and a dock at the bottom where users can pin their most frequently used apps. The home screen appears whenever the user unlocks the device or presses the physical "Home" button whilst in another app.BeforeiOS 4 on the iPhone 3GS (or later), the screen's background could be customized only through jailbreaking, but can now be changed out of the box. The screen has a status bar across the top to display data, such as time, battery level, and signal strength. The rest of the screen is devoted to the current application. When a passcode is set and a user switches on the device, the passcode must be entered at the Lock Screen before access to the Home screen is granted.

Accessibility:

iOS offers various accessibility features to help users with vision and hearing disabilities. One major feature,VoiceOver, provides a voice reading information on the screen, including contextual buttons, icons, links and other user interface elements, and allows the user to navigate the operating system through gestures. Any apps with default controls and developed with a UIKitframework gets VoiceOver functionality built-inOne example includes holding up the iPhone to take a photo, with VoiceOver describing the photo scenery, As part of a "Made for iPhone" program, introduced with the release of iOS 7 in 2013, Apple has developed technology to use Bluetooth and a special technology protocol to let compatible third-party equipment connect with iPhones and iPads for streaming audio directly to a user's ears. Additional customization available for made for iPhone products include battery tracking and adjustable sound settings for different environment. Apple made further efforts for accessibility for the release of iOS 10 in 2016, adding a new pronunciation editor to VoiceOver, adding a Magnifier setting to enlarge objects through the device's camera, software TTYsupport for deaf.

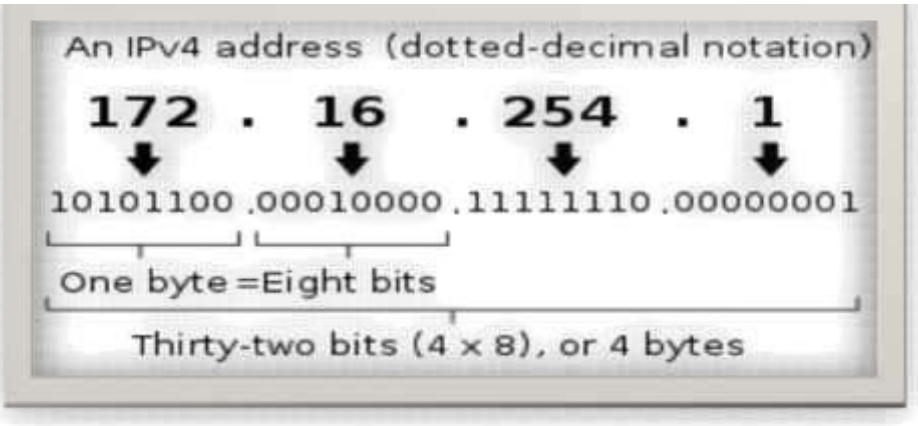
16. IPv4 AND IPv6

IPv4:

Internet Protocol (IPv6) version fourth is a connectionless protocol for use on packet switched networks. It operates on a best effort model, in that it does not guarantee delivery, nor does it assure proper sequencing or avoidance of duplicate delivery. These aspects, including data integrity, are addressed by an upper layer transport protocol, such as the Transmission Control Protocol (TCP).

Address representations:

IPv4 addresses may be represented in any notation expressing a 32-bit integer value. They are most often written in dot-decimal system, which consists of four octets of the address expressed individually in decimal numbers and separated by period (.). The CIDR notation standard combines the address with its routing prefix in a compact format, in which a slash character (/) and the count of consecutive 1 bit in the routing prefix (subnet mask) follow the address.

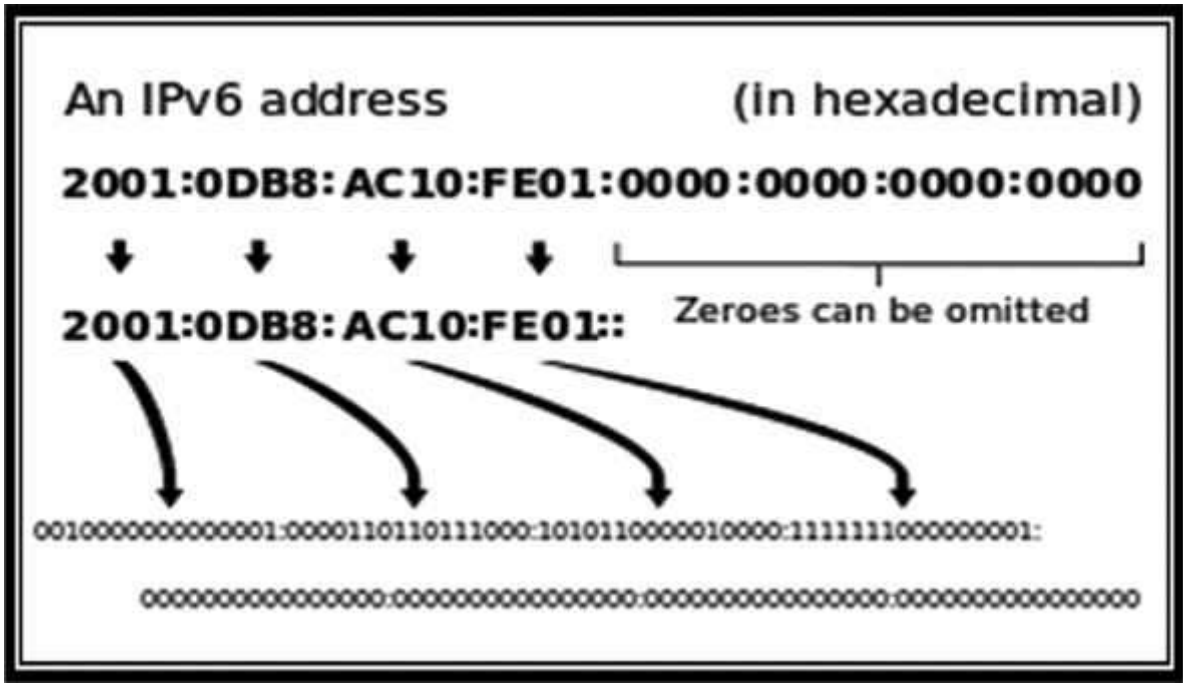


IPv6:

Internet Protocol version sixth (IPv6) is the most recent version of the Internet Protocol (IP), the communications protocol that provides an identification and location system for computers on networks and routes traffic across the internet. IPv6 was developed by the Internet Engineering Task Force(IETF) to deal with the long-anticipated problem of IPv4 Address ExhaustionIPv6 is intended to replace IPv4. By 1998, the Internet Engineering Task Force (IETF) had formalized the successor protocol.

Address representations of IPv6:

IPv6 uses a 128-bit address, theoretically allowing 2^{128}, or approximately 3.4×10^{38} addresses. The actual number is slightly smaller, as multiple ranges are reserved for special use or completely excluded from use.



The total number of possible IPv6 addresses is more than 7.9×10^{28} times as many as IPv4, IPv6 provides other technical benefits in addition to a larger addressing space. In particular, it permits hierarchical address allocation methods that facilitate route aggregation across the Internet, and thus limit the expansion of routing tables IPv6 addresses are represented as eight groups of four hexadecimal digits with the groups being separated by colons.

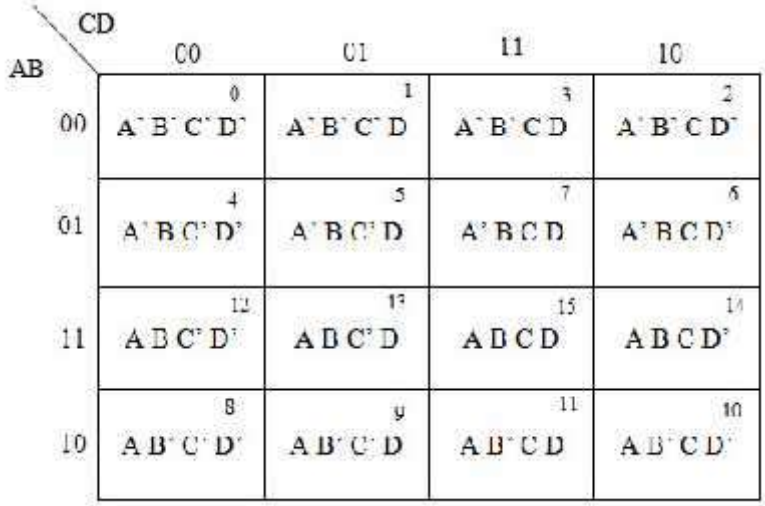
Benefits of IPv6 over IPv4:

- More efficient routing.
- More efficient packet processing.
- Directed data flows.
- Simplified network configuration.
- Support for new services.
- Security.

17. KARNAUGH MAPS

Introduction:

The Karnaugh map (KM or K-map) is a method of simplifying Boolean algebra expressions. Maurice Karnaugh introduced it in 1953 as a refinement of Edward Veitch's 1952 Veitch chart, which actually was a rediscovery of Allan Marquand's 1881 logical diagram. But with a focus now set on its utility for switching circuits



The Karnaugh map reduces the need for extensive calculations by taking advantage of humans' pattern-recognition capability. It also permits the rapid identification and elimination of potential race conditions. The required Boolean results are transferred from a truth table onto a two-dimensional grid where, in Karnaughmaps, the cells are ordered in Gray code, and each cell position represents one combination of input conditions, while each cell value represents the corresponding output value. Optimal groups of 1s or 0s are identified, which represent the terms of a canonical form of the logic in the original truth table. These terms can be used to write a minimal Boolean expression representing the required logic. Karnaugh maps are used to simplify real-world logic requirements so that they can be implemented using a minimum number of physical logic gates. A sum-of-products expression can always be implemented using AND gates feeding into an OR gate, and a product-of-sums expression leads to OR gates feeding an AND gate. Karnaugh maps can also be used to simplify logic expressions in software design. After the Karnaugh map has been constructed, it is used to find one of the simplest possible forms a canonical form for the information in the truth table. Adjacent 1s in the Karnaugh map represent opportunities to simplify the expression. The Minterms ('minimal terms') for the final expression are found by encircling groups of 1s in the map.

Minterm groups must be rectangular and must have an area that is a power of two (i.e., 1, 2, 4, 8…). Minterm rectangles should be as large as possible without containing any 0s. Groups may overlap in order to make each one larger. Karnaugh maps also allow easy minimizations of functions whose truth tables include "don't care" conditions. A "don't care" condition is a combination of inputs for which the designer doesn't care what the output is. Therefore, "don't care" conditions can either be included in or excluded from any rectangular group, whichever makes it larger. They are usually indicated on the map with a dash or X. Karnaugh maps are useful for detecting and eliminating race conditions. Race hazards are very easy to spot using a Karnaugh map, because a race condition may exist when moving between any pair of adjacent, but disjoint, regions circumscribed on the map

Steps to solve expression using K-map:

- Select K-map according to the number of variables.
- Identify minterms or maxterms as given in problem.
- For SOP put 1's in blocks of K-map respective to the minterms (0's elsewhere).
- For POS put 0's in blocks of K-map respective to the maxterms(1's elsewhere).
- Make rectangular groups containing total terms in power of two like 2,4,8 ..(except 1) and try to cover as many elements as you can in one group.
- From the groups made in step 5 find the product terms and sum them up for SOP form.

Rules of simplification for K-map:

- No zeros allowed.
- No diagonals.
- Only power of 2 number of cells in each group.
- Groups should be as large as possible.
- Every one must be in at least one group.
- Overlapping allowed.
- Wrap around allowed.
- Fewest numbers of groups possible.

18. KVM SWITCH

Introduction:

KVM being an abbreviation for "keyboard, video and mouse". A hardware device that allows a user to control multiple computers from one or more sets of keyboards, video monitors, and mice. KVM switches are often found in data centres where multiple servers are placed in a single rack. By pressing a button on the KVM switch, the administrator can change control from one server to the next. RemigiusShatas, the founder of Cybex expanded the initialism to Keyboard, Video and Mouse (KVM) in 1995.

Types of KVM switch:

- USB Hub Based KVM
- Emulated USB KVM
- Semi-DDM USB KVM
- DDM USB KVM

USB Hub Based KVM:

Also called an Enumerated KVM switch, a connected/shared USB device must go through the full initiation process (USB enumeration) every time the KVM is switched to another target system/port. The switching to different ports is just as if you were to physically plug and unplug a USB device into your targeted system.

Emulated USB KVM:

Dedicated USB console port(s) are assigned to emulate special sets of USB keyboard or mouse switching control information to each connected/targeted system.

Emulated USB provides an instantaneous and reliable switching action that makes keyboard hotkeys and mouse switching possible.However, this class of KVM switch only uses generic emulations and consequently has only been able to support the most basic keyboard and mouse features.

Semi-DDM USB KVM:

Dedicated USB console port(s) work with all USB-HID but do not maintain the connected devices' presence to all of the targeted systems simultaneously. This class of KVM takes advantage of DDM (Dynamic Device Mapping) technology.

DDM USB KVM:

Dedicated USB console port work with all USB-HID (including keyboard and mouse) and maintain the connected devices special functions and characteristics to each connected/targeted system. This class of KVM switch overcomes the frustrating limitations of an Emulated USB Class KVM by emulating the true characters of the connected devices to all the computers simultaneously. This means that you can now use the extra function keys, wheels, buttons, and controls that are commonly found on modern keyboards and mice.

Active and passive switch:

KVM switches were originally passive, mechanical devices based on multi-pole switches and some of the cheapest devices on the market still use this technology. Mechanical switches usually have a rotary knob to select between computers. KVMs typically allow sharing of two or four computers, with a practical limit of about twelve machines imposed by limitations on available switch configurations.

One limitation of mechanical KVM switches is that any computer not currently selected by the KVM switch does not 'see' a keyboard or mouse connected to it. In normal operation, this is not a problem, but while the machine is booting up it will attempt to detect its keyboard and mouse and either fail to boot or boot with an unwanted configuration. Likewise, a failure to detect the monitor may result in the computer falling back to 640x480 resolution. Thus, mechanical KVM switches may be unsuitable for controlling machines which can reboot automatically (e.g. after a power failure).

19. LASER PRINTER

History of Laser Printer:

Laser printer is an electrostatic digital printer. It produces high-quality text and graphics (and moderate-quality photographs) by repeatedly passing a laser beam back and forth over a negatively charged cylinder called a "drum" to define a differentially charged image. The drum then selectively collects electrically charged powdered ink (toner), and transfers the image to paper.

In 1969, Gary Starkweather, who worked in Xerox's product development department, had the idea of using a laser beam to "draw" an image. In 1972, Starkweather worked with Butler Lampson and Ronald Rider to add a control system and character generator, resulting in a printer called EARS (Ethernet, Alto Research character generator, Scanned laser output terminal) which later became the Xerox 9700, the laser printer.

The first commercial implementation of a laser printer was the IBM 3800 in 1976. It was designed for data canters, where it replaced line printers attached to mainframe computers.

The IBM 3800 was used for high-volume printing on continuous stationery, and achieved speeds of 215 pages per minute (ppm), at a resolution of 240 dots per inch (dpi). The laser printer was brought to market in 1977.The first laser printer designed for office use reached market in 1981: the Xerox star 8010. The system used a desktop metaphor that was unsurpassed in commercial sales. The first laser printer intended for mass-market sales was the HP laser jet, released in 1984; it used the Canon CX engine, controlled by HP software.

Advantages and disadvantages of laser printer:

The potential of digital presentation is being continually enhanced, this is quite apparent as one of the main hassles with computers today is to continually upgrade hardware to meet with higher potential output. They are hands down, the best type of printer in terms of potential and speed of output, but they do have a downside as well, some of the advantages and disadvantages of laser printer are:

Advantages:

- The main benefit behind these printers is probably its efficiency and speed at printing. Laser printers are also known as 'page printers' as they print documents a page at a time, and performs it at a very fast rate.
- They furnish highest potential production in comparison with the other types of printers. This is generally due to the technology behind it as laser printers utilize electro-photography for printing which results in potential output.
- While it is a small issue, noise can be very unproductive and disturbing especially at a work place; laser printers are highly optimized and barely emits any sound.
- They also offer user-friendliness with other features like self-printing, where printing maybe done without supervision thus addition productivity at the workplace.

Disadvantages:

- Laser printers are considerable and utilize complicated technology and perform fast output, the result of which is a relatively large hardware gadget which can take up a lot of space.
- As they are non-impact printers, multipart stationary cannot be used thus double printing cannot be simultaneously performed.
- Laser printers are also known to be dangerous to the atmosphere and your health. Due to the high voltages when running the machine, small amounts of ozone are generated which can damage the ozone layer.
- Some laser printers are also known to emit particles that are suspected to cause respiratory diseases.

20. LINKEDIN

Introduction:

LinkedIn is a social professional networking site designed specifically for the business community. LinkedIn Founded on December 28, 2002 by Reid Hoffman and launched on May 5, 2003.The goal of the site is to allow registered members to establish and document networks of people they know and trust professionally.

How to create LinkedIn profile?

A LinkedIn member's profile page, which emphasizes skills, employment history and education, has professional network news feeds and a limited number of customizable modules. Basic membership for LinkedIn is free. Network members are called "connections." Unlike other free social networking sites like Facebook or Twitter, LinkedIn requires connections to have a pre-existing relationship.

LinkedIn functions:

With basic membership, a member can only establish connections with someone has worked with, knows professionally (online or offline) or has gone to school with. Connections up to three degrees away (see six degrees of separation) are seen as part of the member's network, but the member is not allowed to contact them through LinkedIn without an introduction. Premium subscriptions can be purchased to provide members with better access to contacts in the LinkedIn database.

LinkedIn by Microsoft:

Microsoft acquired LinkedIn in June of 2016 for $26.2 billion. According to some experts, the rich troves of semi-structured data that LinkedIn's members freely give away job titles, geographies, industry information, skill sets made the deal a steal, even though the LinkedIn acquisition was Microsoft's more expensive purchase to date. LinkedIn has been gathering up data across the more than 225 million LinkedIn profiles in an Economic Graph to provide policymakers, employers, workers and educators with data-driven insight into patterns that will help align workforce supply with demand. Such patterns include when people generally look for the next step in their career, work migration trends in specific geographical locations, skill gaps in specific industries and what cities are "stickiest," i.e. areas that employees are less likely to move away from.

New interface in 2017:

Soon after LinkedIn’s acquisition by Microsoft, on January 19, 2017, LinkedIn’s new desktop version was introduced. The new version was meant to make the user experience seamless across mobile and desktop. Some of the changes were made according to the feedback received from the previously launched mobile app. Features that were not heavily used were removed. For example, the contact tagging and filtering features are not supported any more. Following the launch of the new interface, some users, including blogger Zubair Abbas, complained about missing features, which were there in the older version, slowness and bugs in the UI. The issues were faced by both free and premium users, and with both the desktop version and the mobile version of the site.

21. LINUX KERNEL

About Linux kernel:

The Linux kernel is an open source monolithic Unix-like computer operating system kernel.

The Linux family of operating systems is based on this kernel and deployed on both traditional computer systems such as personal computers and servers, usually in the form of Linux distributions, and on various embedded devices such as routers, wireless access points, PBXes, set-top boxes, FTA receivers, smart TVs, PVRs, and NAS appliances.

The Android operating system for tablet Computers, Smartphone's, and Smartwatches uses services provided by the Linux kernel to implement its functionality. As of November 2017, all of the world's 500 most powerful supercomputers run Linux.

API in Linux kernel:

The Linux kernel API, the Application Programming Interface (API) through which user programs interact with the kernel, is meant to be very stable and to not break user space programs (some programs, such as those with GUIs, rely on other APIs as well).

However, the interface between the kernel and loadable kernel modules (LKMs), unlike in many other kernels and operating systems, is not meant to be very stable by design.

The Linux kernel, developed by contributors worldwide, is a prominent example of free and open source software, and its supported up to six years depending on version.

Day-to-day development discussions take place on the Linux kernel mailing list (LKML).

The Linux kernel is released under the GNU General Public License version 2(GPLv2), with some firmware images released under various non-free licenses.

History of Linux kernel:

The history of Linux began in 1991 with the commencement of a personal project by Finnish student Linux Torvalds to create a new free operating system kernel.

Since then, the resulting Linux kernel has been marked by constant growth throughout its history.

In 1991, while studying computer science at university of Helsinki, Linus Torvalds began a project that later became the Linux kernel.

As Torvalds wrote in his book Just for Fun, he eventually ended up writing an operating system kernel. On 25 August 1991, he (at age 21) announced this system in a Usenet posting to the newsgroup “come.Os.minix”.

Different types of versions in Linux kernel:

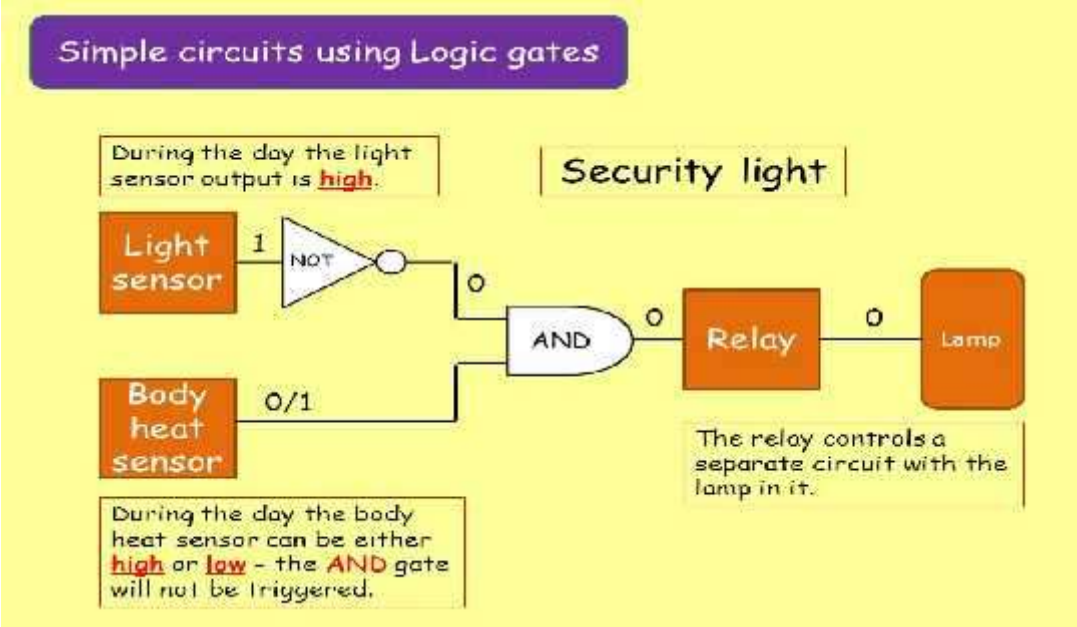
- ✓ 2.5.X versions
- ✓ 2.6.X versions
- ✓ 3.X versions
- ✓ 4.X versions

This version numbers are include many different types of version.X indicates that versions number because there is a lot of a Linux kernel version in this whole version number.

22. LOGIC GATES

Gates are also called as logic circuit as they can be analyzed using Boolean algebra. A gate is actually a circuit with one or more than one input signal but having only one output signal. The most commonly used logic gates are AND,OR, NOT, NAND, NORand EXOR.

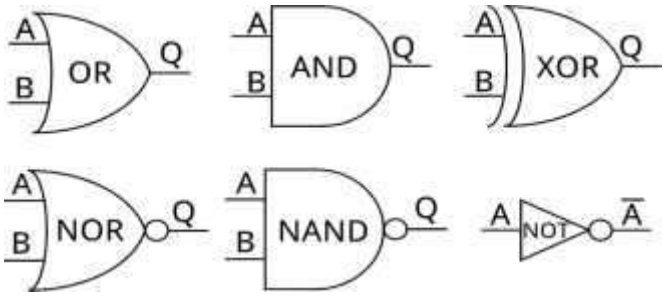
Simple circuit using logic gates:



NAND and NOR gates are called as the universal gates. Logic gates have two or more input but have only one output expect the not gate which has only one input.

The basic gates:

- AND
- OR
- NOT



AND gate:

The AND gate performs logical multiplication operation known as and function. The AND gate has two or more input and give a single output. The output of AND gate is high only when all the inputs are high. Even if any of the input is low, the output will be low. If A and B are the input variables of and gate and Y is its output, then Y=A.B.

OR gate:

The operation of the OR gate is such that a high on the output is produced when any of the input is high (1). The output is low only when all inputs are low(0).If A and B are the input variables of an OR gate and Y is an output variables, then Y=A+B.

NOT gate:

The NOT gate performs the basic logical function called inversion or complementation. The purpose of this gate is convert one level into the opposite logic level.

NAND gate:

NAND gate is a contraction of the NOT-AND gates. It has two or more inputs and only one output. When all the inputs are high the output is low. If any one or both the inputs are low then then the output is high.

NOR gate:

NOR gate is a contraction of NOT-OR gates. It has two or more inputs and only one output. The output is high only when all the inputs are low. If any of the one or both inputs are high then the output is low.

EXOR gate:

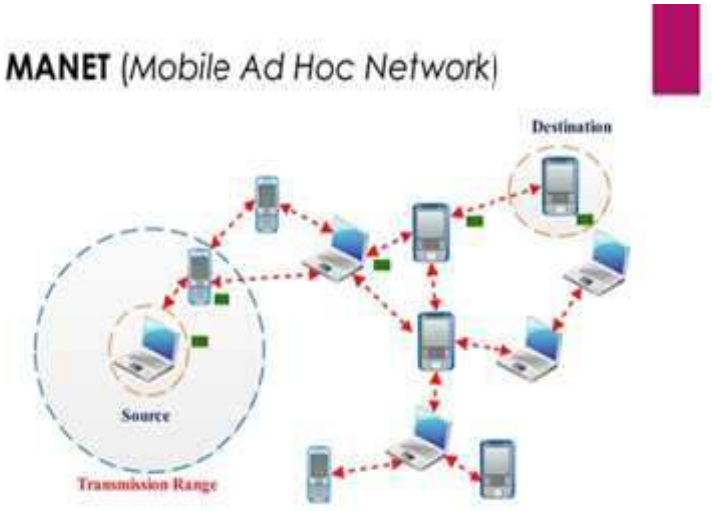
The EXOR gate is a digital logic gate that gives a true (1 or HIGH) output when the number of true inputs is odd. An EXOR gate implements an exclusive or; that is, a true output results if one, and only one, of the inputs to the gate is true.

23. MANET

A mobile ad hoc network (MANET), also known as wireless ad hoc network or ad hoc wireless Network, is a continuously self-configuring, infrastructure-less network of mobile devices connected wirelessly.

Each device in a MANET is free to move independently in any direction, and will therefore change its links to other devices frequently. Each must forward traffic unrelated to its own use, and therefore be a router. The primary challenge in building a MANET is equipping each device to continuously maintain the information required to properly route traffic. Such networks may operate by themselves or may be connected to the larger Internet. They may contain one or multiple and different transceivers between nodes. This results in a highly dynamic, autonomous topology.

MANETs are a kind of wireless ad hoc network (WANET) that usually has a routable networking environment on top of a Link Layer ad hoc network. MANETs consist of a peer-to-peer, self-forming, self-healing network. MANETs circa 2000–2015 typically communicate at radio frequencies (30 MHz – 5 GHz).



Types:

- Vehicular ad hoc networks(VANETs)
- Smart phone ad hoc networks (SPANs)
- Internet-based mobile ad-hoc networks (I-MANETs)
- Flying ad hoc networks (FANETs)

Advantages of MANET:

- **Router Free:**
  Connection to the internet without any wireless router is the main advantage of using a mobile ad hoc network.

- **Fault Tolerance:**
  MANET supports connection failures, because routing and transmission protocols are designed to manage these situations.

- **Cost:**
  MANET could be more economical in some cases as they eliminate fixed infrastructure costs and reduce power consumptions at mobile nodes.

Disadvantages of MANET:

- **Energy consumption:**
  Energy management is process of managing the sources and consumers of energy in node or in the network as a whole for enhancing the lifetime of the network.

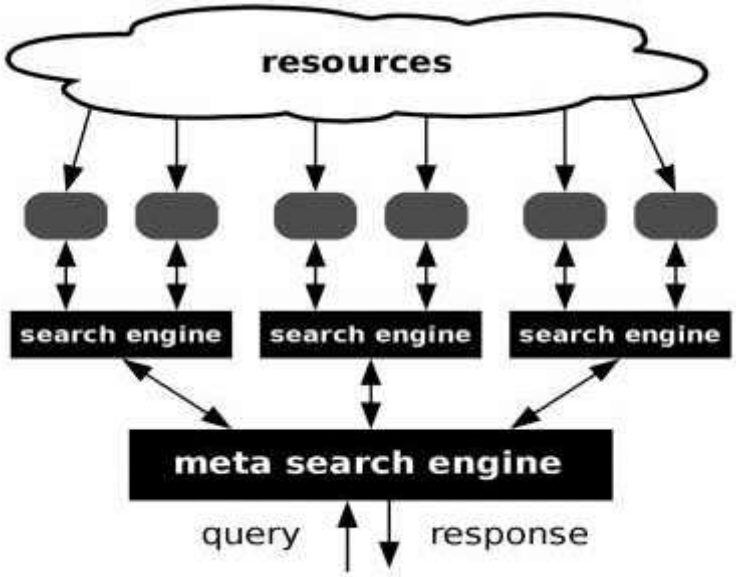
- **Security in MANET:**
  Security in Mobile Ad hoc Network is very important especially in military applications. Lack of central coordination and shared wireless medium makes them more vulnerable to attacks than wired network.

- **Deployment consideration:**
  During deployment of Ad hoc wireless network involves actions different from the wired network. It needs good amount of planning and estimation of future traffic growth.

24. META SEARCH ENGINES

A Meta search engine (or aggregator) is a search tool that uses another search engine's data to produce its own results from the Internet. Meta search engines take input from a user and simultaneously send out queries to third party search engines for results. Sufficient data is gathered, formatted by their ranks and presented to the users. Meta search engines do not have a repository or index of their own. They take advantage of indices created by other search engines. A typical Meta search engine pulls off the results from a number of search engines, say Google and Bing, and then apply their own algorithms in some cases to re-order the results.

Architecture of Meta search engine:

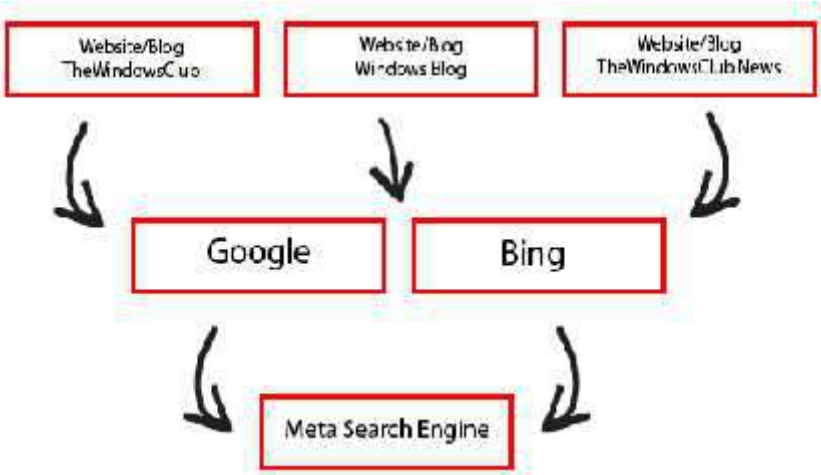


Advantages:

By sending multiple queries to several other search engines this extends the search coverage of the topic and allows more information to be found. They use the indexes built by other search engines, aggregating and often post-processing results in unique ways. A Meta search engine has an advantage over a single search engine because more results can be retrieved with the same amount of exertion.

Disadvantages:

Meta search engines are not capable of decoding query forms or able to fully translate query syntax. The number of links generated by Meta search engines are limited, and therefore do not provide the user with the complete results of a query.



Best Meta search engines:

1] Mamma: This is a great website to get the web, news, image and video search result. It grabs information from various search engine and provide it to the users.

2] iBoogie: This is a better meta search engine than Mamma, as it uses various filters to show specific information. The best part is we can get plenty of related search terms to find something faster.

3] Vroosh: This is another Meta search engine that can be used by anyone. Although we cannot find web or image search, we will get country-based search.

4] Turbo scout: Turbo Scout is probably the biggest Meta search engine since it grabs information from other Meta search engine like iThaki , Mamma, etc.

5] Search: Search.com is popular because of simplicity and a great number of features. It shows search result just like Google.

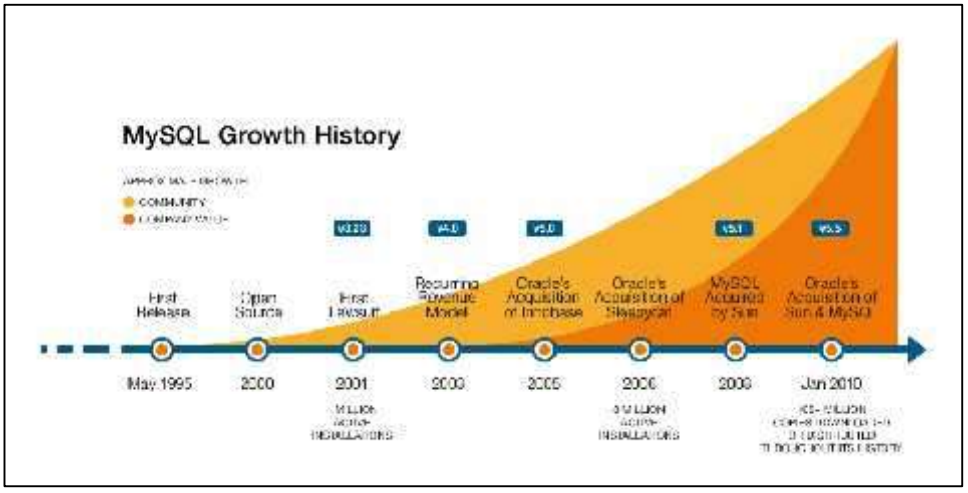
6] Unabot: Unabot is a consolidation of all Meta search engines. We will get a huge number of Meta search engines on the list, which can be used anytime.

25. MYSQL

MySQL is an open source relational database management system (RDBMS) based on Structured Query Language (SQL). MySQL runs on virtually all platforms, including Linux, UNIX, and Windows. MySQL is most often associated with web-based applications and online publishing and is an important component of an open source enterprise stack called LAMP.

MySQL supported storage engine:

1. **InnoDB**:InnoDB is a transaction-safe (ACID compliant) storage engine for MySQL that has commit, rollback, and crash-recovery capabilities to protect user data.
2. **MyISAM**: These tables have a small footprint. Table-level locking limits the performance in read/write workloads, so it is often used in read-only or read-mostly workloads in Web and data warehousing configurations.
3. **Memory**: Stores all data in RAM, for fast access in environments that require quick lookups of non-critical data. This engine was formerly known as the HEAP engine.
4. **CSV**: Its tables are really text files with comma-separated values. CSV tables let us import or dump data in CSV format, to exchange data with scripts and applications that read and write that same format
5. **Archive**: These compact, unindexed tables are intended for storing and retrieving large amounts of seldom-referenced historical, archived, or security audit information.
6. **Blackhole**: The Blackhole storage engine accepts but does not store data, similar to the Unix /dev/null device.

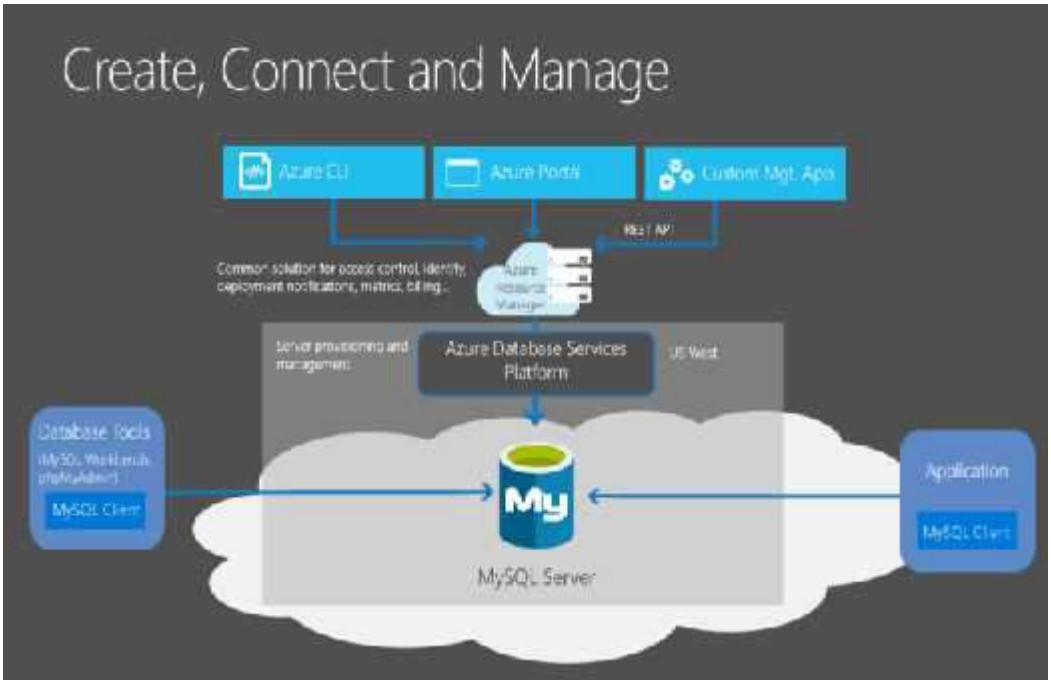


MySQL data types

- Numeric
- Date and Time
- String Types.

Advantages:

- MySQL is very easy to install an also an easy database to work with.
- Support Is Readily Available Whenever Necessary.
- It is an open-source database option, as the code is still available for free online.
- It is Incredibly Inexpensive.



Disadvantages:

- Development is not community driven and hence has lagged.
- Developers may find some of its limitations to be frustrating.
- It suffers from relatively poor performance scaling.
- Its functionality tends to be heavily dependent on Add-ons.

26. ON-LINE ANALYTICAL PROCESSING (OLAP)

Introduction:

Online analytical processing is an approach to answering multi-dimensional analytical (MDA) queries swiftly in computing. OLAP is part of the broader category of business intelligence, which also encompasses relational database, report writing and data mining. Typical applications of OLAP include business reporting for sales, marketing, management reporting, business process management (BPM), budgeting and forecasting, financial reporting and similar areas, with new applications coming up, such as agriculture. The term OLAP was created as a slight modification of the traditional database term online transaction processing (OLTP).

OLAP tools enable users to analyze multidimensional data interactively from multiple perspectives. OLAP consists of three basic analytical operations: consolidation (roll-up), drill-down, and slicing and dicing. Consolidation involves the aggregation of data that can be accumulated and computed in one or more dimensions. For example, all sales offices are rolled up to the sales department or sales division to anticipate sales trends. By contrast, the drill-down is a technique that allows users to navigate through the details. For instance, users can view the sales by individual products that make up a region's sales. Slicing and dicing is a feature whereby users can take out (slicing) a specific set of data of the OLAP cube and view (dicing) the slices from different viewpoints. These viewpoints are sometimes called dimensions (such as looking at the same sales by salesperson or by date or by customer or by product or by region, etc.)

Databases configured for OLAP use a multidimensional data model, allowing for complex analytical and ad hoc queries with a rapid execution time. They borrow aspects of navigational databases, hierarchical databases and relational databases.

OLAP is typically contrasted to OLTP (online transaction processing), which is generally characterized by much less complex queries, in a larger volume, to process transactions rather than for the purpose of business intelligence or reporting. Whereas OLAP systems are mostly optimized for read, OLTP has to process all kinds of queries (read, insert, update and delete).

Overview of OLAP systems:

At the core of any OLAP system is an OLAP cube (also called a 'multidimensional cube' or a hypercube). It consists of numeric facts called measures that are categorized by dimensions. The measures are placed at the intersections of the hypercube, which is spanned by the dimensions as a vector space. The usual interface to manipulate an OLAP cube is a matrix interface, like Pivot tables in a spreadsheet program, which performs projection operations along the dimensions, such as aggregation or averaging.

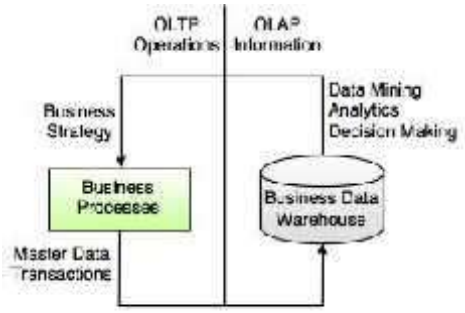


Fig. OLTP and OLAP

The cube metadata is typically created from a star schema or snowflake schema or fact constellation of tables in a relational database. Measures are derived from the records in the fact table and dimensions are derived from the dimension tables. Each measure can be thought of as having a set of labels, or meta-data associated with it. A dimension is what describes these labels; it provides information about the measure.

A simple example would be a cube that contains a store's sales as a measure, and Date/Time as a dimension. Each Sale has a Date/Time label that describes more about that sale.

Multidimensional databases:

Multidimensional structure is defined as "a variation of the relational model that uses multidimensional structures to organize data and express the relationships between data". The structure is broken into cubes and the cubes are able to store and access data within the confines of each cube. "Each cell within a multidimensional structure contains aggregated data related to elements along each of its dimensions". Even when data is manipulated it remains easy to access and continues to constitute a compact database format. The data still remains interrelated. Multidimensional structure is quite popular for analytical databases that use online analytical processing (OLAP) application.

27. OPEN FIRMWARE

Open Firmware, or OpenBoot in Sun Microsystems parlance, is a standard defining the interfaces of a computer firmware system, formerly endorsed by the Institute of Electrical and Electronics Engineers (IEEE). It originated at Sun, and has been used by Sun, Apple, IBM, ARMand most other non-x86 PCI chipset vendors. Open Firmware allows the system to load platform-independent drivers directly from the PCI card, improving compatibility.

Advantages:

Open Firmware Forth Code may be compiled into FCode, a byte code which is independent of computer architecture details such as the instruction set and memory hierarchy. A PCI card may include a program, compiled to FCode, which runs on any Open Firmware system. In this way, it can provide platform-independent boot-time diagnostics, configuration code, and device drivers. FCode is also very compact, so that a disk driver may require only one or two kilobytes. Therefore, many of the same I/O cards can be used on Sun systems and Macintoshes that used Open Firmware. FCode implements ANS Forth and a subset of the Open Firmware library.

Open Firmware furthermore defines a standard way to describe the hardware of a system. This helps the operating system to better understand its host computer, relying less on user configuration and hardware polling. Being based upon an interactive programming language, Open Firmware can be used to efficiently test and bring up new hardware. It allows drivers to be written and tested interactively. Operational video and mouse drivers are the only prerequisite for a graphical interface suitable for end-user diagnostics. Indeed, Apple shipped such a diagnostic "operating system" in many Power Macintoshes.

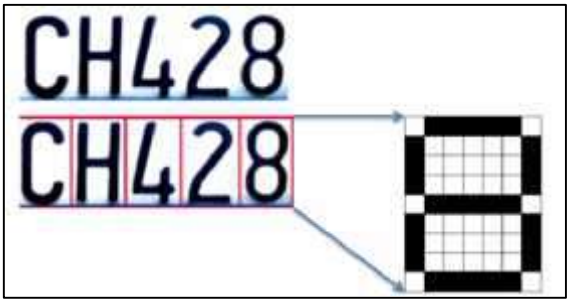
Access:

On Sun SPARC systems, the Open Firmware interface is displayed on the console terminal before the bootstrapping of the system software. If a keyboard is connected, the main video display will be used as the console terminal and Open Firmware can be re-entered at any time by pressing Stop-A (L1-A) on the keyboard. If no keyboard is connected, then the first serial line on the system is usually used as the console and Open Firmware is re-entered by sending a "Break" on the serial line. While the system software is running, various Open Firmware settings can be read or written using the eeprom command.

On a PowerPC-based Macintosh, the Open Firmware interface can be accessed by pressing the keys cmd + option + o + p at startup win + alt + o + p if using standard PC USB keyboard). Intel-based Macintoshes do not use Open Firmware; they use Extensible Firmware Interface, following Apple's transition to Intel processors. Also, early versions (before the PowerBook 3400) connect Open Firmware's input and output to the Modem port by default. This functionality is generally only used by developers or troubleshooting I.T. personnel; for common users, the Mac OS X operating system provides a high level graphical user interface to change commonly used Open Firmware settings. For instance, it is possible to specify the boot disk or partition without directly using the Open Firmware interface, but with some limitations (e.g. it is not possible to select boot from USB mass-storage devices, but Open Firmware allows iMac to boot using boot ud:,\\:tbxi command). Other Open Firmware settings can be changed using the nvram command while the system software is running.

28. OPTICAL CHARACTER RECOGNITION (OCR)

Optical character recognition (also optical character reader, OCR) is the mechanical or electronic conversion of images of typed, handwritten or printed text into machine-encoded text, whether from a scanned document, a photo of a document, a scene-photo (for example the text on signs and billboards in a landscape photo) or from subtitle text superimposed on an image (for example from a television broadcast). It is widely used as a form of information entry from printed-paper data records, whether passport documents, invoices, bank statements, computerised receipts, business cards, mail, printouts of static-data, or any suitable documentation. It is a common method of digitising printed texts so that they can be electronically edited, searched, stored more compactly, displayed on-line, and used in machine processes such as cognitive computing, machine translation, (extracted) text-to-speech, key data and text mining. OCR is a field of research in pattern recognition, artificial intelligence and computer vision.



History:

Early optical character recognition may be traced to technologies involving telegraphy and creating reading devices for the blind. In 1914, Emanuel Goldbergdeveloped a machine that read characters and converted them into standard telegraph code. Concurrently, Edmund Fournier D'Albe developed the optophone, a handheld scanner that when moved across a printed page, produced tones that corresponded to specific letters or characters.

In the late 1920s and into the 1930s Emanuel Goldberg developed what he called a "Statistical Machine" for searching microfilm archives using an optical code recognition system. In 1931 he was granted USA Patent number 1,838,389 for the invention. The patent was acquired by IBM.

Character recognition:

Matrix matching involves comparing an image to a stored glyph on a pixel-by-pixel basis; it is also known as "pattern matching", "pattern recognition", or "image correlation".

This relies on the input glyph being correctly isolated from the rest of the image, and on the stored glyph being in a similar font and at the same scale. This technique works best with typewritten text and does not work well when new fonts are encountered.

Feature extraction decomposes glyphs into "features" like lines, closed loops, line direction, and line intersections. The extraction features reduces the dimensionality of the representation and makes the recognition process computationally efficient. These features are compared with an abstract vector-like representation of a character, which might reduce to one or more glyph prototypes. General techniques of feature detection in computer vision are applicable to this type of OCR, which is commonly seen in "intelligent" handwriting recognition and indeed most modern OCR software. Nearest neighbour classifiers such as the k-nearest neighbours algorithm are used to compare image features with stored glyph features and choose the nearest match. Software such as Cuneiform and Tesseract use a two-pass approach to character recognition. The second pass is known as "adaptive recognition" and uses the letter shapes recognised with high confidence on the first pass to recognise better the remaining letters on the second pass. This is advantageous for unusual fonts or low-quality scans where the font is distorted.For a list of optical character recognition software see Comparison of optical character recognition software.

29. OPTICAL MARK RECOGNITION (OMR)

Optical mark recognition (also called optical mark reading and OMR) is the process of capturing human-marked data from document forms such as surveys and tests.They are used to read questionnaires, multiple-choice examination paper in the form of lines or shaded areas.

OMR background:

OMR is generally distinguished from optical character recognition (OCR) by the fact that a complicated pattern recognition engine is not required. That is, the marks are constructed in such a way that there is little chance of not reading the marks correctly. This does require the image to have high contrast and an easily recognizable or irrelevant shape. A related field to OMR and OCR is the recognition of barcodes such as the UPC bar code found on product packaging.

OMR software:

OMR software is a computer software application that makes OMR possible on a desktop computer by using an Image scanner to process surveys, tests, attendance sheets, checklists, and other plain-paper forms printed on a laser printer.OMR software is used to capture data from OMR sheets. While data capturing scanning devices focus on many factors like thickness of paper dimensions of OMR sheet and designing pattern.

History:

Optical mark recognition (OMR) is the scanning of paper to detect the presence or absence of a mark in a predetermined position. Optical mark recognition has evolved from several other technologies. In the early 19th century and 20th century patents were given for machines that would aid the blind. OMR is now used as an input device for data entry. Two early forms of OMR are paper tape and punch cards which use actual holes punched into the medium instead of pencil filled circles on the medium.

Paper tape was used as early as 1857 as an input device for telegraph. Punch cards were created in 1890 and were used as input devices for computers. The use of punch cards declined greatly in the early 1970s with the introduction of personal computers. With modern OMR, where the presence of a pencil filled in bubble is recognized, the recognition is done via an optical scanner.

Usage:

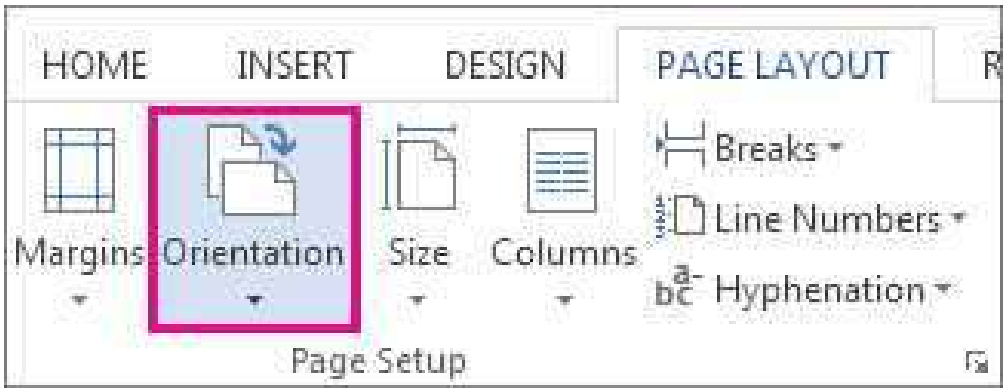
The use of OMR is not limited to schools or data collection agencies; many businesses and health care agencies use OMR to streamline their data input processes and reduce input error. OMR, OCR, and ICR technologies all provide a means of data collection from paper forms. OMR may also be done using an OMR (discrete read head) scanner or an imaging scanner.

Capabilities/requirements:

In the past and presently, some OMR systems require special paper, special ink and a special input reader (Bergeron, 1998). This restricts the types of questions that can be asked and does not allow for much variability when the form is being input. Progress in OMR now allows users to create and print their own forms and use a scanner (preferably with a document feeder) to read the information. The user is able to arrange questions in a format that suits their needs while still being able to easily input the data. OMR systems approach one hundred percent accuracy and only take 5 milliseconds on average to recognize marks. Users can use squares, circles, ellipses and hexagons for the mark zone. The software can then be set to recognize filled in bubbles, crosses or check marks.OMR can also be used for personal use. All-in-one printers in the market will print the photos the user selects by filling in the bubbles for size and paper selection on an index sheet that has been printed. Once the sheet has been filled in, the individual places the sheet on the scanner to be scanned and the printer will print the photos according to the marks that were indicated.

30. PAGE LAYOUT AND ORIENTATION IN WORD DOCUMENT

Different options available under page layout:



1. Click Portrait or Landscape.

When we change the orientation, the cover pages in the Cover Page gallery change to the orientation we've chosen.

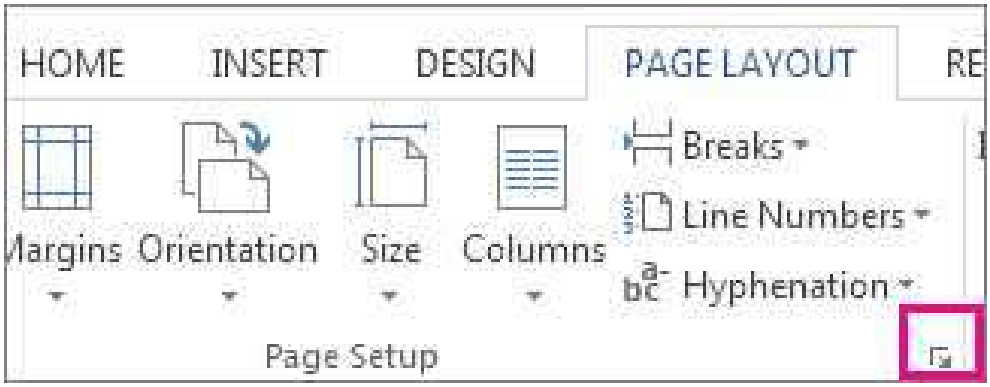
Use different orientations in the same document

There may be times when you want certain pages or sections of your document to have a different orientation from the rest of it. Word puts selected text on its own page, and the surrounding text on separate pages.

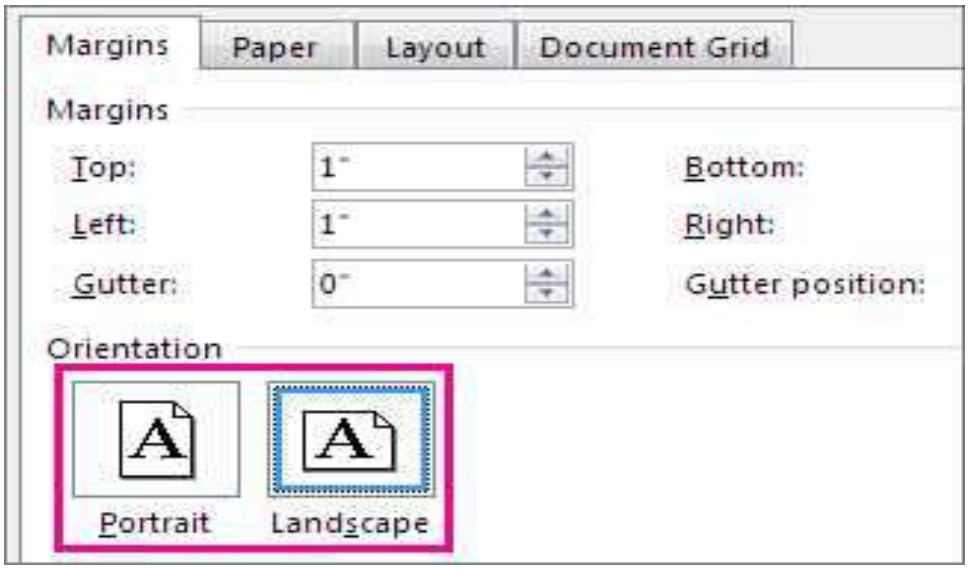
This option is not available when editing a document in Word Online.

2. Select the pages or paragraphs whose orientation you want to change.

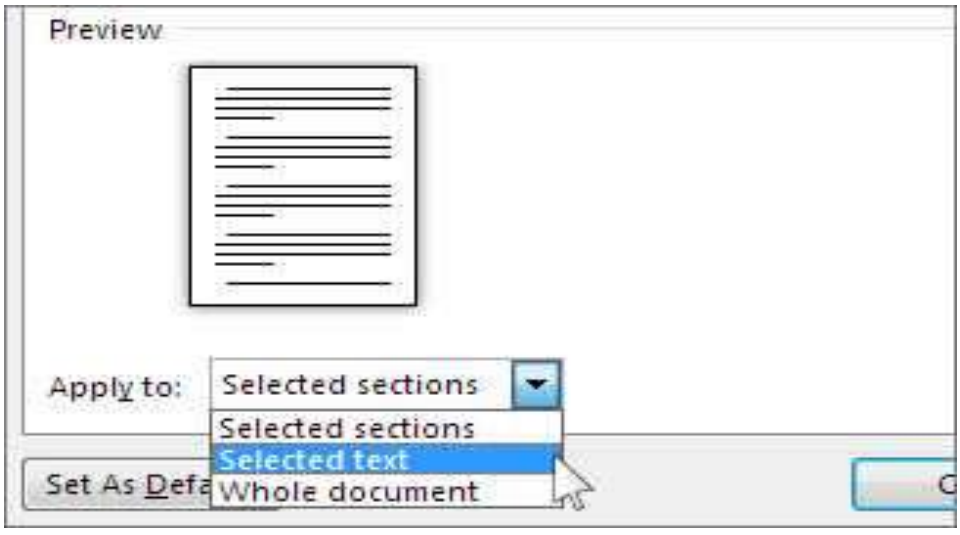
   Click Page Layout > Page Setup Dialog Box Launcher.



3. In the Page Setup box, under Orientation, click Portrait or Landscape.



4. Click the Apply to box and click selected text.



Word automatically inserts section breaks before and after the text that has the new page orientation.

If our document is already divided into sections, we can click in a section (or select multiple sections), and then change the orientation for only the sections that we select.

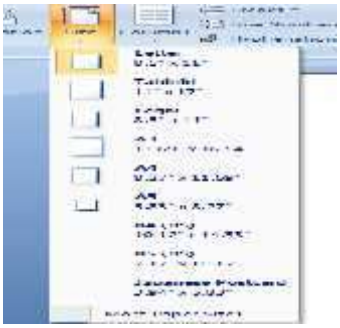
31. PAGE SIZES IN A WORD DOCUMENT

Page orientation:

Word offers two page orientation options:

1. Landscape and
2. Portrait.

- Landscape indicates that the page is oriented horizontally.
- Portrait indicates that the page is oriented vertically.



To change page orientation:

- Select the Layout tab.
- Click the Orientation command in the Page Setup group.
- A drop-down menu will appear.
- Click either Portrait or Landscape to change the page orientation.
- The page orientation of the document will be changed.

Page size:

By default, the page size of a new document is 8.5 inches by 11 inches. Depending on the project, we may need to adjust our document's page size.

To change the page size:

- Select the Layout tab, and then click the Size command.
- A drop-down menu will appear.
- The current page size is highlighted.
- Click the desired predefined page size.
- The page size of the document will be changed.

To use a custom page size:

- From the Layout tab, click Size.
- Select More Paper Sizes from the drop-down menu.
- The Page Setup dialog boxes will appear.
- Adjust the values for Width and Height
- Then click OK.
- The page size of the document will be changed.

Page margins:

A margin is the space between the text and the edge of the document. By default, a new document's margins are set to Normal, which means it has a one-inch space between the text and each edge.

To format page margins:

- Select the Layout tab, and then click the Margins command.
- A drop-down menu will appear.
- Click the predefined margin size that is needed.
- The margins of the document will be changed.

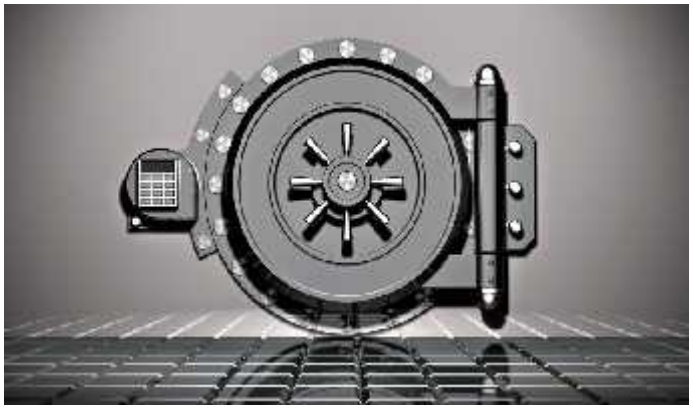
To use custom margins:

- From the Layout tab, click Margins
- Select Custom Margins from the drop-down menu.
- The Page Setup dialog box will appear
- Adjust the values for each margin
- Then click OK
- The margins of the document will be changed

32. PASSWORD AND ITS TYPES

Password:

A Password is a word or string of characters used for user authentication to provide identity or access approval to an access to resources, which is to be kept secret from those not allowed access.



Types:

Power on password:

A Power on password protects the system from being powered on by an unauthorized person.

This password prevents our system from being powered on by unauthorized users.

A prompt appears during system start up, and the correct password must be entered before the operating system boots.

Hard drive password:

There are two kinds of hard drive password:

- ✓ User
- ✓ Master.

The administrator of the system can access the hard drive even if the user hard drive has been changed.

Depending on our preference, we can set either a user only password, or master and user password, which requires two hard drive passwords.

- The system administrator keys in both in the same operator and can provide the user password to the laptop or desktop user.
- If a hard drive password has been set, a password prompt appears during the boot process.
- If the user forgets the hard drive password, check if a master hard drive password has been set to the system administrator can access the hard drive.
- If the master hard drive password is forgotten the hard drive must be replaced and this is not covered under warranty.

Supervisor password:

- The BIOS or Supervisor password protects the system information stores in the BIOS.
- A password is needed for the user to access the BIOS setup utility to change system configuration.
- If the supervisor password is forgotten, there is no way to reset it to enter the BIOS configuration.
- Setting a supervisor password automatically sets master hard drive password.

Operation system password:

Windows, Mac, Linux, etc... Tack Windows OS as an example.

We need to type the login password if we have created a Windows user account password. This feature helps to prevent other persons from personal information.

33. PAYTM

Paytm is an Indian electronic payment and e-commerce brand based out of Delhi NCR, India. Launched in August 2010, it is a consumer brand of parent company One97 Communications. The name is an acronym for “Payment through Mobile”. The company employs over 13,000 employees as of January 2017 and has 3 million offline merchants across India. It also operates the Paytm payment gateway and the Paytm Wallet. Among other sources of funding, in 2015, Paytm became the first Indian company to receive funding from Chinese e-commerce company Alibaba, after it raised over $625 million at a valuation of $1.5 billion.

Backround:

Paytm was founded and incubated by One97 Communications Limited in 2010 as a prepaid mobile recharge website. In an interview, its founder Vijay Shekhar Sharma related how he was inspired during a visit to China when he saw vegetable vendors using their mobile phones to receive payments from some customers.

This led to him establishing Paytm wallet in 2013. In 2013, the company launched Paytm Wallet, which became India's largest mobile payment service platform with over 150 million wallets and 75 million Android-based app downloads as of November 2016.

The surge in usage of the service was largely due to the demonetization of the 500 and 1000 rupee currency notes. After 8 November 2016, Paytm's transactions and profit increased significantly. Paytm has invested $5 million in auto rickshaw aggregator and hyper local delivery firm Jugnoo.

Payments bank:

In 2015, Paytm received a license from Reserve Bank of India to start one of India's first payments banks, called "Paytm Payments Bank Limited". At the time, the bank intended to use Paytm's existing user base for offering new services, including debit cards, savings accounts, online banking and transfers, on May 23, 2017, initially with invite only system. From August 31, 2017, the services of the bank were open to everyone through Paytm Android and iOS app.

Services and products:

Service is available through a browser, and an app is available on the Android, Windows and iOS operating systems. Paytm is also approved as an operating unit for integrated bill payment system Bharat Bill Payment System, allowing multiple payment modes for consumers.

Paytm wallet:

The Paytm Wallet application enables users to book air tickets and taxis, mobile recharge, and payment of DTH, broadband and electricity bills among others. The money transfer feature is only available for mobile users, not for desktop. Users can also pay for fuel at Petrol pumps and buy movie tickets at PVR Cinemas through the wallet.

34. PEOPLEWARE

Peopleware refers to the human role in an IT system. In many cases, Peopleware forms a kind of “conceptual triangle” with hardware and software. The term refers to human talent as a kind of commodified piece of an IT process and a key part of providing various technical business models and other planning resources. Peopleware is a term used to refer to one of the three core aspects of computer technology, the other two being hardware and software.

Computers operate using a combination of hardware and software. However, without user interaction, most computers would be useless machines. The neologism was first used by Peter G. Neumann in 1977 and independently coined by Meilir Page-Jones in 1980 and was popularized in the book Peopleware: Productive Projects and Teams by Tom DeMarco and Timothy Lister in 1987. The term "Peopleware" also became the title and subject matter of a long-running series of columns by Larry Constantine in Software Development magazine, later compiled in book form.

Peopleware and social business:

The idea of a process-based "architecture" for trust and transparency sounds very valuable for two reasons. Firstly, creating an alternative approach to creating trust and solving organizational and relationship friction via Peopleware, instead of software, offers a new way to solve previously intractable problems. Although the idea of Peopleware has been around for about 30 years, not much has changed.

Categories of Peopleware:

- Organizational factors
- Project Management
- Group Dynamics
- Teamwork
- Developer Productivity and the Psychology of Programming
- Human-Machine Interaction

Role of Peopleware:

Process-oriented, management-centric corporate ideologies need to be transformed into people-oriented, or a management less way of organizing businesses. Without such a transition there is no way to establish autonomy, trust and transparency for employees. These traits are a prerequisite for building environments where people love their work! It's going to be interesting to watch the changing role of Peopleware in social business, not least the idea of what Peopleware is and how it can help social business realize its full, transformative potential.

Examples of Peopleware:

- Computer Engineer
- Software Engineer
- Information Technology Specialists
- Web Designer
- Computer Technician

35. PERMALINKS

A permalink or permanentlink is a URL that is intended to remain unchanged for many years into the future, yielding a hyperlink that is less susceptible to link rot. Permalinks are often rendered simply, that is, as friendly URLs, so as to be easy for people to type and remember.

Presentation:

Blog entries are usually laid out as follows:

- Title
- Date
- Entry
- Comments, permalink, and what category the entry was posted to (known as metadata)

Permalinks are usually denoted by text link (i.e. "Permalink" or "Link to this Entry"), but sometimes a symbol may be used. The most common symbol used is the hash sign, or #. However, certain websites employ their own symbol to represent a permalink such as an asterisk, a dash, a pilcrow (¶), a section sign (§), or a unique icon.

Permalink detection:

Permalinks can be indicated within the HTML of a page so as to allow automated browsing tools to detect the permalink and use it for linking instead of the stated URL. The link element should include the following attributes:

link rel="bookmark" href="http://example.com/bookmark/123/" />

Purpose:

Permalinks as the permanent URLs to user individual pages and blog posts, as well as user category and tag archives. A permalink is the web address used to link to your content. The URL to each post should be permanent, and never change hence the name permalink.

Advantage:

Visitors who store the URL for a particular entry often find upon their return that the desired content has been replaced by something new. Prominently posting permalinks is a method employed by bloggers to encourage visitors to store a more long-lived URL (the permalink) for reference.

Disadvantage:

Crucially, if an item is changed, renamed, or moved within the internal database, its permalink remains unaltered, but if an item is deleted altogether, its permalink can frequently not be reused.

36. PHOBIAS RELATED TO COMPUTER DEVICES

Technophobia is the fear or dislike of advanced technology or complex devices, especially computers. Although there are numerous interpretations of technophobia, they seem to become more complex as technology continues to evolve. The term is generally used in the sense of an irrational fear, but others contend fears are justified. It is related to cyberphobia and is the opposite of technophilia. Dr. Larry Rosen, research psychologist, computer educator, and professor at the California State University suggests that there are three dominant subcategories of technophobes- the "uncomfortable users", the "cognitive computerphobes", and "anxious computerphobes".

First receiving widespread notice during the Industrial Revolution, technophobia has been observed to affect various societies and communities throughout the world. This has caused some groups to take stances against some modern technological developments in order to preserve their ideologies. In some of these cases, the new technologies conflict with established beliefs, such as the personal values of simplicity and modest lifestyles.

Prevalence:

A study published in the journal computers in human behavior was conducted between 1992 and 1994 surveying first-year college students across various countries. The overall percentage of the 3,392students who responded with high-level technophobic fears was 29%.In comparison, Japan had 58% high-level technophobes, India had 82%, and Mexico had 53%.

History:

Technophobia began to gain national and international attention as a movement with the dawn of the Industrial Revolution. With the development of new machines able to do the work of skilled craftsmen using unskilled, underpaid men, women, and children, those who worked a trade began to fear for their livelihoods. In 1675, a group of weavers destroyed machines that replaced their jobs. By 1727, the destruction had become so prevalent that Parliament made the demolition of machines a capital offense. This action, however, did not stop the tide of violence.

The Luddites, a group of anti-technology workers, united under the name “Ludd” in March 1811, removing key components from knitting frames, raiding houses for supplies, and petitioning for trade rights while threatening greater violence. Poor harvests and food riots lent aid to their cause by creating a restless and agitated population for them to draw supporters from. The 19th century was also the beginning of modern science, with the work of Louis Pasteur, Charles Darwin, Gregor Mendel, Michael Faraday, Henri Becquerel, and Marie Curie, and inventors such as Nikola Tesla, Thomas Edison and Alexander Graham Bell. The world was changing rapidly, too rapidly for many, who feared the changes taking place and longed for a simpler time. The Romantic movement exemplified these feelings. Romantics tended to believe in imagination over reason, the “organic” over the mechanical, and a longing for a simpler, more pastoral time. Poets like William Wordsworth and William Blake believed that the technological changes that were taking place as a part of the industrial revolution were polluting their cherished view of nature as being perfect and pure. After World War II, a fear of technology continued to grow, catalyzed by the bombings of Hiroshima and Nagasaki. With nuclear proliferation and the Cold War, people began to wonder what would become of the world now that humanity had the power to manipulate it to the point of destruction. Corporate production of war technologies such as napalm, explosives, and gases during the Vietnam War further undermined public confidence in technology's worth and purpose. In the post-WWII era, environmentalism also took off as a movement. The first international air pollution conference was held in 1955, and in the 1960s, investigations into the lead content of gasoline sparked outrage among environmentalists. In the 1980s, the depletion of the ozone layer and the threat of global warming began to be taken more seriously.

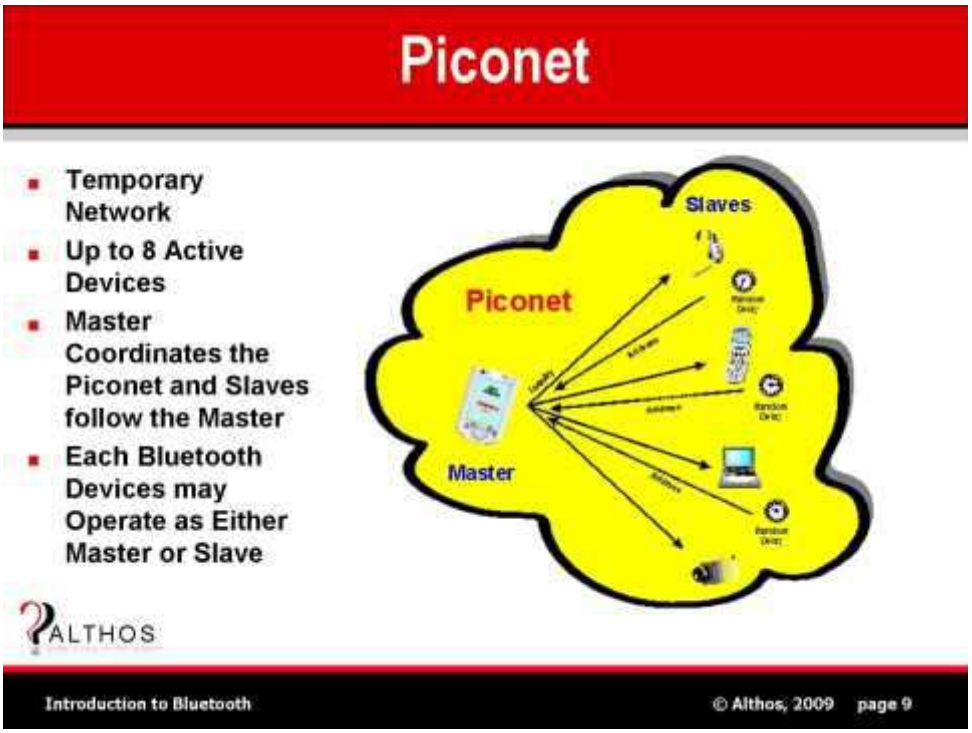
Luddites:

Several societal groups may be considered technophobic, most recognizable are the Luddites. Many technophobic groups revolt against modern technology because of their beliefs that these technologies are threatening their ways of life and livelihoods. The Luddites were a social movement of British artisans in the 19th century who organized in opposition to technological advances in the textile industry. These advances replaced many skilled textile artisans with unskilled machine operators, that impacted the structure of their established trades, or the general nature of the work itself.

37. PICONET

A network of devices connected in an ad hoc fashion using Bluetooth technology. A piconet is formed when at least two devices, such as a portable PC and a cellular phone, connect. A piconet can support up to eight devices. When a piconet is formed, one device acts as the master while the others act as slaves for the duration of the piconet connection. A piconet is sometimes called a PAN.

"Piconet" is a combination of the prefix "pico," meaning very small or one trillionth, and network.

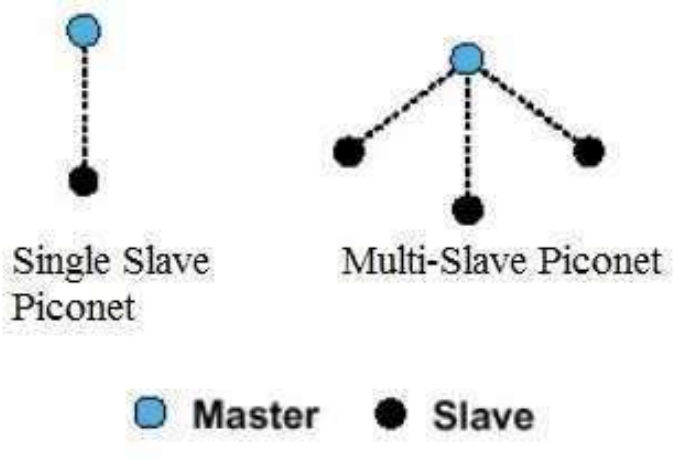


Up to 8 active Bluetooth devices can form or become part of temporary small networks Piconets. Bluetooth allows wireless data connections within the Piconet to be dynamically added and removed between nearby devices. Because the Bluetooth system hops over 79 channels, the probability of interfering (overlapping) with another Bluetooth system is less than 1.5%. This allows several Bluetooth Piconets to operate in the same area at the same time with minimal interference. Bluetooth communication always designates one of the Bluetooth devices as a main controlling unit - master unit. Other devices that follow the master unit are slave units. This allows the Bluetooth system to be non-contention based (no collisions).

This means that after a Bluetooth device has been added to the temporary network (the Piconet), each device is assigned a specific time period to transmit and they do not collide or overlap with other units operating within the same Piconet.

Piconets can be setup to interact with other Piconets to form larger networks called Scatternets. Scatternets allow the master in one Piconet to operate as a slave in another Piconet. While this allows Bluetooth devices in one Piconet to communicate with devices in another Piconet (cross-Piconet communication), the use of Scatternets requires synchronization (and sharing of data transmission Bandwidth) making them less efficient.

Bluetooth Piconet:



Difference between Piconet and Scatternet:

Piconet	Scatternet
In this Bluetooth network, device can function either as master or slave.	In this Bluetooth network, device can function as master or slave or (master+slave)
It serves smaller coverage area.	It serves larger coverage area.
It supports maximum 8 nodes.	It supports more than 8 nodes.
It allows less efficient use of available Bluetooth channel bandwidth.	It allows more efficient use of available Bluetooth channel bandwidth.

38. PINTEREST

Development of Pinterest began in December 2009, and the site launched as a closed beta in March 2010. The site proceeded to operate in invitation-only open beta. Pinterest allows users to save images and categorize them on different boards. They can follow other users' boards if they have similar tastes.

The evolution of Pinterest is based on the shared interest of its users and relies on its members to produce the content. The most popular categories, as of March 2012, were home, arts and crafts, style/fashion, and food. Silbermann said he personally wrote to the site's first 5,000 users offering his personal phone number and even meeting with some of its users.

Pinterest's early growth wasn't as Silbermann has expected. Four months after being launched, Pinterest only had a few thousand users, compared to Instagram which had about 1 million users after that same amount of time.

Growth:

At the South by Southwest Interactive conference in March 2012, Silbermann announced revamped profile pages were being developed and would be implemented soon.

On 23 March 2012, Pinterest unveiled updated terms of service that eliminated the policy that gave it the right to sell its users' content. The terms would go into effect April 6.

Acquisitions:

In March 2013, Pinterest acquired Livestar. Terms were not disclosed. In early October 2013, Pinterest acquired Hackermeter. The company’s co-founders, Lucas Baker and Frost Li, joined Pinterest as engineers. In late October 2013, Pinterest secured a $225 million round of equity funding that valued the website at $3.8 billion.

In April 2015, Pinterest acquired the team from Hike Labs, which had been developing a mobile publishing application called Drafty.

Purpose:

Pinterest is a free website that requires registration to use. Users can upload, save, sort, and manage images known as pins and other media content (e.g., videos) through collections known as pinboards.

Content can also be found outside of Pinterest and similarly uploaded to a board via the "Pin It" button, which can be downloaded to the bookmark bar on a web browser, or be implemented by a webmaster directly on the website.

Business pages:

Pinterest also allows businesses to create pages aimed at promoting their companies online. Such pages can serve as a "virtual storefront."

In one case study of a fashion website, users visiting from Pinterest spent $180 compared to $85 spent from users coming from Facebook. These users spent less time on the company's website, choosing instead to browse from the company's pinboard. Further brand studies have continued to show Pinterest is more effective at driving sales than other forms of social media. A study carried out by Wolfgang Digital found that site traffic originating from Pinterest Business pages was more engaged spending up to five times longer on site.

Demographics:

Globally, the site is most popular with women. In 2012, a report found that 83% of the global users were women. Britain, however, is an exception. As of March 2012, 56% of the users were male and their age profile was different too, being about 10 years younger than in the U.S., where the predominant age range was typically 35–44. In terms of age distribution, the Pinterest demographic closely resembles the U.S. Internet population.

Pins:

A Pin is an image that has been uploaded or linked from a website. Pins saved from one user's board can be saved to someone else's board, a process known as "repinning." In 2016, Pinterest renamed the "Pin it" button to "Save."

39. PIXEL

A pixel (short for picture element, using the common abbreviation "pix" for "picture") is one of the many tiny dots that make up the representation of a picture in a computer's memory. Each such information element is not really a dot, nor a square, but an abstract sample. Pixels in an image can be reproduced at any size without the appearance of visible dots or squares; but in many contexts, they are reproduced as dots or squares and can be visibly distinct when not fine enough. The intensity of each pixel is variable; in color systems, each pixel has typically three or four dimensions of variability such and Red, Green and Blue, or Cyan, Magenta, Yellow and Black.

Technical:

A pixel is generally thought of as the smallest complete sample of an image. The definition is highly context sensitive. For example, we can speak of pixels in a visible image (e.g. a printed page) or pixels carried by one or more electronic signal(s), or represented by one or more digital value(s), or pixels on a display device, or pixels in a digital camera (photo sensor elements). This list is not exhaustive and depending on context there are several synonyms which are accurate in particular contexts, e.g. pel, sample, bytes, bits, dots, spots, superset, triad, stripe set, window, etc. We can also speak of pixels in the abstract, in particular when using pixels as a measure of resolution, e.g. 2400 pixels per inch or 640 pixels per line. Dots is often used to mean pixels, especially by computer sales and marketing people, and gives rise to the abbreviation DPI or dots per inch.

The more pixels used to represent an image, the closer the result can resemble the original. The number of pixels in an image is sometimes called the resolution, though resolution has a more specific definition. Pixels can be expressed as a single number, as in a "three-megapixel" digital camera, which has a nominal three million pixels, or as a pair of numbers, as in a "640 by 480 display", which has 640 pixels from side to side and 480 from top to bottom (as in a VGA display), and therefore has a total number of 640 × 480 = 307,200 pixels. The colour samples that form a digitized image (such as a JPG file used on a web page) are also called pixels. Depending on how a computer displays an image, these may not be in one-to-one correspondence with screen pixels.

In areas where the distinction is important, the dots in the image file may be called texels. In computer programming, an image composed of pixels is known as a bitmapped image or a raster image. The word raster originates from analogue television technology. Bitmapped images are used to encode digital video and to produce some types of computer-generated art.

Native vs. logical pixels:

Since the resolution of most computer displays can be adjusted from the computer's operating system, a display's pixel resolution may not be an absolute measurement.

Modern LCD computer displays are designed with a native resolution which refers to the perfect match between pixels and triads. (CRT displays also use red-green-blue phosphor triads, but these are not coincident with image pixels, and cannot therefore be said to be equivalent to pixels.)

The native resolution will produce the sharpest picture capable from the display. However since the user can adjust the resolution, the monitor must be capable of displaying other resolutions. Non-native resolutions have to be supported by approximate resembling in the LCD screen, using interpolation algorithms. This often causes the screen to look jagged or blurry. For example, a display with a native resolution of 1280×1024 will look best set at 1280×1024 resolution, will display 800×600 adequately by drawing each pixel with more physical triads, and may be unable to display in 1600×1200 at all due to the lack of physical triads.

Pixels can be either rectangular or square. A number called the aspect ratio describes the squareness of a pixel. For example, a 1.25:1 aspect ratio means that each pixel is 1.25 times wider than it is high. Pixels on computer monitors are usually square, but pixels used in digital video have non-square aspect ratios, such as those used in the PAL and NTSC variants of the CCIR 601 digital video standard, and the corresponding anamorphic widescreen formats.

Each pixel in a monochrome image has its own brightness. Zero usually represents black, and the maximum value possible represents white. For example, in an eight-bit image, the maximum unsigned value that can be stored by eight bits is 255, so this is the value used for white.

40. POST OFFICE PROTOCOL (POP)

What does POP Email mean?

POP (Post Office Protocol) is an internet standard that defines an email server (the POP server) and a way to retrieve mail from it (using a POP client).

What does POP3 mean?

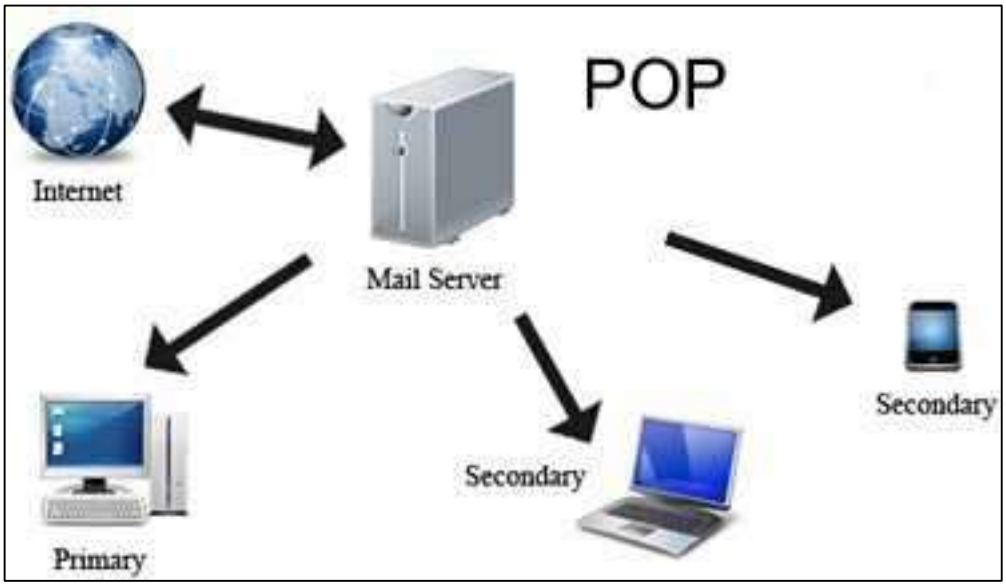
The Post Office Protocol has been updated 2 times since it was first published. A rough history of POP is

POP: Post Office Protocol (POP1); published 1984

POP2: Post Office Protocol – Version 2; published 1985 and

POP3: Post Office Protocol – Version 3, published 1988.

So, POP3 means "Post Office Protocol – Version 3". This version includes mechanisms to expand the protocol for new actions and, for example, authentication mechanisms. Since 1988, these have been used to update the Post Office Protocol, and POP3 is still the current version.



How does POP work?

Incoming messages are stored at a POP server until the user logs in (using an email client and downloads the messages to their computer.

While SMTP is used to transfer email messages from server to server, POP is used to collect mail with an email client from a server.

How does POP compare to IMAP?

POP is the older and much simpler standard. While IMAP allows for synchronization and online access, POP defines simple commands for mail retrieval. Messages are stored and dealt with locally on the computer or device alone. POP is therefore easier to implement and typically more reliable and stable.

SIs POP also for sending mail?

The POP standard defines commands to download emails from a server. It does not include means to send messages. For sending email, SMTP (Simple Mail Transfer Protocol) is used.

Does POP have disadvantages?

POP's virtues are also some of its disadvantages. POP is a limited protocol that lets your email program do nothing but download messages to the computer or device, with an option to keep a copy on the server for future download.

While POP lets, email programs keep track of which messages have been fetched already, sometimes this fails and messages may be downloaded again.

With POP, it is not possible to access the same email account from multiple computers or devices and have actions synchronize between them.

Where is POP defined?

The principal document to define POP (qua POP3) is RFC (Request For Comments) 1939 from 1996.

41. PRIMARY KEY

Introduction:

Key plays an important role in database management system. It is used for identifying unique rows from table. It also establishes relationship among tables. A primary key is a special relational database table column (or combination of columns) designated to uniquely identify all table records. It is a column or set of columns in a table that uniquely identifies tuples (rows) in that table.

Features:

A primary key's features are, it must contain a unique value for each row of data and cannot contain null values.

Databases depend upon keys to store, sort, and compare or create relationships between records. If we've been around databases for a while, we've probably heard about different types of keys: primary keys, candidate keys, and foreign keys. When we create a new database table, we're asked to select one primary key that will uniquely identify each record stored in that table.

Why a primary key is important?

The selection of a primary key is one of the most critical decisions we will make in the design of any type of new database. The most important constraint is that we must ensure that selected key is unique. If it is possible that two records are in the past, present or future, may share the same value for an attribute, it is a poor choice for a primary key. Another important aspect of a primary key is its use by other tables that link to it in a relational database. In this aspect, a primary key acts like the target of a pointer. Because of these interdependencies, a primary key must exist when a record is created, and it can never change.

Tips for choosing good primary keys:

- ✓ Keep it shortbecause the primary key is used for lookups and comparisons, a short primary key means the database management system can process it more quickly than a long primary key.
- ✓ Use a numberfor the primary key whenever possible. SQL Server or other database management systems process number data types faster than character data types.
- ✓ Keep it simpledon't use any special characters, embedded spaces, or a mix of upper and lower capitalization.
- ✓ Never change the primary key after you assign it.

Poor choices for primary keys:

- ✓ PIN or ZIP codesdo not make good primary keys for a table of towns. If we are making a simple lookup table of cities, PIN or ZIP codes seem to be a logical primary key. However, upon further investigations, we may realize that that more than one town shares a PIN or ZIP code.
- ✓ Social Security numbers do not make good primary keys for many reasons. Most people consider their SSN to be private and do not want it clearly visible to database users. Some people don't have like foreigners or immigrants who have never received a Social Security card.
- ✓ Email addressesare also a poor choice for a primary key. Although they are unique, they can change over time. Furthermore, not everyone has an email address.

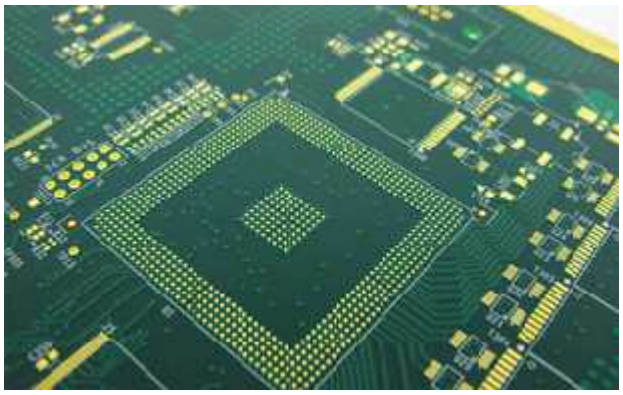
Choosing an effective primary key:

A best practice in database design is to use an internally generated primary key. Our database management system can normally generate a unique identifier that has no meaning outside of the database system. A good primary key is usually short, uses numbers, and avoids special characters or a mix of uppercase and lowercase characters to facilitate rapid database lookups and comparisons.

42. PRINTED CIRCUIT BOARD (PCB)

Introduction:

A Printed Circuit Board (PCB) mechanically supports and electrically connects electronic components or electrical components using conductive tracks, pads and other features etched from one or more sheet layers of copper laminated onto and/or between sheet layers of a non-conductive substrate. Printed Circuit Boards are used in all but the simplest electronic products. They are also used in some electrical products, such as passive switch boxes.



Components are generally soldered onto the PCB to both electrically connect and mechanically fasten them to it. The "card" is made of a material that does not conduct electricity, like fiberglass or plastic. Usually copper is etched inside the board between the layers of plastic, or on the surface of the board. This makes the electricity go only where it is wanted.

Design:

The main task in designing a PCB is figuring out where all the components are going to go. There is no such thing as a standard printed circuit board. Each board is designed for its own use and must be the right size to fit the required space. Board designers use computer-aided design software to layout the circuit designs on the board. The spaces between electrical paths are often 0.04 inches (1.0 mm) or smaller.

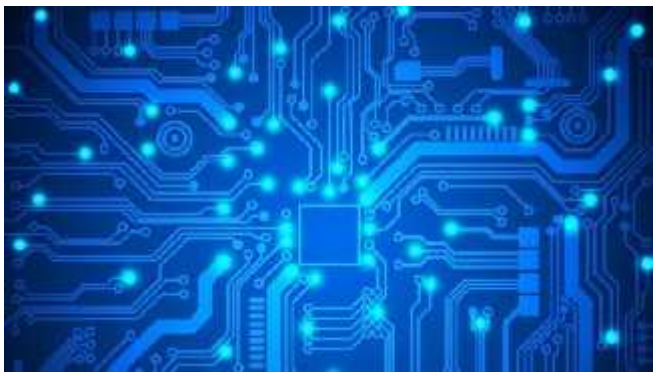
Once the circuit pattern is laid out, a negative image is printed out at exact size on a clear plastic sheet. With a negative image, the areas that are not part of the circuit pattern are shown in black and the circuit pattern is shown as clear. This design is made into instructions for a computer-controlled drilling machine or for the automatic solder paste used in the manufacturing process.

Manufacturing:

The card is made with outer layers of copper. Unwanted copper is removed, leaving copper wires that will connect the electronic components. The components are placed on the board, making contact with the wires.

Photo resist:

Circuit boards are sometimes made with photolithography. A covering called photo resist reacts with light, and then the circuit board and covering are put in a developer. This method is expensive per board, but very cheap to set up in the beginning.



Silkscreen:

There are, however, different methods of making a circuit board. Some professionally made circuit boards use a different method to remove extra copper from the circuit board. A process called silk screen printing is used. Silk-screening is when a cloth is pulled tight over a frame. Then an image is printed onto the cloth. Then ink is pressed through the cloth. The ink does not go where the image has been printed on the cloth. It is called silk-screening because the cloth is usually silk. The cloth is usually silk because it has very small holes. Resist is an ink that resists the etchant used to make the circuit board. Etchant dissolves the copper on the board. This is cheaper for each board than photo-resist, but is more expensive in the beginning.

Milling:

A mill is a drill that moves in many directions. The drill removes a small amount of copper each time it moves. The mill removes the copper around the wires on the board. This leaves extra copper on the board. This method is cheaper per board, but the equipment to make it is expensive. This method is not used often, because the other two methods are easier.

43. SHAREIT

Introduction:

SHAREit is a free application to transfer files from a Wi-Fi compatible device to another similar one. It is an application developed by Lenovo that allows Windows, Windows Phone, Android, and iOS devices to transfer files directly by ad-hoc Wi-Fi connections.

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It is possible to share files and folders among smart phones, tablets, and personal computers. It is currently available in 39 languages including English, French, Spanish, Russian, Arabic, Hindi and Chinese.

Specification:

It was first launched In China and known as anyshare. In transfer field, SHAREit competes with Xender, Zapya, Share Apps, SuperBeam. In addition to transferring files, SHAREit's services also include CONTROL and CLONEit.

The app offers faster speed than Bluetooth and even NFC, and it is totally secure, considering the type of connection it uses to transfer files. It can complete the file transfer process at speeds approximately up to 200 times faster than Bluetooth.

Remote sensor:

The SHAREit site also talks about the ability to stream photos from an Android device to a PC, or use an Android device to control a PowerPoint presentation. We couldn't get either of these to work and the very basic documentation didn't help, but fortunately SHAREit's file sharing abilities are more than enough to justify the download.

Wi-Fi direct:

Wi-Fi Direct works as the same way we get connected to our Wi-Fi router to connect with internet. Wi-Fi Direct is faster than Bluetooth by more than 10 times.

When we try to share a file between two mobile phones, the sender phone's tethering will be turned on automatically and it get connected the receiver phone to share the file through Wi-Fi Direct.

The devices going to transfer the files must have a Wi-Fi functionality. [Only Wi-Fi, no data connection required]. To begin transferring the files between one device to another, all you need is the SHAREit application installed on both the devices. We can download the SHAREit app for PC to use in windows.

This is the fastest and most convenient application used for the sharing of photographs, videos, apps and any file that is saved on the computer. SHAREit for PC does not require the usage of any cables or wires for the purpose, and neither does it need any internet connection for the same. It is convenient for the users who juggle between multiple devices and need data to be transferred every now and then.

The application detects devices with the same application when in range, and does not suck on the battery too much as well. It is possible to integrate up to five devices at the same time for group sharing with family and friends; this does effect the speed of the sharing, but only to a certain extent. The interface of the application is seamless and intuitive, making it easy for the user to set it up and use it. SHAREit for PC can be downloaded.

44. SQL * PLUS ENVIRONMENT

SQL*plus Overview:

SQL*Plus is an interactive and batch query tool that is installed with every Oracle Database installation. It has a command-line user interface, a Windows Graphical User Interface (GUI) and the iSQL*Plus web-based user interface.

There is also the SQL*Plus Instant Client which is a stand-alone command-line interface available on platforms that support the OCI Instant Client. SQL*Plus Instant Client connects to any available Oracle database, but does not require its own Oracle database installation. See the Oracle Call Interface Programmer's Guide for more information on the OCI Instant Client.

SQL*Plus has its own commands and environment, and it provides access to the Oracle Database. It enables us to enter and execute SQL, PL/SQL, SQL*Plus and operating system commands to perform the following:

- ✓ Format, perform calculations on, store, and print from query results
- ✓ Examine table and object definitions
- ✓ Develop and run batch scripts
- ✓ Perform database administration

Who can use SQL*plus?

The SQL*Plus, SQL, and PL/SQL command languages are powerful enough to serve the needs of users with some database experience, yet straightforward enough for new users who are just learning to work with the Oracle Database. The SQL*Plus language is easy to use.

SQL*Plus environment:

SQL*Plus is an environment designed as a command line interface between the database and the user. SQL*Plus can execute the SQL commands and SQL*Plus commands.

SQL*Plus commands are not the same as SQL commands. As discussed previously, SQL commands are used to create and modify tables (DDL), manipulate data (DML) and manage database security (DCL). SQL*Plus commands, however, are specific to the SQL*Plus environment and are used for formatting output and operational control. They are useful, for example, in creating formatted output in a report. SQL commands are terminated by a semicolon, SQL*Plus commands are not. SQL and SQL*Plus commands can be submitted as ad hoc queries by entering one command at a time. They can also be executed via a command file, using a text editor such as Notepad. In this case the command file can contain many SQL and SQL*Plus commands. We will be looking at both of these methods.

Data Definition Language (DDL):

Each entity is converted into a database table by use of the Data Definition Language (DDL) component of SQL. This component of the SQL language allows you to create, remove and modify tables in a relational database.

There are three main DDL commands for managing tables:

- CREATE TABLE tablename to create a table in the database
- DROP TABLE tablename to remove a table from the database
- ALTER TABLE tablename to add or remove columns from a table in the database

Use the CREATE and DROP commands to create and remove other objects in the database. Later, we will be using these commands for creating and removing objects called views, indexes and synonyms.

45. SQL SERVER

MS SQL Server:

MS SQL Server is a relational database management system (RDBMS) developed by Microsoft. This product is built for the basic function of storing retrieving data as required by other applications. It can be run either on the same computer or on another across a network. This tutorial explains some basic and advanced concepts of SQL Server such as how to create and restore data, create login and backup, assign permissions, etc. Each topic is explained using examples for easy understanding.

What is SQL Server?

It is a software, developed by Microsoft, which is implemented from the specification of RDBMS. It is also an ORDBMS. It is platform dependent. It is both GUI and command based software. It supports SQL (SEQUEL) language which is an IBM product, non-procedural, common database and case insensitive language.

Usage of SQL Server:

- ✓ To create databases.
- ✓ To maintain databases.
- ✓ To analyze the data through SQL Server Analysis Services (SSAS).
- ✓ To generate reports through SQL Server Reporting Services (SSRS).
- ✓ To carry out ETL operations through SQL Server Integration Services (SSIS).

Architecture:

The protocol layer implements the external interface to SQL Server. All operations that can be invoked on SQL Server are communicated to it via a Microsoft-defined format, called Tabular Data Stream (TDS). TDS is an application layer protocol, used to transfer data between a database server and a client. Initially designed and developed by Sybase Inc.

It has been classified as the architecture of SQL Server into the following parts for easy understanding: General architecture, Memory architecture, Data file architecture, Log file architecture.

Checkpoints in SQL Server:

Automatic:This is the most common checkpoint which runs as a process in the background to make sure SQL Server Database can be recovered in the time limit defined by the Recovery Interval - Server Configuration Option.

Indirect: This is new in SQL Server 2012. This also runs in the background but to meet a user-specified target recovery time for the specific database where the option has been configured. Once the Target Recovery Time for a given database has been selected, this will override the Recovery Interval specified for the server and avoid automatic checkpoint on such DB.

Manual: This one runs just like any other T-SQL statement, once you issue checkpoint command it will run to its completion. Manual checkpoint runs for your current database only. We can also specify the Checkpoint duration which is optional.

Internal: As a user, we can't control internal checkpoint. Issued on specific operations such as

- ✓ Shutdown initiates a checkpoint operation on all databases except when shutdown is not clean (shutdown with no wait).
- ✓ If the recovery model get changed from Full\Bulk-logged to Simple.
- ✓ While taking backup of the database.
- ✓ If our DB is in simple recovery model, checkpoint process executes automatically either when the log becomes 70% full, or based on Server option-Recovery Interval.
- ✓ Alter database command to add or remove a data\log file also initiates a checkpoint.
- ✓ Checkpoint also takes place when the recovery model of the DB is bulk-logged and a minimally logged operation is performed.
- ✓ DB Snapshot creation.

Lazy Writer Process: Lazy writer will push dirty pages to disk for an entirely different reason, because it needs to free up memory in the buffer pool. This happens when SQL server comes under memory pressure. If Lazy Writer is always active, it could indicate memory bottleneck.

We express our sincere Gratitude for all those who have helped us, for the successful launch of this book, which is one of the Best Practices of our Department ....